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Universidad del País Vasco
Euskal Herriko Unibertsitatea

EuroSoTL19

June 13-14th 2019 • Bilbao

Ikaskuntza-irakaskuntza akademikoaren eremu berriak arakatzen

Explorando nuevos campos a través de un enfoque académico de la enseñanza y el aprendizaje

Exploring new fields through the scholarship of teaching and learning

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III EuroSoTL Kongresua

2019ko ekainak 13 eta 14
Bilbo, Euskal Herria

3rd EuroSoTL Conference

June 13-14, 2019
Bilbao, Basque Country

III Congreso EuroSoTL

13-14 de junio de 2019
Bilbao, País Vasco

eman ta zabal zazu

Universidad del País Vasco
Euskal Herriko Unibertsitatea

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Aurkibidea - Table of contents - Índice

1. Sarrera - Foreword – Introducción 4
2. Kongresuaren antolatzaileak – Conference Organizers – Organizadores del Congreso 8
3. Batzordeak eta laguntzaileak – Committees and volunteers – Comités y voluntarios 17
4. Hizlari gonbidatuak – Invited speakers – Ponentes invitados/as 19
5. The Joanna Renc – Roe Award 31
6. Programa - Programme 33
7. Ekarpenak – Contributions - Contribuciones 42

Hasierako hitzaldia – Opening conference – Conferencia de apertura:
Proyectos de innovación y premios a la calidad docente universitaria: su contribución al desarrollo institucional docente (Mònica Feixas) 44

Aldibereko saioak – Parallel sessions – Sesiones paralelas 54

T1. Azterketaren eta ikerketaren garapena graduko eta graduondoko ikasleetan / Developing inquiry and research in undergraduate and post-graduate students / El desarrollo de la indagación y de la investigación en estudiantes de grado y postgrado 55

T2. Ikasleen inplikazioa bultzatzen duten esperientziak (Student Engagement) / Experiences that stimulate student engagement / Experiencias que estimulan la implicación del alumnado (Student Engagement) 126

T3. Gero eta ugariagoak diren esperientzia berriak, ikaskuntza sakona eta esanguratsua sustatzen dutenak / Emerging and unpublished experiences that foster significant and deep learning / Experiencias emergentes e inéditas que propician aprendizaje profundo y significativo 304

T4. Ikaskuntzaren eta irakaskuntzaren ikuspegi profesionala irakasleen garapen profesionala garatzeko helburu gisa / The professional approach to teaching and learning as the objective of the professional development of academic staff / El Enfoque profesional de la enseñanza y el aprendizaje como objetivo del desarrollo profesional del profesorado 401

T5. SoTL eta Garapen Jasangarrirako Helburuak (Agenda 2030) / SoTL and the Sustainable Development Goals (2030 Agenda) / SoTL y los Objetivos de Desarrollo Sostenible (Agenda 2030) 580

Posterrak – Posters 692

1
Sarrera / Foreword / Introducción

Ongi etorri – Welcome – Bienvenidos/as

Universidad del País Vasco/Euskal Herriko Unibertsitateak ongi etorria ematen dizu EuroSoTL-en hirugarren ediziora. EuroSoTL Scholarship of Teaching and Learning-en Europako Biltzarra da, irakaskuntzaren eta ikaskuntzaren ikuspegi akademikoarena. 2019ko ekainaren 13an eta 14an izango da. Biltzarra International Society for Scholarship of Teaching and Learning —ISSOTL— elkartearekin eta RED-U Unibertsitateko Irakaskuntzako Estatuko Sarearekin lankidetzan antolatu da. Biltzarra Euskadin izango da. Euskadi, Europako hizkuntzarik zaharrena hitz egitea altxor duen herrialde txikia da, kultura identitate berezikoa. Bilboko Bizkaia Aretoan batu gara, hiriaren erdigunean. Eraikinak hainbat areto eta espazio ditu parte hartzaileek inguruneaz gozatzeko, Goi mailako Hezkuntzan irakaskuntzari eta ikaskuntzari buruzko gai berriak eztabaidatzeko eta esperientziak trukatzeko. Aurretik Cork-en (Irlanda, 2015) eta Lund-en (Suedia, 2017) ospatu da. Biltzar berri honen bidez, Irakaskuntzaren eta Ikaskuntzaren Ikuspegi Akademikoa (SoTL) Espainiako estatuan eta Latinoamerikan zabaldu eta ezagutarazi nahi da, eta aldiberean, Goi Mailako Hezkuntzaren berrikuntzan lan egiten duten zientzia elkarteei topagunea eskaini nahi zaie.

* * *

The University of the Basque Country/Euskal Herriko Unibertsitatea is pleased to be hosting EuroSoTL, the European Conference of Scholarship of Teaching and Learning on 13 and 14 June 2019. The conference is organised jointly with the European group of the International Society for Scholarship of Teaching and Learning —ISSOTL— and the Spanish Network of University Teaching —RED-U—. The conference will be held in the Basque Country, which is small in size but its treasures include speaking Europe's oldest language and its own cultural identity. The conference will be held in Bilbao, at Bizkaia Aretoa, which is lo-

cated in the city centre and has rooms and spaces where the participants will be able to enjoy the setting, discuss new topics on teaching and learning in Higher Education and share experiences. After the previous two held in Cork, Ireland (2015) and Lund, Sweden (2017), the 2019 conference seeks to open up the way for Scholarship of Teaching and Learning (SoTL) to spread in Spain and Latin America and for the scientific communities working in the educational innovation of Higher Education to find a new meeting point.

* * *

La Universidad del País Vasco/Euskal Herriko Unibertsitatea da la bienvenida a la tercera edición de EuroSoTL, el Congreso Europeo de Scholarship of Teaching and Learning, o Enfoque académico de la enseñanza y el aprendizaje que tendrá lugar los días 13 y 14 de junio de 2019. El congreso está organizado en colaboración con el grupo europeo de la International Society for Scholarship of Teaching and Learning —ISSOTL— y la Red Estatatal de Docencia Universitaria —RED-U—. Este congreso se celebra en el País Vasco, un pequeño país que atesora el hecho de hablar la lengua más antigua de Europa y de tener su propia identidad cultural. Nos reuniremos en Bilbao, en el Bizkaia Aretoa, que además de estar en el centro de la ciudad cuenta con salas y espacios en los que las personas participantes podrán disfrutar este entorno, discutir nuevas temáticas sobre la enseñanza y el aprendizaje en Educación Superior e intercambiar experiencias. Tras dos celebraciones anteriores en Cork, Irlanda (2015) y Lund, Suecia (2017) este nuevo congreso pretende abrir una ventana para que el Enfoque Académico de la Docencia y el Aprendizaje (SoTL) comience a ser conocido tanto en el Estado español como en Latinoamérica y que las comunidades científicas que trabajan en la innovación educativa de la Educación Superior encuentren un nuevo punto de conexión y encuentro.

* * *

Aurtengo Konferentziaren inspirazioa – This year's Conference inspiration – La inspiración de la conferencia de este año

SoTL, edo Irakaskuntzaren eta Ikaskuntzaren Ikuspegi Akademikoa kontzeptua, oso zabalduta dago ingeles hizkuntza duten herrialdeetan, baina, ordea, ez da oso ezaguna beste testuinguru batzuetan, besteak beste, Espainian, Italian edo Frantzian. Hala ere, Europa eta Latinoamerika osoan eta diziplina guztietan, beren jardunaren analisi zientifikoa egiteko ahalegina egiten duten irakasle taldeak daude. Oso ohikoa da errealitateari behatzean hobetu daitekeen alderdiren bat ikusten badugu, horren jatorria zein den, nola hobetu eta dagoeneko zer irtenbide planteatu diren jakin nahi izatea. Horren inguruan aztertu eta hausnartu ondoren, testuinguruari aplika dakizkiokeen aukerak diseinatu eta emaitzak aztertu eta partekatuko ditugu. Unibertsitatean irakaskuntzako jardunbide egokien ezagutzan aurrera egiteko helburu bera dugu; gure ikasleek hobeto nola ikas dezaketen jakin nahi dugu. SoTL-k errealitate handi horren kontzeptu eta antolamenduari babesa ematen dio. Society for the Scholarship of Teaching and Learning elkarteak berariaz jaso du diziplina guztietan eta mundu mailan Goi Mailako Hezkuntzaren irakaskuntza eta ikaskuntza hobetzen eta antolatzen duenari buruzko emaitzak aztertzen, ikertzen eta aurkezten duten irakasleen, laguntzarako langileen eta ikasleen elkartearen izaera. (ISSOTL konferentzien pedagogia).

EuroSoTL 2019k honako **gaiak** aurkezten ditu, komunikazioak eta posterrak aurkezteko.

1. Azterketaren eta ikerketaren garapena graduko eta graduondoko ikasleetan.
2. Ikasleen inplikazioa bultzatzen duten esperientziak (Student Engagement).

3. Gero eta ugariagoak diren esperientzia berriak, ikaskuntza sakona eta esanguratsua sustatzen dutenak.
4. Ikaskuntzaren eta irakaskuntzaren ikuspegi profesionala irakasleen garapen profesionala garatzeko helburu gisa.
5. SoTL eta Garapen Jasangarrirako Helburuak (Agenda 2030).

* * *

The SoTL or Scholarship of Teaching and Learning concept is very widespread in English-speaking countries, but it is not a familiar one in Spain, Italy and France. However, there are teaching groups seeking to analyse their practice scientifically throughout Europe and Latin America and in all fields. It is quite common that if we ascertain an aspect is likely to be improved when observing the reality, we will then want to know what its origin is, how to improve it and which solutions have already been proposed. After exploring and reflecting on this, we will design alternatives applicable to the context and we will analyse and share the results. Our common purpose is to advance in the knowledge of best teaching practices at the university and how our students can better learn. SoTL is the organisational and conceptual umbrella for this highly important reality. The International Society for the Scholarship of Teaching and Learning has expressly convened academic and support staff and students from across the disciplines and around the world as a community that explores, researches and disseminates findings on what improves and articulates higher education learning and teaching (ISSOTL Conference Pedagogy).

EuroSoTL 2019 has announced the following **themes** for submitting papers and posters:

1. Developing inquiry and research in undergraduate and post-graduate students.
2. Experiences that stimulate student engagement.
3. Emerging and unpublished experiences that foster significant and deep learning.
4. The professional approach to teaching and learning as the objective of the professional development of academic staff.
5. SoTL and the Sustainable Development Goals (2030 Agenda).

* * *

El concepto SoTL o Enfoque académico de la enseñanza y el aprendizaje, está muy extendido en los países de habla inglesa; en cambio, es poco conocido en otros contextos como el hispanoparlante, el italiano o el francés. Sin embargo, en todo Europa y Lationamérica y en todas las disciplinas existen grupos docentes que tratan de hacer un análisis científico de su práctica. Es muy habitual que, si de la observación de la realidad inferimos un aspecto susceptible de mejora, nos surge la inquietud de saber cuál es su origen, cómo mejorarlo y qué soluciones ya han sido planteadas. Tras indagar y reflexionar sobre ello, diseñaremos alternativas aplicables al contexto y analizaremos y compartiremos los resultados. Nos une el propósito común de avanzar en el conocimiento de mejores prácticas docentes en la universidad, nos une saber cómo pueden aprender mejor nuestros y nuestras estudiantes. SoTL es el paraguas que da cobertura conceptual y organizativa a esta realidad de gran envergadura. Internacional Society for the Scholarship of Teaching and Learning ha recogido de forma expresa su carácter de comunidad de docentes, personal de apoyo y alumnado que a lo largo y ancho de todas las disciplinas y a nivel mundial indaga, investiga y presenta resultados sobre qué mejora y articula la enseñanza y el aprendizaje en Educación Superior (Pedagogía de las conferencias ISSOTL).

EuroSoTL 2019 presenta las siguientes **temáticas** de cara a la presentación de comunicaciones y pósteres:

1. El desarrollo de la indagación y de la investigación en estudiantes de grado y postgrado.
2. Experiencias que estimulan la implicación del alumnado (Student Engagement).
3. Experiencias emergentes e inéditas que propician aprendizaje profundo y significativo.
4. El Enfoque profesional de la enseñanza y el aprendizaje como objetivo del desarrollo profesional del profesorado.
5. SoTL y los Objetivos de Desarrollo Sostenible (Agenda 2030).

* * *

2
Kongresuaren antolatzaileak / Conference Organizers / Organizadores del Congreso

Euskal Herriko Unibertsitatea – University of the Basque Country – Universidad del País Vasco

Euskal Herriko Unibertsitatea Euskal Herriko unibertsitate publikoa da, Euskal Autonomi Erkidegoko hiru probintzietan, hiru campusetan banatuta: Bizkaia, Gipuzkoa eta Araba. Bilboko Unibertsitatearen oinordekoa da, 1980ko otsailaren 25ean Euskal Herriko Unibertsitate bilakatu zena. Bere lema Eman ta zabal zazu, XIX. mendeko Gernikako Arbolaren bertso bat da. Bere ikurra Eduardo Chillida eskultoreak diseinatu zuen 70eko hamarkadan, eta trantsizioan protesta ikur bihurtu zen. 300.000 lagunetik gora dira unibertsitate honetan, jakintzaren arlo guztietan, graduatu direnak. Unibertsitate publikoa gara, euskal kulturan erro sakonak ditugu, baina mundura irekita gaude eta etengabe ari gara aldatzen.

* * *

The University of the Basque Country is the public university of the Basque Country, articulated in three campuses located in each of the three provinces of the community: Bizkaia, Gipuzkoa and Araba. She is the heir of the University of Bilbao, which on February 25, 1980 becomes the University of the Basque Country / Euskal Herriko Unibertsitatea. Its motto is Give and spread it (in Basque Eman ta zabal zazu), which is in turn a verse of the Gernikako Arbola, a Basque anthem of the 19th century. Its emblem was designed by the sculptor Eduardo Chillida in the 1970s, and became a symbol of protest in the Transition. It has already trained more than 300,000 graduates and graduates in all areas of knowledge. We are a public university, with deep roots in the Basque culture, but open to the world and in constant process of change.

* * *

La Universidad del País Vasco es la universidad pública del País Vasco, articulada en tres campus situados en cada una de las tres provincias de la comunidad: Bizkaia, Gipuzkoa y Araba. Es heredera de la Universidad de Bilbao, la cual el 25 de febrero de 1980 se convierte en la Universidad del País Vasco/Euskal Herriko Unibertsitatea. Su lema es Dalo y difúndelo (en euskera Eman ta zabal zazu), que es a su vez un verso del Gernikako Arbola, un himno vasco del siglo XIX. Su emblema fue diseñado por el escultor Eduardo Chillida en la década de 1970, y se convirtió en símbolo reivindicativo en la Transición. Ya ha formado a más de 300.000 graduados y graduadas en todas las áreas del saber. Somos una universidad pública, con hondas raíces en la cultura vasca, pero abierta al mundo y en constante proceso de cambio.

RED-U & EuroSOTL-ISSOTL

UPV/EHUKO Berrikuntzaren, Gizarte Konpromisoaren eta Kulturgintzaren arloko Errektoreordetzako Hezkuntzarako Laguntza Zerbitzuarekin (SAE-HELAZ) batera, RED-U eta EuroSoTL dira Biltzar honen antolatzaileak.

* * *

Jointly with the Educational Advisory Service (SAE-HELAZ) of the Vice-rectorrate for innovation, social commitment and cultural action of UPV/EHU, RED-U and EuroSoTL have participated in the organization of this Conference.

* * *

Juntamente con el Servicio de Asesoramiento Educativo del Vicerrectorado de Innovación, Compromiso Social y Acción Cultural de la UPV/EHU, RED-U y EuroSoTL han participado en la organización de este Congreso.

Unibertsitateko Irakaskuntzako Estatuko Sarea

Spanish Network of University Teaching

Red Estatal de Docencia Universitaria

RED-U unibertsitate-komunitate bat da, hogeita hamar unibertsitate publiko eta pribatu inguru bildutzen duena, handituz doana Espainiako unibertsitateko irakasle berritzaile eta ikerkelari banakakoekin. Bere interesa da irakaskuntzarako formakuntzari buruzko buruzko hausnarketa egitea, eta Unibertsitateko irakaskuntzan berrikuntza eta Ikerkuntza egitea.

* * *

RED-U is a community participated by about thirty public and private universities, in addition to an increasing number of individual academics from Spanish universities, interested in reflection on teacher training, innovation and research in University Teaching.

* * *

RED-U es una comunidad universitaria participada por cerca de treinta universidades públicas y privadas, además de un creciente número de académicos individuales del ámbito universitario español, interesada en la reflexión sobre la formación docente, la innovación y la investigación en Docencia Universitaria (DU).

International Society for Scholarship of Teaching and Learning-en Europako adarra

European regional section of the International Society for Scholarship of Teaching and Learning

Sección Europea del International Society for Scholarship of Teaching and Learning

EuroSoTL ISSOTLen Europako adarra da. ISSOTL, Irakaskuntzaren eta Ikaskuntzaren Ikuspegi Akademikorako Nazioarteko Elkarteak, irakaskuntza eta ikaskuntza lan intelektual serio gisa hartzen duten irakasleentzat, langileentzat eta ikasleentzat lan egiten du. Azpiegitura intelektuala eta lankidetzazkoa eraikiz, elkarteak irakaskuntzari eta ikaskuntzari buruzko lan akademikoa bultzatzen du.

* * *

EuroSoTL is the European branch of ISSOTL, the International Society for the Scholarship of Teaching and Learning, Inc., which serves faculty members, staff, and students who care about teaching, and learning as serious intellectual work. Through building intellectual and collaborative infrastructure, the Society supports the associational life that fosters scholarly work about teaching and learning.

* * *

EuroSoTL es la rama europea de ISSOTL, la Sociedad Internacional para el enfoque académico de la Enseñanza y el Aprendizaje, que da servicio a profesores y profesoras universitarias, personal y estudiantes que se preocupan por la enseñanza y el aprendizaje como un trabajo intelectual serio. A través de la construcción de infraestructura intelectual y de colaboración, la Sociedad apoya la vida asociativa que fomenta el trabajo académico sobre la enseñanza y el aprendizaje.

Bizkaia Aretoa: Eraikina– The Building – El Edificio

Eraikina Bilboko gune enblematiko batean kokatzen da; «L» formarekin, itsasadarrari eta Guggenheim museoari begira, Abandoibarra etorbidearen erdi-erdian dago, Pedro Arrupe eta Deustuko zubien artean. Eraikin enblematiko hau Álvaro Siza arkitektoak diseinatu du, eta lehentasuna eman dio «inguruaren eskala mantentzeari, erlaitz batzuk errespetatuz eta oinezkoaren zerbitzuetarako beheko solairua bultzatuz. Irekia eta barrualdea bistan izanik, beheko solairuak hegal zabalak ditu, eremu pribatua publikoan txertatzeko, eta alderantziz».

* * *

This building is located in one of the most emblematic parts of Bilbao. L-shaped, it opens out onto the estuary and the Guggenheim Museum, right in the centre of Avenida Abandoibarra, between the Padre Arrupe footbridge and the bridge known as the Puente de Deusto. It is an emblematic building designed by the architect Álvaro Siza, who has given priority to "maintaining the scale of the place, respecting cornices and placing the ground floor at the service of the pedestrian, open and permeable, offering views inside with huge wings that integrate the private space in the public area and vice versa".

* * *

Este edificio se sitúa en una de las zonas más emblemáticas de Bilbao, con una construcción en forma de «L», abierto hacia la Ría y el Museo Guggenheim, en pleno centro de la avenida de Abandoibarra, entre la pasarela Padre Arrupe y el Puente de Deusto. Se trata de un edificio emblemático, diseñado por el arquitecto Álvaro Siza, quien ha priorizado «mantener la escala del entorno, respetando unas cornisas y potenciando una planta baja al servicio del peatón, abierta y permeable visualmente hacia su interior y con amplios vuelos que integran el espacio privado en el público y viceversa».

Kokapena – Location – Localización

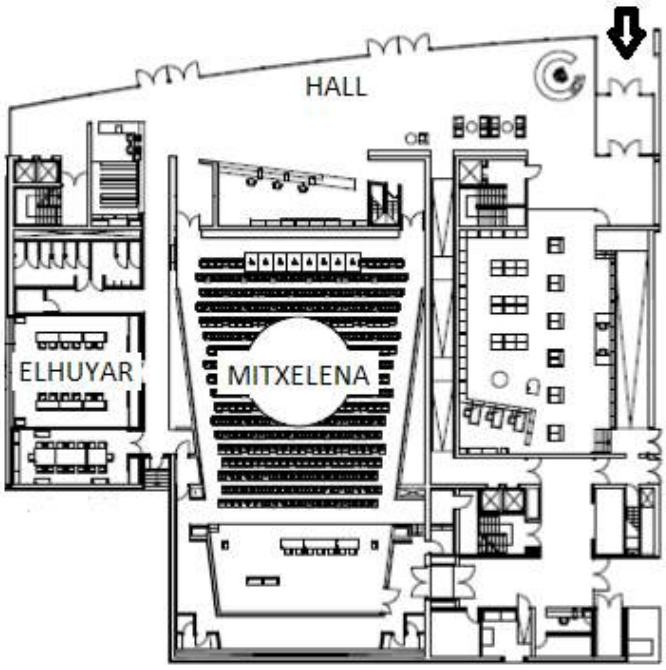
Helbidea – Address - Dirección: Avenida Abandoibarra, 3 48009 Bilbao
GPS coord.: 43.26867,-2.93752
Map (pdf ,2,075.39 Mb)
Link: Google Maps

Wifi

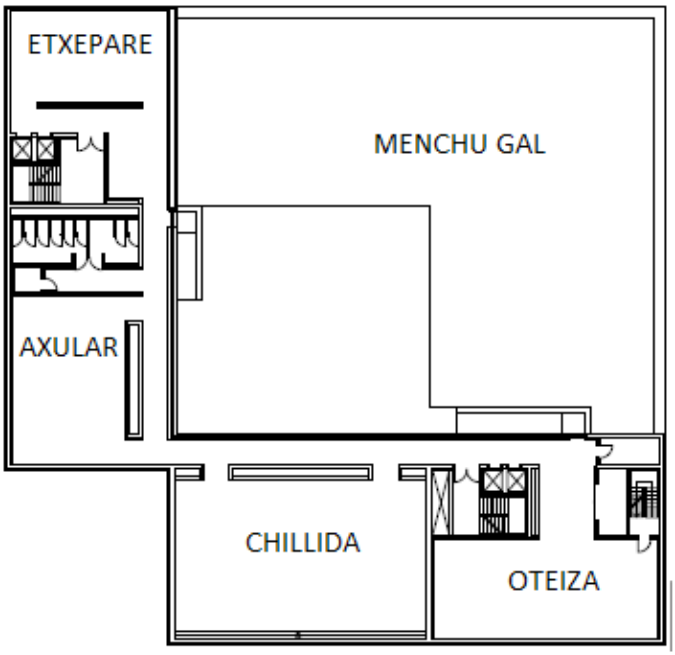
— SSID: EHU-wGuest.
— Login: EuroSOTL2019.
— Password: EuroSOTL2019.

Planoak espazioen kokapenarekin – Maps indicating the location of spaces – Planos con la ubicación de los espacios

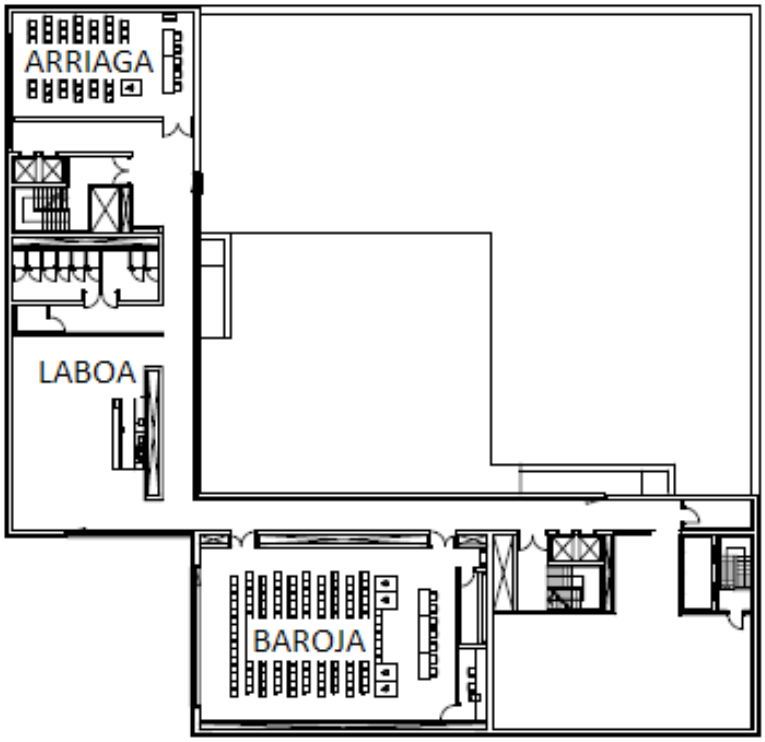
0 Solairua – Level 0 – Planta 0



1 Solairua – Level 1 – Planta 1



2. Solairua – Level 2 – Planta 2



Biltzar jasangarria – Suistanable conference – Congreso sostenible

ERRONKA GARBIA
INGURUMEN ALDETIK JASANGARRIA DEN EKITALDIA

Euskal Herriko Unibertsitateak bere Agenda 2030en bitartez, Garapen Jasangarrirako Helburuekin duen konpromisoa agertu du, eta Kongresu honek ere, bat egiten du helburu horiekin. EuroSoTL biltzarreko Batzorde Antolatzaileak lanean dihardu, garapen iraunkorrerako printzipioak errespetatzen dituen eta Agenda 2030arekin bat datorren ekitaldia izan dadin. Horretarako, jarduketa ezberdinak abiarazi ditugu, sei ardatzen inguruan (mugikortasuna, energia, ura, erosketak, instalakuntzak eta hondakinak), ekitaldiaren fase ezberdinetan (diseinu eta plangintza, antolakuntza, gauzatzea eta jarraipena, desmuntaketa eta itxiera).

— Genero-berdintasuna sustatuko da hizlariei eta batzordekideei dagokienez.
— Ekitaldia garraio publikoko sarearen barruan dagoen eta energia aurrezteko neurriak dituen leku batean egingo da.
— Joan-etorriak motorrik gabeko eta/edo 'Eco' edo 'emisiorik gabeko' ibilgailutan egitea sustatuko da.
— Hondakinen sorrera prebenituko da.
— Material birziklatuak eta birziklagarriak erabiliko dira.
— Biodibertsitatea eta tokiko ingurumen aberastasuna sustatuko dira.
— Cateringa ingurumen eta gizarte irizpideak aplikatuz kontratatuko da.
— Gizarte-bazterketa pairatzeko arriskuan dauden gizataldeak, antolakuntzaren parte izango dira.

* * *

The University of the Basque Country has recently published its comittment with the Sustainable Development Goals by means of its Agenda 2030, and so does this conference. The Organizing Committee of EuroSoTL-2019 is working to ensure that this conference is respectful to the principles of sustainable development and of Agenda 2030. In order to help meet this goal, we have introduced a variety of initiatives concentrated on six axes (mobility, energy, water, shopping, facilities and wastes) at different stages of the event (design and planning, organization, celebration and monitoring, dismantling and closure).

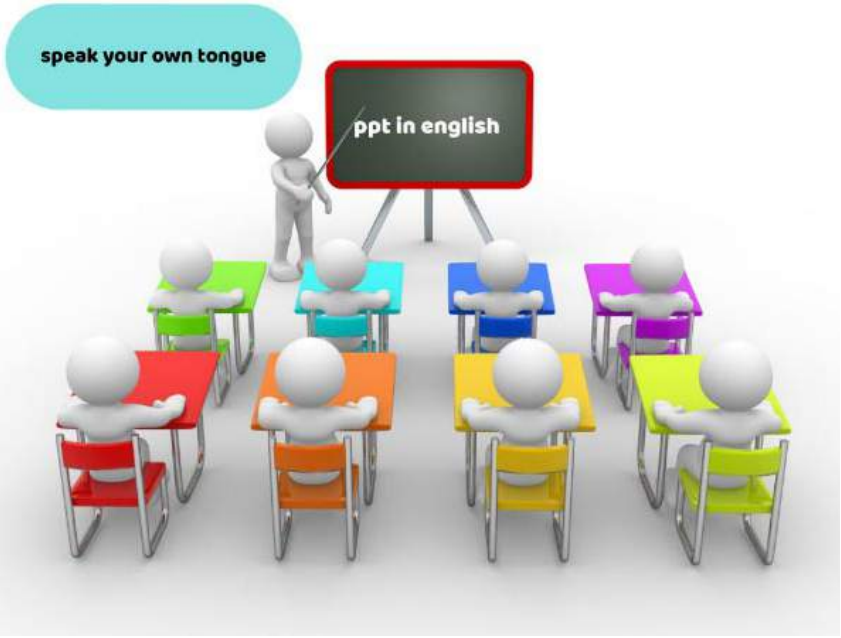
— Promotion of gender equality in the selection of the speakers and members of the committee.
— Celebration of the event in a place integrated into the public transport network and with energy-saving and energy efficiency measures.
— Promotion of transport on non-motorized transport means and/or 'Eco' or 'zero emission' vehicles
— Prevention of waste generation.
— Use of recycled and recyclable materials.
— Encouragement of biodiversity and local environmental richness
— Engagement of a catering with environmental and social criteria.
— Integration within the organizing committee of social groups that are at risk of exclusion.

* * *

La Universidad del País Vasco ha hecho público su compromiso con los Objetivos de Desarrollo Sostenible mediante la presentación de su Agenda 2030, y del mismo modo, este Congreso subscribe dichos objetivos. El Comité Organizador de EuroSoTL está trabajando para que el congreso sea un evento respetuoso con los principios del desarrollo sostenible y con la Agenda 2030. Para ello, hemos puesto en marcha una serie de actuaciones entorno a seis ejes (movilidad, energía, agua, compras, instalaciones y residuos) en las diferentes fases del evento (diseño y planificación, organización, celebración y seguimiento, desmontaje y cierre).

— Promoción de la igualdad de género en ponentes y miembros del comité.
— Celebración del evento en un lugar integrado en la red pública de transporte y con medidas para el ahorro y eficiencia energética.
— Promoción del traslado en medios no motorizados y/o vehículos 'Eco' o 'cero emisiones'.
— Prevención de la generación de residuos.
— Empleo de materiales reciclados y reciclables.
— Promoción de la biodiversidad y riqueza ambiental local.
— Contratación de catering con criterios ambientales y sociales.
— Integración en la organización de colectivos en riesgo de exclusión social.

Hizkuntza aniztasuna – Diversity of Languages – Diversidad Lingüística



Euskal Herrian hiru hizkuntzatan mintzo gara: euskara, gaztelania eta frantsesa, lurraldea zein den. Euskal Herriko Unibertsitatean, espainiar lurraldean dagoela, horietako bitan hitz egiten dugu. Mundura irteten garenean geure proiektuen berri ematen, ordea, ingelesa erabili ohi dugu. Europan 200 hizkuntzatatik gora hitz egiten dira eta, kontutan hartuta per-

tsona guztiek oro bere hizkuntzaz hitz egiteko eskubidea duela, kongresu honetan erakutsi nahi dugu hizkuntza horietako asko entzun eta aditzeko prest gaudela. Aski zail lirudikeen arren, helburu hori lortu ahal da ingelesa lingua franca gisa erabilita idatzizko materialetan eta hirugarren pertsonen laguntzaz baliatuta, hizkuntza berean mintzo ez diren pertsonen arteko zubia egiteko. Hortaz, kongresuan parte hartuko duten pertsona guztiei eskatzen diegu libre senti daitezela nor bere hizkuntzaz mintzatzeko, unean une erosoen zaion hizkuntza baliatzeko, bai eta hizkuntza ezberdinetako hiztunen arteko komunikazioa erraz dezatela ere.

* * *

You can find people in the Basque Country speaking three languages: Euskara, Spanish and French, depending on the State. In the University of the Basque Country, which is located in Spain, we speak two languages. However, when we travel around the world to talk about our projects, English is the language of choice most of the times. In Europe, there are more than 200 languages, and, considering that everybody has the right to communicate in its own language, we want to declare that we are ready to hear a big amount of them. Although this situation might seem quite complicated, we will use English as "lingua franca" for writing, and the help of third persons who might play the role of a bridge between people speaking different languages. We kindly ask to the participants to feel free to speak the language in which they are more comfortable in each situation and to try to facilitate the communication among different language speakers whenever they can.

* * *

En Euskal Herria hablamos tres lenguas: euskera, español y francés, dependiendo del territorio. En la Universidad del País Vasco, sita en el territorio español, hablamos dos. Cuando salimos al mundo a comunicar los resultados de nuestros proyectos, en cambio, generalmente utilizamos el inglés. En Europa se hablan más de 200 lenguas, y dado que todas las personas tienen derecho a expresarse en su lengua, en este congreso queremos mostrar nuestra disposición a escuchar hablar un gran número de ellas. Esto, que puede parecer un tanto complicado, se resuelve mediante la utilización del inglés como lengua franca en los materiales escritos, y con la ayuda de terceros que puedan hacer de puente entre personas que no hablan un mismo idioma. Pedimos a todas las personas que van a participar en el congreso que se sientan libres de expresarse en la lengua en la que se encuentren más confortables en cada ocasión, procurando asimismo facilitar la comunicación entre hablantes de diferentes lenguas.

3
Batzordeak eta Laguntzaileak / Committees and Volunteers / Comités y Voluntarios

Nazioarteko Batzorde Zientifikoa – International Scientific Committee – Comite Científico Internacional

Bettie Higgs, University College Cork
Juan Carlos Ponce Campuzano, University of Queensland
Torgny Roxå, Lund University
Mariela Casas Uribe, Universidad de Los Lagos
Fadia Khouri Saavedra, Universidad del Norte Barranquilla
Mª Rocío Carranza Alcántar, Universidad de Guadalajara
Kelly Mathews, University of Queensland
Christophe Roiné, Université de Bordeaux
Francisco Javier Hoyuelos Álvaro, Universidad de Burgos
Javier Paricio Royo, Universidad de Zaragoza
Gregorio Rodríguez Gómez, Universidad de Cádiz
Mª Soledad Ibarra Sáiz, Universidad de Cádiz
Amparo Fernández March, Universitat Politécnica de Valéncia
Eloína García Félix, Universitat Politécnica de Valéncia
Antoni Portell Llorca, Universitat de Vic
Susan Orbe Mandaluniz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Juana Maria Goizueta Vertiz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Yolanda Fernández de Aránguiz Guridi, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Jose Domingo García Merino, Universidad del País Vasco/Euskal Herriko Unibertsitatea
José Luis Pizarro Sanz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Juan José Mijangos del Campo, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Marta Arrue Mauleón, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Ainhoa Álvarez Arana, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Miren Ikerne Del Valle Erquiaga, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Pilar Ruiz de Gauna Bahillo, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Teodoro Palomares Casado, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Itziar Rekalde Rodríguez, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Xabi Sancho Saiz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Itziar Txurruka Ortega, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Joseba Ezeiza Ramos, Universidad del País Vasco/Euskal Herriko Unibertsitatea

Batzorde Antolatzailea – Organizing Committee – Comité Organizador

Katarina Mårtensson, Lund University
Claire Hamshire, Manchester Metropolitan University
Rie Troelsen, University of Southern Denmark
Peter Felten, Elon University
Bettie Higgs, University College Cork
Gregorio Rodriguez Gómez, Universidad de Cádiz
Idoia Fernandez Fernandez, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Rosa Martí Altés, Universitat Pompeu Fabra
Juan Vazquez Cabello, Universidad de Sevilla
Antoni Portell i Llorca, Universitat de Vic
Mirari Ayerbe Díaz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Elena Díaz Ereño, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Urtza Garay Ruiz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Mikel Garmendia Mujika, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Iker Ros Martinez de la Hidalga, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Eneritz Ugarte Velasco, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Deine Larrabeiti Mendikute, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Maite Barrenetxea Pujana, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Susan Orbe Mandaluniz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
José Luis Pizarro Sanz, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Estibaliz Saez de Cámara Oleaga, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Jose Fermín Perez Cerejido, Universidad del País Vasco/Euskal Herriko Unibertsitatea
Oihane Landazabal Bernabeu, Universidad del País Vasco/Euskal Herriko Unibertsitatea

UPV/EHUko ikasle laguntzaileak – Student volunteers from UPV/EHU – Estudiantes voluntarios y voluntarias de la UPV/EHU

Lina Patricia Chima Martínez
Chmad Hamudi Hiya
Jokin Ochoa Iriondo
Fiston Intasi Tabu
Marjorie Baño Jacome
Aarón Blanco Prieto
Marta Blázquez Meruelo
Verónica Miranda Romero
Lorena Rodero Muñoa
María Mayora López
Ali Ahli Mohtar

4
Hizlari gonbidatuak / Invited speakers / Ponentes invitados/as

"Proyectos de innovación y premios a la calidad docente universitaria: ¿en qué medida contribuyen al desarrollo institucional docente?"
por *Mònica Feixas*

Una de las líneas de actuación estratégica en la mayoría de universidades, si no en todas, se identifica con la transformación docente de las enseñanzas universitarias, que suele presentarse en forma de convocatorias destinadas a impulsar proyectos de innovación docente. Asimismo, en muchas universidades las ideas innovadoras en docencia y las soluciones didácticas excelentes se honran y hacen visibles anualmente con un premio de enseñanza. Aunque la transformación docente en la universidad tiene más facetas, las políticas que desarrollan la innovación y premian la calidad han significado una oportunidad única para que docentes decidan impulsar sus conceptos didácticos y los programas de estudios decidan realizar esfuerzos innovadores. La conferencia pretende dar respuesta a las siguientes preguntas: ¿Están los proyectos de innovación docente y los premios a la excelencia educativa cambiando la percepción de la importancia de la docencia universitaria? ¿Promueven las actuales convocatorias de premios y proyectos de innovación un "enfoque académico de enseñanza y aprendizaje" (Scholarship of Teaching and Learning)? ¿Qué impacto tienen dichas convocatorias en el desarrollo docente individual y en el desarrollo institucional? ¿Qué instrumentos utilizan las políticas que desarrollan y premian la calidad docente? ¿Cómo facilitan que los conceptos didácticos y transformadores de los docentes se materialicen con éxito y su dinamismo se sostenga en el tiempo?

Mònica Feixas doktorea Universitat Autònoma de Barcelona-ko (UAB) Irakasle titularra da Pedagogia Aplikatuko Departamentuan. Pedagogian lizentziatua da, Hezkuntzaren Administrazioko Master titulua du Columbia Unibertsitateko Teachers College-n lortua (AEB) eta bere doktoradutza UABn egin zuen Hezkuntza Zientzietan. Graduko eta graduondoko eskolak eman ditu 18 urte baino gehiagoz, irakasleen hasierako formakuntza eta formakuntza etengabean. Erakundearen Garapenerako Taldearen (EDO) kide sortzailea da. 2014. urtean Suitzara aldatu zen bere familiarekin. St. Gallen Unibertsitateko Institut für Wirtschaftspädagogik-ean ikerlari postu bat betetzen du, eta gaur egun arduraldi partzialeko lana egiten du Pädagogische Hochschule Zürich-eko Center of Teaching and Learning in Higher Education-en. Espainiako, Latinoamerikako eta Suitzako hainbat unibertsitateko irakasleen formakuntzarako unitateekin elkarlanean aritzen da, ikerketa proiektuetan eta ahol-

kularitza pedagogikoa eskaintzen. Bere ikerketa interesak dira irakaskuntza eta ikaskuntza kulturak goi mailako hezkuntzan, unibertsitateko irakasleen formazio pedagogikoa eta ikasitakoaren transferentzia.

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Dr. Mònica Feixas is Associate Professor in the Department of Applied Pedagogy at the Universitat Autònoma de Barcelona (UAB). She holds a Licenciature in Pedagogy, a Master's degree (M.Ed) in Educational Administration (Teachers College, Columbia University), and a Doctorate (PhD) in Education (UAB). She has taught graduate and postgraduate courses in educational management and didactics in higher education for more than 18 years as part of teachers' initial and continuous training. Dr Feixas is a foundational member of the EDO research group (Equipo de Desarrollo Organizacional- Organisational Development Team). In 2014 she moved to Switzerland with her family. She was Research Fellow at the Institut für Wirtschaftspädagogik, Universität St. Gallen and, at present, she works part-time for the Center of Teaching and Learning in Higher Education at the Pädagogische Hochschule Zürich. She collaborates regularly with academic development units of universities in Spain, Latin-America as well as Switzerland in research projects and pedagogical consultancy. Her main research interests include teaching and learning cultures in higher education, pedagogical training of university teachers and transfer of training.

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La Dra. Mònica Feixas es profesora titular en el Departamento de Pedagogía Aplicada de la Universitat Autònoma de Barcelona (UAB). Es licenciada en Pedagogía, posee un Master en Administración de la Educación por el Teachers College (Columbia University, EUA). y doctora en Ciencias de la Educación por la UAB. Ha impartido docencia en cursos de grado y postgrado durante más de 18 años, como parte de la formación inicial y continua del profesorado. Es miembro fundacional del Equipo de Desarrollo Organizacional (EDO). En 2014 se trasladó a Suiza con su familia. Ocupa u puesto como investigadora en el Institut für Wirtschaftspädagogik, de la Universität St. Gallen, y, en la actualidad, trabaja a tiempo parcial en el Center of Teaching and Learning in Higher Education de la Pädagogische Hochschule Zürich. Colabora asiduamente con las unidades de formación del profesorado de diversas universidades españolas, latinoamericanas y suizas, en proyectos de investigación y como consultora pedagógica. Sus intereses en investigación incluyen las culturas de enseñanza y aprendizaje en educación superior, formación pedagógica del profesorado universitario y transferencia del aprendizaje.

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"Relationships matter: Moving relationship-rich experiences from the periphery to the center of higher education learning and teaching" by *Peter Felten*

Decades of rigorous research in the U.S. documents the transformative power of relationship-rich learning experiences for students in higher education. These experiences can occur in many formats and locations, including active learning exercises in lecture halls, team-based work in a community setting, and mentored research in a laboratory. Relational pedagogies contribute to everything from enhanced disciplinary learning and student engagement to identity development and a clarified sense of purpose, and these positive outcomes have long-term professional, civic, and personal significance for graduates. Yet many faculty and institutions do not focus on the centrality of relationship-rich experiences for students, and most SoTL also looks elsewhere for evidence of learning. In this session, we will explore the possibility of centering teaching practices and SoTL inquiries on the power of relationships to shape learning. This has implications not only for our classrooms and scholarly activity, but also for communities beyond the university. In a world wracked by divisions, the capacity to build and sustain relationships, particularly across differences, is vital for graduates to live fulfilling lives and to contribute to the common good. How can our teaching —and our SoTL— make that more possible?

Peter Felten Historiako irakaslea da, Irakaskuntza-Ikaskuntzaren Errektoreordea eta Ikaskuntza Engaiaturako Zentroaren zuzendari exekutiboa Elon Unibertsitatean. Bere ikerkuntza gaur egun, gizakien arteko harremanen eraginean eta Graduko hezkuntzako pertsonen eta instituzioen eraldaketan ardazten da. Bere argitalpenen artean, aipagarriak dira "The Undergraduate Experience: Focusing Institutions on What Matters Most" (Jossey-Bass, 2016); "Transforming Students: Fulfilling the Promise of Higher Education" (Johns Hopkins University Press, 2014); "Engaging Students as Partners in Learning and Teaching" (Jossey-Bass, 2014); "Transformative Conversations" (Jossey-Bass, 2013), aleak, zeinetan autoreeetako bat izan den, eta Intersectionality in Action (Stylus, 2016) liburua, zeinaren ko-editore izan den. "International Society for Teaching and Learning" erakundearen lehendakari lanak egin ditu (2016-2017), eta baita ere POD Network erakundean (2010-11), Estatu Batuetako unibertsitateko irakasleen formatzaileen elkargo profesionalean. "International Journal for Academic Development" aldizkariaren ko-editorea da, eta Gardner Institute, Estatu Batuetan goi mailako hezkuntzan ekitatearen alde egiten duen fundazioaren kidea.

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Peter Felten is a professor of history, assistant provost for teaching and learning, and executive director of the Center for Engaged Learning at Elon University. His current research focuses on the influence of human relationships, and on individual and institutional change, in undergraduate education. His books include the co-authored volumes: The

Undergraduate Experience: Focusing Institutions on What Matters Most (Jossey-Bass, 2016); Transforming Students: Fulfilling the Promise of Higher Education (Johns Hopkins University Press, 2014); Engaging Students as Partners in Learning and Teaching (Jossey-Bass, 2014); Transformative Conversations (Jossey-Bass, 2013); and the co-edited book Intersectionality in Action (Stylus, 2016). He has served as president of the International Society for the Scholarship of Teaching and Learning (2016-2017) and also of the POD Network (2010-2011), the U.S. professional society for educational developers. He is co-editor of the International Journal for Academic Development and a fellow of the Gardner Institute, a U.S. foundation that works to advance equity in higher education.

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Peter Felten es profesor de Historia, Vicerrector de Enseñanza y Aprendizaje y director ejecutivo del Centro para el Aprendizaje Comprometido de la Universidad de Elon. Su investigación actualmente se centra en la influencia de las relaciones humanas y en el cambio personal e institucional en la educación de Grado. Entre sus publicaciones destacan los volúmenes "The Undergraduate Experience: Focusing Institutions on What Matters Most" (Jossey-Bass, 2016); "Transforming Students: Fulfilling the Promise of Higher Education" (Johns Hopkins University Press, 2014); "Engaging Students as Partners in Learning and Teaching" (Jossey-Bass, 2014); "Transformative Conversations" (Jossey-Bass, 2013) de los que es coautor, y el libro Intersectionality in Action (Stylus, 2016) del que es coeditor. Ha servido como presidente de la "International Society for Teaching and Learning" (2016-2017), así como de POD Network (2010-11), la asociación profesional de formadores del profesorado universitario de Estados Unidos. Es co-editor de la revista "International Journal for Academic Development" y miembro del Gardner Institute, una fundación estadounidense que trabaja en pro de la equidad en la educación superior.

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Panel: "Growing SoTL in different environments: from seeds to woodlands"

Participants: Araceli Adam, Katarina Mårtensson, Anja Pawelleck and Óscar Jerez

Different contexts naturally adapt differently. Stories are diverse from place to place, time to time. This panel will share experiences across several countries on how SoTL is introduced, planted, fostered and hopefully blooms to create enriched environments or communities of practice. Some questions as terminology, time, advance, evolution, drivers, motion, or diffusion will be posed to the participants who will show their point of view.

Coordinator: *Torgny Roxå*

Torgny Roxå, Lund Unibertsitateko (Suedia) Ingeniaritza Fakultateko irakaslea da.. 30 urte daramatza garapen akademikoan lanean, Goi Hezkuntzako erakundeen kalitatearen kulturaren indartzean bereziki. Berak sortu zuen Lundeko lehen pedagogia eskola, ETP, duela 17 urte. Eskola hau inspirazio iturri izan da Suedian eta nazioarteko beste erakunde batzuetan. 25 urtez jardun du ingeniaritzako irakasleei prestakuntza ematen. Gaur egun, ETPan bizitako esperientzietatik abiatuta, kalitatearen bermeko sistema bat ezartzen ari da. Bere ikerkuntza Goi Hezkuntzako erakundeen prestakuntza kulturan aldaketa estrategikoan ardaztu du, sare eta mikrokulturetan bereziki. Halaber, Hezkuntza Lidergoko Akademiko Goren izendatu dute Canadako McMaster Unibertsitatean.

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Torgny Roxå is an Associate professor at Lund University (Sweden), Faculty of Engineering. He has 30 years of experience in academic development with a focus on developing quality cultures in higher education organisations. He developed the first pedagogical academy, the Lund ETP, which now runs on its 17th year and inspired both Swedish and international institutions. He has taught engineering teachers for the last 25 years. And, he is currently engaged in the implementation of a new quality assurance system based on the experiences gained from the ETP-system. His research is focused upon strategic change in teaching cultures within higher education organisations, especially significant networks and microcultures. He is also appointed Distinguished Scholar in Educational Leadership at McMaster University in Canada.

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Torgny Roxå es profesor en la Facultad de Ingeniería de la Universidad de Lund (Suecia). Tiene una experiencia de 30 años en el desarrollo académico, centrado en el fortaleci-

miento de la cultura de la calidad en las organizaciones de Educación Superior. El creó la primera academia de pedagogía en Lund, la ETP, hace ya 17 años, la cual ha sido fuente de inspiración en Suecia y en otras instituciones internacionales. Ha formado al profesorado de ingeniería durante 25 años. Hoy en día está comprometido con la implementación de un sistema de aseguramiento de la calidad basado en las experiencias vividas en la ETP. Su investigación se focaliza en el cambio estratégico de las culturas de formación en las instituciones de Educación Superior, especialmente en redes y microsistemas. Asimismo, ha sido nombrado Académico Distinguido en Liderazgo Educativo por la Universidad de McMaster en Canadá.

Araceli Adam

Catalunyako Unibertsitate Politeknikoko (UPC) kudeaketa arduraduna da. Bere lanaren bitartez 1997az geroztik Hezkuntza Zientzien Institutuari (ICE) babesa eman dio. ICEk unibertsitateko irakaskuntzaren kalitatea hobetze aldera lan egiten du, prestakuntza emanez eta irakaskuntzaren hobekuntza sustatuz. 2007tik Estatuko Unibertsitate-Irakaskuntzako Sarearen (RED-U) kide da, International Consortium for Educational Development-en (ICED) barneratuta dagoena, sarearen idazkari gisa zuzendaritza-batzordean lan egin zuelarik.

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Management officer at the Universitat Politècnica de Catalunya BarcelonaTech (UPC), where she has worked since 1997 supporting the role of its Institute of Education Sciences, the academic unit of the UPC that contributes to quality teaching at the university by providing teacher training and encouraging teaching enhancement. She is a member (from 2007) of the Spanish national Network of University Teaching (Red-U), a peer association affiliated to the International Consortium of Educational Development (ICED), and a former member of its board as secretary of the association.

* * *

Técnica de gestión en la Universitat Politècnica de Catalunya (UPC), donde ha trabajado desde 1997 apoyando el papel de su Instituto de Ciencias de la Educación, unidad académica de la UPC que contribuye a la enseñanza de calidad en la universidad, proporcionando formación docente y fomentando la mejora de la enseñanza. Es miembro (desde 2007) de la Red Estatal de Docencia Universitaria (RED-U), del International Consortium for Educational Development (ICED) y ex miembro de su junta como secretaria de la asociación.

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Katarina Mårtensson

Katarina Mårtensson doktorea irakaslea eta irakasleen formatzailea da Lundeko Unibertsitatean (Suedia). Bere lana zera da: garapen instituzionala sustatzea garapen akademikoaren bitartez, ikaskuntza-irakaskuntzaren azterketa akademikoa eta lidergoaren garapena. Bere ikerkuntza eta jarduera akademikoa bereziki honetan gauzatzen ditu: sare sozialak, mikro-kultura akademikoak, akademian ematen diren harremanak eta lidergoa. Bere Doktorego Tesia 2014an argitaratu zuen izenburu honekin: "Influencing teaching and learning microcultures: Academic development in a research-intensive university". ISSOTLen buru-kide izan da, Ikaskuntza-irakaskuntzaren azterketa eta garapenerako nazioarteko elkartearena, eta IJAD, International Journal for Academic Development aldizkariaren ko-editorea 2013tik 2016ra.

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Dr. Katarina Mårtensson is senior lecturer and academic developer at Lund University, Sweden. Her work includes supporting organisational development through academic development, scholarship of teaching and learning, and leadership development. Her research and scholarly work focus on social networks, academic microcultures, collegiality and academic leadership. Her PhD-thesis from 2014 was titled "Influencing teaching and learning microcultures: Academic development in a research-intensive university". She is past co-president of ISSOTL, the International Society for Scholarship of Teaching and Learning, and was between 2013-2016 co-editor of IJAD, the International Journal for Academic Development.

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La Dra Katarina Mårtensson es profesora y formadora del profesorado en la Universidad de Lund, Suecia. Su trabajo consiste en apoyar el desarrollo institucional a través del desarrollo académico, el enfoque académico de la enseñanza y el aprendizaje, y el desarrollo del liderazgo. Su investigación y actividad académica se centran en redes sociales, micro-culturas académicas, relaciones en la academia y liderazgo. Su Tesis doctoral, publicada en 2014, lleva por título "Influencing teaching and learning microcultures: Academic development in a research-intensive university". Ha sido copresidenta de ISSOTL, la Sociedad Internacional del enfoque académico de la enseñanza y el aprendizaje" y fue co-editora de IJAD, International Journal for Academic Development, entre 2013 y 2016.

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Anja Pawelleck

Anja Pawelleck Zurich-eko Unibertsitateko irakaskuntza-ikaskuntzarako etengabeko formakuntzaren arduraduna da. Berak garatu, ezarri eta zuzendu zituen pertsonal akademikoaren garapen profesionalerako hainbat programa. Bereziki garatu ditu loturak indartzen dituzten Ikerkuntzan oinarritutako irakaskuntza-ikaskuntza (RBTL) eta irakaskuntza-ikaskuntzaren ikuspegi akademikoa (SoTL). Bere intereseko gaiak da gaitasun akademikoen garapenerako ikuspuntu holistikoa, iraraslegoaren rol eta ardura guztiak kontuan hartzen dituena.

* * *

Anja Pawelleck is head of continuing education in university teaching and learning at the University of Zurich. She developed, implemented and run different programs in professional development for academic staff; esp. programs which strengthen the nexus through the implementation of research-based teaching and learning (RBTL) and scholarship of teaching and learning (SoTL). Furthermore, she is interested in holistic approaches to academic competence development that take into account all roles and responsibilities of academic staff.

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Anja Pawelleck es responsable de educación continua en enseñanza y aprendizaje en la Universidad de Zurich. Desarrolló, implementó y dirigió diferentes programas de desarrollo profesional para el personal académico; especialmente programas que fortalecen el nexo a través de la implementación de la enseñanza basada en la investigación y el aprendizaje (RBTL) y el enfoque académico de la enseñanza y el aprendizaje (SoTL). Además, está interesada en enfoques holísticos para el desarrollo de competencias académicas que tengan en cuenta todos los roles y responsabilidades del personal académico.

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Óscar Jerez

Psikologia eta hezkuntzako doktorea. Hainbat unibertsitate eta goi hezkuntzako erakunderen aholkulari eta kontsultorea. 36 irakaskuntza eta ikaskuntza gune baino gehiagoren sortzaile kide Iberoamerikan eta Afrikan. Lan ildoak ditu berrikuntza, irakaskuntza garapena eta kalitatearen gestio eta aholkularitza. Gaur egun karguotan da: Txileko unibertsitatearen Ekonomia eta Negozioen fakultateko irakaskuntza eta ikaskuntza guneko zuzendaria; goi hezkuntzarako prestakuntza programako zuzendari akademikoa (FES); eta, Txileko unibertsitatean, doktoregoko ikasleen unibertsitate irakaskuntzarako prestakuntza programaren koordinatzailea.

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He got his PhD in Psychology and Education. Advisor and consultant in a variety of universities and institutions of Higher Education. Co-creator of 36 Centres for Teaching and Learning in Ibero-America and Africa. His research interests are innovation, academic development and quality management and assurance. Nowadays, he is the director of the Centre for Teaching and Learning at the Faculty of Economics and Business, University of Chile; Academic director of the Higher Education Training Program (FES); coordinator of the training program of PhD students for university teaching skills, at University of Chile.

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Doctor en Psicología y Educación. Asesor y consultor de variadas universidades e instituciones de Educación Superior. Co-creador de más de 36 Centros de Enseñanza y Aprendizaje en Iberoamérica y África. Sus líneas son la innovación, desarrollo docente y en Gestión y Aseguramiento de la calidad. Actualmente es: Director del Centro de Enseñanza y Aprendizaje, de la Facultad de Economía y Negocios de la Universidad de Chile. Director académico del Programa de Formación en Educación Superior (FES); y coordinador del programa de formación en docencia universitaria para estudiantes de doctorado, en la Universidad de Chile.

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"Itinerarios hacia la buena docencia: un mapa para el viaje" por **Javier Paricio e Idoia Fernández**

La capacidad de mejora de la actividad docente del profesorado está necesariamente limitada por la calidad de sus concepciones de lo que es una buena docencia. Alguien con una concepción expositiva de la enseñanza simplemente ignorará que existen muchas otras dimensiones de una buena docencia, bien fundamentadas en la investigación, que obedecen a concepciones más avanzadas de lo que significa enseñar y lo que significa aprender. Hacer avanzar esas concepciones docentes es un requisito para la mejora y constituye un gran reto para los programas institucionales de desarrollo académico del profesorado en el ámbito docente. Antes de nada, avanzar en ese reto requiere un mapa sobre el que planificar, es decir, un esquema-marco coherente y ordenado de los factores clave que caracterizan esa buena docencia y las concepciones docentes en las que se insertan. Este es el objeto del Marco de desarrollo profesional docente del profesorado universitario desarrollado por impulso de RED-U que se discute aquí. En concreto, se argumentan las concepciones docentes que dan sentido a los cuatro niveles de desarrollo docente en los que se ha organizado este marco: desde una concepción del aprendizaje como "asimilación" de contenidos hasta el aprendizaje como transformación intelectual y personal, desde una concepción de la enseñanza como exposición a la enseñanza como indagación compartida y como hipótesis de investigación.

Javier Paricio

Zaragozako Unibertsitateko irakasle titularra. Artearen Historian lizentziaduna eta Filosofia eta Letretan doktorea Europako goi mailako hezkuntzaren kalitate sistemen azterlan erkatu bati buruzko tesi baten bidez. Irakaskuntzaren Berrikuntzarako errektorearen albokoa izan da (errektoreordearen pareko), unibertsitate honetako titulazioen kalitatearen arduraduna eta Hezkuntza Zientzien Institutuko —Zaragozako Unibertsitateko-irakasleen irakaskuntzaren prestakuntzaz eta berrikuntzaz arduratzen den zentroa— zuzendaria. Unibertsitate Irakaskuntzako Estatuko Sareko (RED-U) zuzendaritza batzordeko kidea. Gonbidatutako hizlaria unibertsitateko irakaskuntza hizpide izandako ehundik gorako nazioko eta nazioarteko biltzarretan. Hogeita lau argitalpen ditu (artikuluak, liburuak, liburuetako kapituluak) unibertsitateko irakaskuntzarekin eta irakasleen prestakuntzarekin lotutako gaien gainean. RED-Uk bultzatutako "Marco de desarrollo profesional docente del profesorado universitario" izeneko proiektuaren ikertzaile nagusia dugu".

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Javier Paricio Royo, phd in education sciences and full professor in the Faculty of Education of the University of Zaragoza. Member of the ARGOS research group specialized in Education. He has been Vice-rector for Educational Innovation and Quality at the University

of Zaragoza (2008-2012) and director of ICE (2003-2008), the center for the educational development of this university. Member of the board of directors of RED-U, the Spanish network for educational development in higher education. He is the author or co-author of 7 books, 9 book chapters and 4 scientific articles on higher education as well as multiple collaborations, communications and conferences at national and international meetings.

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Profesor Titular de la Universidad de Zaragoza. Licenciado en Historia del Arte y Doctor en Filosofía y Letras con una tesis sobre un estudio comparado de los sistemas de calidad de la educación superior en Europa. Ha sido Adjunto al Rector para Innovación Docente (asimilado a vicerrector) y responsable de la calidad de las titulaciones de esta Universidad y director del Instituto de Ciencias de la Educación, centro responsable de la formación y la innovación docente del profesorado de la UZ. Miembro de la junta directiva de la Red Estatal de Docencia Universitaria (RED-U). Ponente invitado en más de un centenar de congresos y encuentros nacionales e internacionales sobre docencia universitaria. Cuenta con veinticuatro publicaciones sobre cuestiones de docencia universitaria y formación de profesorado, entre artículos, libros y capítulos de libro. En la actualidad es el investigador principal del proyecto "Marco de desarrollo profesional docente del profesorado universitario" impulsado por RED-U.

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Idoia Fernández

Idoia Fernández Fernández Hezkuntza Zientzietan doktorea da (1993), eta Hezkuntzaren Teoria eta Historia Saileko irakasle titularra. Bilboko Irakasleen Unibertsitate Eskolan eta Donostiako Hezkuntza, Filosofia eta Antropologia Fakultatean irakasten du. 30 artikulu zientifikoren, 4 libururen eta 35 liburu kapitulu baino gehiagoren egilekidea da. Euskaraz, gaztelaniaz, ingelesez eta italieraz argiratu ditu lanak. Era berean, zenbait berrikuntza, garapen eta ikerketa proiekturen buru izan da goi mailako hezkuntzako irakaskuntzaren eta ikaskuntzaren arloan, eta nazioarteko tesi bat zuzendu du arlo horretan; 2011az geroztik, UPV/EHUk aitortutako IkasGura: hezkuntza aldaketa unibertsitatean taldeko ikertzaile nagusia da. Irakasle bisitari gisa egonaldiak egin ditu honako unibertsitate hauetan: University of Nevada (Reno, AEB), Swinburne University of Technology (Melbourne, Australia) eta Macquarie University (Sydney, Australia). 2010tik 2017ra, UPV/EHUko Hezkuntzarako Laguntza Zerbitzuko (HELAZ) zuzendaria da. Unibertsitate Irakaskuntzako Estatuko Sareko (REDU) zuzendaritza batzordeko kidea da. International Society for the Scholarship of Teaching and Learning (ISSOLT) elkarteko Europarako lehendakariordea izan zen 2016-2017 aldirako. Eta 2017tik EHUko Berrikuntzaren, Gizarte eta Kulturgintzaren arloko errektoreordea da.

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Idoia Fernández Fernández holds a phd in Science of Education (1993) and is a tenured lecturer at the Department of Theory and History of Education. She lectures at the Teacher Training College in Leioa and at the Faculty of Education, Philosophy and Anthropology in Donostia-San Sebastián. She has jointly authored 30 scientific papers, four books and over 35 book chapters, which have been published in Basque, Spanish, English and Italian. She has also led several R&D&I projects in the field of teaching and learning in higher education and has directed an international thesis in the same field. Since 2011 she has been the lead researcher in Grupo IkasGura: hezkuntza aldaketa unibertsitatean, a group recognised by the University of the Basque Country (UPV/EHU). She has spent time as a visiting lecturer at the University of Nevada (Reno, USA) and the Macquarie University (Sydney, Australia). Since 2010 to 2017 she has headed the Educational Assessment Unit (SAE-HELAZ) of the UPV/EHU. She is a board member of REDU (State Network of University Teachers) and a member of the editorial staff of its journal. She has been also Vice-President for Europe of the International Society for the Scholarship of Teaching and Learning (ISSOLT) for 2016-2017 and since 2017 Vice-rector for Innovation, Social Commitment and Culture.

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Idoia Fernández Fernández es doctora en Ciencias de la Educación y profesora titular del Departamento de Teoría e Historia de la Educación. Imparte docencia en la Escuela de Magisterio de Leioa y en la Facultad de Educación, Filosofía y Antropología de Donostia. Es coautora de 30 artículos científicos, cuatro libros y más de 35 capítulos de libro, publicados en euskara, castellano, inglés e italiano. Asimismo, ha liderado varios proyectos de innovación, desarrollo e investigación en el ámbito de la enseñanza y el aprendizaje en Educación Superior y ha dirigido una tesis internacional en este ámbito, siendo desde 2011 investigadora principal del Grupo IkasGura: hezkuntza aldaketa unibertsitatean, reconocido por la UPV/EHU. Ha realizado estancias como profesora visitante en la University of Nevada (Reno, EEUU), en Swinburne University of Technology (Melbourne, Australia) y en Macquarie University (Sydney, Australia). Desde 2010 hasta el 2017 ha sido directora del Servicio de Asesoramiento Educativo/Hezkuntza Aholkularitza Zerbitzua (SAE-HELAZ) de la UPV/EHU. Es miembro de la junta directiva de la Red Estatal de Docencia Universitaria (REDU). Fue Vice-presidenta para Europa de la International Society for the Scholarship of Teaching and Learning (ISSOLT) para el periodo 2016-2017. Y desde el 2017 es vicerrectora de Innovación, Compromiso Social y Acción Cultural de la UPV/EHU.

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5
Joanna Renc-Roe Saria / Award / Premio

SoTL, irakaskuntza-ikaskuntza akademikoa, etengabe mugitzen eta hazten ari den mugimendua da. Geografikoki, kontzeptualki eta metodologikoki hazten ari da, SoTL komunitateari ekarpena egiten dioten pertsonei esker. Pertsona batzuek mugak gainditu eta eremu berriak irekitzen dituzte. Horrelakoa zen Joanna Renc-Roe. Budapesteko Erdialdeko Europako Unibertsitatean zuen lanpostutik, bertan 13 urtez arituz, akademikoak SoTL-en murgiltzera gonbidatu zituen. Ez soilik Erdialdeko eta Ekialdeko Europakoak, baita Asia Erdialdekoak, Ekialde Hurbilekoak eta mundu osokoak ere. Joannak indarra eta inspirazioa ekarri zituen, eta SoTL-eko enbaxadore bikaina izan zen. Zoritxarrez 2016ko apirilean zendu zen, bete ezinezko hutsune bat sortuz. Bere ondarearen deskribapen sakonago baterako, adiskide zein profesional gisa, Europa Erdialdeko Unibertsitateko webgunean argitaratutako hiletaliburura jo: https://www.ceu.edu/article/2016-04-25/ceu-mourns-loss-ctl-lecturer-joanna-renc-roe. Joanna eta SoTL-eko beste akademiko esanguratsu batzuek SoTL-en mamiari buruz duten ikuspegia ezagutzeko https://www.youtube.com/watch?v=yvDKHHyx7YY ere ikus dezakezu. Joanna Renc-Roe saria EuroSoTL kongresu bakoitzean ematen zaio SoTL-eko mugak gainditzeagatik bereizten den ekarpenari. Saria ohorezko aitortza eta diploma bat da, kongresu bakoitzean hautatutako ekarpenaren egileei ematen zaiena.

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Scholarship of Teaching and Learning is a growing movement. It is growing geographically, conceptually, and methodologically, because of people contributing to the SoTL community. Sorne individuals push the boundaries and open up new frontiers. Joanna Rene-Roe was such a person. From her position at The Central European University in Budapest where she worked for 13 years, she inspired academics to engage in SoTL, not only in Central and in Eastern Europe but further into central Asia, the Middle East, and the world. Joanna was a force, an inspiration, and an excellent ambassador for SoTL. She sadly passed away in April 2016, and we miss her dearly. For a fuller account of Joanna's legacy, as a colleague and a professional, please read the obituary published on the Central European University website: https://www.ceu.edu/article/2016-04-25/ceu-moums-loss-ctl-lecturer-joanna-renc-roe. To see Joanna and other prominent SoTL-scholars explain their views on central SoTL perspective, you can also visit https://www.youtube.com/

watch?v=yvDKHHyx7YY . The Joanna Rene-Roe Award is presented during each EuroSoTL conference to the contribution that distinguishes itself for pushing the boundaries of SoTL. The nature of the award is an honourable recognition and a diploma, presented to the authors of the selected contribution during each conference.

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El enfoque académico de la Enseñanza y el Aprendizaje es un movimiento en expansión. Está creciendo geográfica, conceptual y metodológicamente, gracias a las personas que contribuyen a la comunidad SoTL. Algunas personas traspasan los límites y abren nuevas fronteras. Algunas de ellas, como Joanna Renc-Roe traspasan los límites y abren sus fronteras. Desde su puesto en la Universidad Central Europea en Budapest, donde trabajó durante 13 años, inspiró a los académicos y académicas a involucrarse en SoTL, no solo en Europa, sino también en Asia central, Medio Oriente y otros lugares del mundo. Joanna era fuerza, inspiración y una excelente embajadora de SoTL. Tristemente, Joanna falleció en abril de 2016, y la añoramos muchísimo. Para una descripción más completa de su legado, como colega y profesional, lea el obituario publicado en el sitio web de la Universidad Central Europea: https://www.ceu.edu/article/2016-04-25/ceu-mourns-loss-ctl-lecturer-joanna-renc-roe. También puede visualizar el vídeo https://www.youtube.com/ watch?v=yvDKHHyx7YY donde encontrará a Joanna y otros/as destacados/as académicos/as de SoTL explicando sus puntos de vista sobre las perspectivas centrales de SoTL. El Premio Joanna Renc-Roe se entrega en cada congreso EuroSoTL a la contribución que se distingue por superar los límites de SoTL. El premio consiste en el reconocimiento honorífico y un diploma, entregado a las autoras y autores de la contribución seleccionada en cada congreso.

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6
Programme – Programa

Programa Osoa - Full Program - Programa Completo

EKAINAK 12: KONFERENTZIA AURREKO EGUNA – JUNE 12: PRECONFERENCE DAY – 12 DE JUNIO: JORNADA PRECONGRESO						
	MITXELENA	**ELHUYAR**	**OTEIZA**	**BAROJA**	**ARRIAGA**	**LABOA**
11:00-13:00					**Reunión Iberoamericana:** Marco para el desarrollo académico y profesional del profesorado universitario	
13:00-14:30	**LUNCH** (Hall / Terraza Menchu Gal)					
14:30-16.30		**WORKSHOP:** *Decoding the disciplines* David Pace and Peter Lohse	**TALLER:** *¿qué es SoTL? Introducción al enfoque académico de la enseñanza y el aprendizaje* Sue Moron-Garcia y Mariela Casas			
16:30-17:30					**WELCOME TO NEWCOMERS** **ONGI ETORRIA BERRIEI** **BIENVENIDA A NOVELES**	

EKAINAK 13 – JUNE 13 – 13 DE JUNIO	
09:00-9:30	**HARRERA ETA ONGI ETORRIA – OPENNING AND WELCOME – RECEPCIÓN Y BIENVENIDA** Mitxelena Auditorium
9:30-10:15	**M. Feixas** *Proyectos de Innovación y Premios a la Calidad Docente Universitaria: ¿En qué medida contribuyen al Desarrollo Institucional Docente?* *Mitxelena Auditorium*
10:15-10:45	**IREKIERA INSTITUZIONALA – INSTITUTIONAL OPENNING BY AUTHORITIES – APERTURA INSTITUCIONAL** **Nekane Balluerka Lasa**, UPV/EHUko Errektorea – Rector of UPV/EHU – Rectora de la UPV/EHU; **Adolfo Morais Ezquerro**, Eusko Jaurlaritzaren Unibertsitate eta Ikerketako Sailburuordea – Vicechancellor for Universities and Research of the Basque Government – Viceconsejero de Universidades e Investigación del Gobierno Vasco, **Rie Troelsen**, ISSOTLen europar eskualdeko taldeko presidenteordea – Vice-presidentof the European region of ISSOTL – Vicepresidenta del grupo regional europeo de ISSOTL; **Gregorio Rodríguez Gómez**, RED-U-ko Presidentea – President of RED-U – Presidente de RED-U; **Idoia Fernández Fernández**, Berrikuntzaren, Gizarte Konpromisoaren eta Kulturgintzaren arloko errektoreordea – Vicerrector for Innovation, Social Outreach and Cultural Activities – Vicerrectora de Innovación, Compromiso Social y Acción Cultural. UPV/EHU Mitxelena Auditorium
10:45-11:15	**KAFERAKO TARTEA – COFEE BREAK – PAUSA CAFÉ** (Hall)

* Aldibereko saioetako ahozko komunikazioa tematikare eta hizkuntzen arabera antolatu dira
Oral presentations in parallel sessions have been scheduled according to their themes and presenting language
Las comunicaciones orales de las sesiones paralelas se han agrupado por temáticas e idiomas:

T-1. Azterketaren eta ikerketaren garapena graduko eta graduondoko ikasleetan – Developing inquiry and research in undergraduate and post-graduate students – El desarrollo de la indagación y de la investigación en estudiantes de grado y postgrado.
T-2. Ikasleen inplikazioa bultzatzen duten esperientziak – Experiences that stimulate student engagement – Experiencias que estimulan la implicación del alumnado.
T-3. Gero eta ugariagoak diren esperientzia berriak, ikaskuntza sakona eta esanguratsua sustatzen dutena – Emerging and unpublished experiences that foster significant and deep learning – Experiencias emergentes e inéditas que propician aprendizaje profundo y significativo.
T-4. Ikaskuntzaren eta irakaskuntzaren ikuspegi profesionala irakasleen garapen profesionala garatzeko helburu gisa – The professional approach to teaching and learning as the objective of the professional development of academic staff – El Enfoque profesional de la enseñanza y el aprendizaje como objetivo del desarrollo profesional del profesorado.
T-5. SoTL eta Garapen Jasangarrirako Helburuak (Agenda 2030) – SoTL and the Sustainable Development Goals (2030 Agenda) – SoTL y los Objetivos de Desarrollo Sostenible (Agenda 2030).

CAS: gaztelania – Spanish – castellano; **ENG**: ingelesa – English – inglés; **EUS**: euskara – Basque – euskera; **FR**: frantsesa – French – francés.

EKAINAK 13 – JUNE 13 – 13 DE JUNIO						
11:15-13:00	1. ALDIBEREKO SAIOAK – PARALLEL SESSIONS – SESIONES PARALELAS					
	MITXELENA T2-CAS	**ELHUYAR T1-ENG**	**OTEIZA T3-CAS**	**BAROJA T4-ENG**	**ARRIAGA T4-EUS-FR-CAS**	**LABOA T5-ENG**
11:15-11:35	Jenny Andrea Arntz (28) Aprendizaje más servicio: una metodología de aprendizaje significativo para la formación en gestión de proyectos de profesionales sanitarios	Nichola Cadet (22) Simulated learning: assessing student perceptions of skill development and employability in a criminology course	Monica Urzua (31) Implementación de la metodología A+S en los currículos innovados de la Universidad Autónoma de Chile	Claire Hamshire (26) Exploring staff perceptions of first-generation students to enhance professional development of academic staff	Catherine Lapassouse (70) The personal creation of a learning object «liked» by the student: a factor to stimulate engagement?	Maria Hussain (7) Blended learning beyond borders; the good, the bad and the ugly
11:35-11:55	Daniela Fuentes (197) Aportes del aprendizaje experiencial al desarrollo de competencias genéricas en estudiantes de enfermería en un curso de psiquiatría	Nurun Nahar (23) Students as partners in e-content creation: co-designing and delivery of the curriculum	Angela Saiz (60) ¿Que podemos aprender de otros contextos? Un estudio sobre el practicum de Magisterio en España, Italia y Portugal	Irma Meijerman (33) Supporting teachers in doing SoTL: development and effect of an interdisciplinary course at Utrecht University	Oihane Landazabal (209) Irakasleen iritzia goi hezkuntzako ikasketaren ebaluazioari buruz: Bordeleko eta Euskal Herriko Unibertsitateen konparaketa	Elizabeth Marquis (81) Academic staff perspectives on student-staff partnerships: redressing or reinforcing inequity in higher education?
11-55-12:15	Claudia Perez (115) Flipped classroom en la educación de enfermeras de 3.er año: como convertir la formación en un espacio de aprendizaje	Sam Lucie Dvorakova (146) Inquiring into what students think they learn in a science degree program: differences across subdisciplines	Angela Saiz (61) Fotografía participativa y reflexión. una propuesta innovadora en el practicum de magisterio de la universidad de Cantabria	Jackie Lysaght (39) The Scholarship Of teaching and learning paves the way for educational improvement in kinesiology	Jean Forgue (248) Transformer l'évaluation dans l'enseignement supérieur : deux enquêtes comparatives auprès des étudiants de l'Université de Bordeaux (UB) et de l'Université du Pays Basque (UPV / EHU)	Elizabeth Marquis (116) Documentary film, pedagogy, and social change

EKAINAK 13 – JUNE 13 – 13 DE JUNIO						
	MITXELENA T2-CAS	**ELHUYAR T1-ENG**	**OTEIZA T3-CAS**	**BAROJA T4-ENG**	**ARRIAGA T4-EUS-FR-CAS**	**LABOA T5-ENG**
12:15-12:35	David Hoyos (234) Estimulando la implicación del alumnado en economía ecológica mediante juegos colaborativos	Bettie Higgs (207) Enhancing student engagement through interdisciplinary, international field-based research that tackles global issues	Eider Gamboa (78) Sentipensar: hacia el descubrimiento de nuevas formas de incluir el cuerpo en los procesos formativos	Susannah McGowan (84) Fostering enquiry and conversations in teaching 'backstage' approach to educational development	Marta Arrue (101) El debate universitario guiado (DUG): una nueva herramienta docente que propicia el aprendizaje profundo y significativo	Maik Arnold (180) Problem-based learning in higher education service learning: implications for theory-practice-transfer
12:35-12:55	Esther Cruz (167) Implicación del alumnado universitario a través de un servicio de mejora de la calidad de vida de personas con discapacidad	Ayesha Khan (241) Imagine Create and bake: the ingredients to a successful faculty, staff, student-partner recipe		Maria Iris Pedersen (58) Facilitated multi-source feedback-exploring a new model for professional development of academic staff	Saloa Unanue (147) Problemetan oinarritutako ikaskuntzaren inplementazioaren emaitzen azterketa erizaintzako graduko «Erizaintza Klinikoa I» irakasgaian	Catherine O'Mahony (224) Teaching outward and connecting inward: innovate professional development programme to connect the curriculum with the SDGs

EKAINAK 13 – JUNE 13 – 13 DE JUNIO	
13:00-14:30	**LUNCH** (Hall / Terraza Menchu Gal)

EKAINAK 13 – JUNE 13 – 13 DE JUNIO						
14:30-15:30	2. ALDIBEREKO SAIOAK – PARALLEL SESSIONS – SESIONES PARALELAS					
	MITXELENA	**ELHUYAR T1-CAS**	**OTEIZA T-3 ENG**	**BAROJA T2-ENG**	**ARRIAGA T4-CAS**	**LABOA T5-CAS**
14:30-14.50		Ana Bonnin (316) Diseño de itinerario para una formación en investigación en el grado en Biotecnología en la Universidad Francisco de Vitoria	Alicia Prowse (20) Does your personal tutoring system engage your students? the three Es of SSM (efficacy, efficiency and effectiveness	Tracey Hilker (49) Working with students as our partners to improve student engagement	Amparo Fernandez (159) Launching program in scholarship of teaching and learning	Marta Escapa (279) Aprendizaje basado en juegos de rol: una aplicación a la economía del cambio climático
14:50-15:10		Cristina Menéndez (298) El diseño de proyectos de intervención social a través del aprendizaje por retos	Marta Marco (38) Valoración de estudiantes y organizaciones sin ánimo de lucro implicadas tras la utilización de la metodología de aprendizaje (service-learning) en un curso de Marketing del grado de ADE	Eileen Farrell (52) Electronic and audio feedback: student engagement and perception	Gisela Schwartzman (87) Perspectiva académica de la enseñanza del profesorado universitario. ¿Sobre qué praácticas reflexionan los docentes a partir de su formación ?	Julieta Barrenechea (277) Ocean i3: International Educational Innovation Project on Ocean Sustainability; Campus Ocean (Université de Bordeaux & University of the Basque Country)
15:10-15:30		Nahia Seijas (151) Contribución del trabajo de campo a la expresión del modelo en una secuencia indagativa sobre el modelo geológico con profesorado de primaria en formación	Andrew Walsh (50) Playfully thinking about playful learning	Niamh Moore-Cherry (76) Partnership student orientation and peer mentoring: embedding students as partners as 'culture' in a new social sciences programme	Carolina Roni (89) Problematizar, diseñar y valorar. Acciones reflexivas para mejorar la tarea docente	Maite de Blas (123) Cálculo de la huella ambiental y social de la Escuela de Ingeniería de Bilbao (UPV/EHU)

EKAINAK 13 – JUNE 13 – 13 DE JUNIO		
15.30-16.45	**POSTER SAIOA ETA KAFEA – SESIÓN DE POSTERS Y CAFÉ – POSTER SESSION & COFFEE** Chillida - Axular - Etxepare	**RED-U Biltzarra – Reunión de RED-U – RED-U Meeting** Arriaga
16:45-17:45	**Peter Felten** *Relationships Matter: Moving Relationship-Rich Experiences from the Periphery to the Center of Higher Education Learning and Teaching* Mitxelena Auditorium	
17:45-19:30	**Astialdia - Spare Time - Tiempo libre**	
19:30	**BIZKAIA ZUBIARI BISITA ETA AFARIA – VISIT TO BIZKAIA BRIDGE AND DINNER – VISITA AL PUENTE BIZKAIA Y CENA** Irteera autobuses Bizkaia Aretotik - Departure form Bizkaia Aretoa by bus - Salida desde Bizkaia Aretoa en autobús URH Palacio Oriol Hoteletik autobusez itzuliko da Bizkaia Aretora Return from URH Palacio Oriol Hotel to Bizkaia Aretoa by bus around 22.30 Regreso desde el Hotel URH Palacio Oriol hasta Bizkaia Aretoa en autobús sobre las 22:30	

EKAINAK 14 – JUNE 14 – 14 DE JUNIO						
8:30-9:30	3. ALDIBEREKO SAIOAK – PARALLEL SESSIONS – SESIONES PARALELAS					
	MITXELENA T4-ENG	**ELHUYAR T1-T4-CAS-ENG**	**OTEIZA T3-ENG**	**BAROJA T2-ENG**	**ARRIAGA DECODING-ENG**	**LABOA T4-CAS**
08:30-08:50	Monica Alterskjaer Sundset (69) Enhancing a collective approach to teaching in the spirit of SoTL	Vanessa Soria (139) Aprender investigación investigando: aplicación de la metodología inductiva de Aprendizaje Basado en Investigación (ABI) en el proceso enseñanza-aprendizaje de la asignatura de investigación Socioeductiva de Educación Social de la Universidad de Barcelona	Matthias Kampmann (99) An online learning diary as a means to develop writing and teaching competencies in software engineering science	Siobhán O'Sullivan (79) Students as partners in research in higher education: the views of students from a socio-economically disadvantaged area	David Pace (270) What is wrong with decoding	M.ª Yolanda Fdez de Aranguiz (18) La formación del profesorado para la sostenibilidad y multidisciplinaridad en proyectos de educación superior
08:50-09:10	Ragnhild Sandvoll (105) The complexities between professional development of academic staff, local culture and educational leadership	Gloria Aparicio (6) The 'student engagement' as the framework of the 'Scholarship of Teaching and Learning' in the higher education	Simon Warren (97) Re-Thinking problem-oriented learning and the challenge of global learning	Máire Leane (102) Setting the tinderbox of student engagement alight: drawing on the principles of SoTL to stimulate activism in an undergraduate module on sexualities and society in University College Cork (UCC) Ireland	E. Leslie Cameron (307) Using methods from cognitive psychology to elucidate mental processes	Mariela Casas (323) Un análisis bibliográfico sobre programas de formación para el desarrollo académico de la docencia universitaria enfocados en Scholarship of Teaching and Learning (Sotl)
09:10-09:30	Katja Hakel (119) Learning assistants as key partners in the Scholarship of Teaching and Learning		Michael Agnew (245) Exploring the Role of the Instructional Skills Workshop (ISW) in Shaping "Backstage" Conversations about Teaching	Jennifer Friberg (107) Outcomes from a SoTL certificate program for graduate students	Peter Riegler (271) Lost in language comprehension: decoding putatively extra-disciplinary expertise	Sandra Sandoval (30): Proyecto Quiron: una propuesta de mentoría Docente, en Ciencias de la Salud

09:30- 11:00	**PANEL:** *Growing SoTL in Different Environments: From Seeds to Woodlands* ***Torgny Roxå, Araceli Adam, Óscar Jerez, Katarina Mårtensson & Anja Pawelleck*** Mitxelena Auditorium
11:00-11:30	**KAFERAKO TARTEA – COFFEE BREAK – PAUSA CAFÉ** Chillida, Axular & Etxepare

EKAINAK 14 – JUNE 14 – 14 DE JUNIO						
11:30-12:30	**4. ALDIBEREKO SAIOAK – PARALLEL SESSIONS – SESIONES PARALELAS**					
	MITXELENA T4-ENG	**ELHUYAR T5-EUS**	**OTEIZA T2-CAS**	**BAROJA T2-ENG**	**ARRIAGA T3-ENG**	**LABOA T2-ENG**
11:30-11:50	Sidsel Winther (163) Using the technology moso to support the teaching observations in collegial. Intervision in teaching development of academic staff	Estibaliz Saez De Camara Oleaga (36) Campus Bizia Lab: langile, ikasle eta irakasleen arteko kooperazio bidezko lanaren bitartez iraunkortasunaren alde lan egiten duen Euskal Herriko Unibertsitatearen (UPV/EHU) programa	Rocio Vélez Rivera (152) Análisis del uso de flipped learning en pregrado en una universidad chilena: radiografía de 5 años de experiencia	Idoia G. Gurtubay (118) Laurel vs Hardy: a PBL activity for motivating first year university students in physics	Fiachra Ó Súilleabháin (104) Empowering social work students and communities through community-based group research projects: co-constructing knowledge	Asier Aranzabal (223) Belbin team roles to enhance students' engagement to project based learning in chemical engineering
11:50- 12:10	Peter Riegler (244) Spatial aspects of teaching and learning: the classroom as a third educator	Olaia Martinez (205) Zehargaituz: gure esperientzia "iraunkoratsuna eta gizarte erantzukizuna" zeharkako gaitasun bezala lantzen metodologia aktibo eta kolaboratiboak erabiliz	Mila Amurrio (164) Avanzando en una docencia con perspectiva de género	Felipe I. Anfurrutia (120) Improving feedback with educational robots and visual programming environments to increase student engagement in programming modules	Cindy O'Shea (127) Developing the professional 'toolkit' making learning meaningful in applied youth and community work education	Izaskun Alvarez (211) Competition for the best formula dron project. Will it be able to stimulate the students?
12:10-12:30	Dagmar Engfer (243) Reflexivity in heterogeneous groups in higher education -the use of portfolios and projects to support individual reflective processes	Iñaki Karrera (136) Praktiken komunitateak: lankidetza medio hezkuntzan inklusio sarea sendotzen	Christophe Merlo (98) An integrated Project-based learning approach for a multi-disciplinary engineering design course	Sarah Bunnell (129) Inclusive empathy: a high-impact practice for increasing diversity, inclusion, and student success	Gery Nijenhuis (134) Cultural encounters: enhancing students' learning from a stay abroad	Roque Borinaga (210) Using radio-controlled cars to analyse the dynamical behaviour in automobiles class

12:30-13:30	**I. Fernandez y J. Paricio.** *Itinerarios hacia la Buena Docencia: Un mapa para el viaje* Mitxelena Auditorium
13:30-15:00	**LUNCH** (Hall / Terraza Menchu Gal)

EKAINAK 14 – JUNE 14 – 14 DE JUNIO						
15:00-16:00	5. ALDIBEREKO SAIOAK – PARALLEL SESSIONS – SESIONES PARALELAS					
	MITXELENA T4-ENG	**ELHUYAR T-4 ENG**	**OTEIZA T2-CAS**	**BAROJA T2-ENG**	**ARRIAGA T3-ENG**	**LABOA T-3 EUS**
15:00-15:20	Brian Butler & Marian McCarthy (272) Universal design for learning: a vehicle to embed an inclusive learning culture via faculty training and development	Vanessa Cui (72) Transforming professional practice, perceptions and relationships through collaborative observation between lecturers and students: a case study	Aintzane Orkaizagirre (157) La teoría de la autodeterminación (SDT) y la implicación del estudiante: un método para medir la motivación, resiliencia, orientación al trabajo en equipo y las percepciones de competencias profesionales durante las actividades de aprendizaje	Eva Ulstrup (158) Recurrent waves of blue facebook screens during courses	M. Begoña Garcia (177) Development of active learning methodologies to improve passing rates in engineering	M. Barrere, J. Ezeiza, H Colomo, L. Imaz Justizia Soziala Lab Klinika Juridikoa hiru urteko ekimenaren emaitzak
15:20-15:40	Liisa Postareff (288) The interaction between university teachers' well-being and their pedagogical competence	Ignacio Laiton (35) Enseñanza de habilidades de pensamiento desde áreas disciplinares: el caso de la física	Sonia Ruiz de Azua (257) Utilización de las metodologías activas para mejorar las habilidades comunicativas de los estudiantes de odontología	Line Palle Andersen (170) Insights from previous semesters' students help new students engage better with the digital learning environments	Jorun Nyléhn (194) Learning strategies, personality mindset among first-year biology students	
15:40-16:00	Natalie Simper (14) The fish bowl: reflexivity of think-aloud processes for faculty and curriculum development		Noelia Valle (292) El uso de videos docentes en la enseñanza superior	Christopher Love (202) Beyond engagement: learning form students as partners in curriculum and assessment	Viktoriya Zipper (66) Contribution and importance of flexible assessment to sustainable, self-regulatory learning	

16:00-16:40	**JOANNA RENC-ROE SARIAREN EMATEA ETA AMAIERA EKITALDIA** **JOANNA RENC-ROE AWARD AND CLOSURE** **ENTREGA DEL PREMIO JOANNA RENC-ROE Y CLAUSURA** Mitxelena Auditorium

7
Ekarpenen Taula / Table of Contributions / Tabla de Contribuciones

Hasierako hitzaldia – Opening conference – Conferencia de apertura

Proyectos de innovación y premios a la calidad docente universitaria: su contribución al desarrollo institucional docente. Mònica Feixas.

Aldibereko Saioak – Parallel Sessions – Sesiones Paralelas

T1. Azterketaren eta ikerketaren garapena graduko eta graduondoko ikasleetan / Developing inquiry and research in undergraduate and post-graduate students / El desarrollo de la indagación y de la investigación en estudiantes de grado y postgrado.

T2. Ikasleen inplikazioa bultzatzen duten esperientziak (Student Engagement) / Experiences that stimulate student engagement / Experiencias que estimulan la implicación del alumnado (Student Engagement).

T3. Gero eta ugariagoak diren esperientzia berriak, ikaskuntza sakona eta esanguratsua sustatzen dutenak / Emerging and unpublished experiences that foster significant and deep learning / Experiencias emergentes e inéditas que propician aprendizaje profundo y significativo.

T4. Ikaskuntzaren eta irakaskuntzaren ikuspegi profesionala irakasleen garapen profesionala garatzeko helburu gisa /The professional approach to teaching and learning as the objective of the professional development of academic staff / El Enfoque profesional de la enseñanza y el aprendizaje como objetivo del desarrollo profesional del profesorado.

T5. SoTL eta Garapen Jasangarrirako Helburuak (Agenda 2030) / SoTL and the Sustainable Development Goals (2030 Agenda) / SoTL y los Objetivos de Desarrollo Sostenible (Agenda 2030).

Posterrak – Posters

Hasierako hitzaldia

Opening conference

Conferencia de apertura

Innovation funds and teaching awards: contributing to the institutional development of teaching

Proyectos de innovación y premios a la calidad docente universitaria: su contribución al desarrollo institucional docente

M. Feixas
Centre for Teaching and Learning in Higher Education, Zurich University of Teacher Education

Abstract

Teaching awards and innovation funds have been a part of the higher education for several decades. After years of funding projects and giving awards, institutions want to know if they are changing the perception of the importance of university teaching and how should they be designed to promote not only individual and team competences but also a systematic development of the learning culture in the organisation as well as the Scholarship of Teaching and Learning (SoTL). The contribution for the conference will review the literature on teacher awards and innovation funds; show evidence of their transfer in the improvement of individual, collective and institutional teaching and learning processes, and will illustrate with examples strategies used by innovation fonds and teaching awards to further develop institutional collaboration and SoTL.

1. Introduction

With the systems of higher education in Europe growing, diversifying and becoming increasingly internationalised, the questions of quality assurance and enhancement are taking a central place in the discussion of effective education for the future (Wissenschaftsrat position paper on "Strategien Hochschullehre", 2017). Public assessments and international rankings of higher education institutions are often based mostly on achievements in research, while undervaluing the teaching part of the higher education mission. Strengthening qualification for teaching and combining it with teaching-learning research should be at the forefront of higher education policies as effective higher education is created through interaction between qualified, well-supported educators and engaged students (Fung & Gordon, 2016). In the context of the importance of curricula and "good teaching", funding opportunities for enhancing teaching quality such as the teaching awards and innovation funds are under discussion (Gutmann & Schwuchow, 2018).

Teaching awards and innovation funds are important contributions to the transformation and rewarding of teachers' teaching and student learning at university (Gibbs, 2008; Feixas *et al.*, 2018). After years of funding projects and giving awards, experts start to question: Are they changing the perception of the importance of university teaching? How should they be designed to promote nor only individual and team competences but also support a systematic development of the learning culture in the organisation? How do they promote the Scholarship of Teaching and Learning? The contribution for the conference will review the literature on teacher awards and innovation funds; show evidence of their transfer in the improvement of individual, collective and institutional teaching and learning processes, and will illustrate with examples some strategies to further develop institutional collaboration and SoTL.

2. Are teaching awards and innovation funds changing the perception of the importance of university teaching?

Teaching awards and innovation funds have been a part of the higher education for several decades. Typically, teaching awards programs reward individuals or groups with cash payments, salary increments, plaques, funds to conduct projects, or release time. In most cases, nominees are usually judged by a committee against certain preannounced criteria for excellence. Such awards have an immediate appeal and proponents associate them with many goals focusing on the quality of instruction.

Similarly, innovation funds sponsor and stimulate the development of teaching projects aiming to enhance, refine, or redesign the content, formats, and structures of instruction or evaluation, or to introduce creative new ideas. This includes a wide range of innovative curricula and curricular elements, such as: new approaches to student advising and supervising, course restructuring or redesign, e-learning elements or units, innovative assessment methods, tutorial and practical course formats, etc.

Innovation projects and teaching awards differ in the following aspects:

Table 1

Differences between teaching awards and innovation funds

	Teaching Award	Innovation projects' funds
Function	Appreciation of teaching in general Award for excellence also in teaching. Retrospective (and Prospective)	Impulse of concrete developments in teaching Innovations' culture in teaching Incentive programme
Criteria	Quality of proposal; adequation to the concept of the award; professional trajectory, quality of teaching (usually according to students' evaluations or opinions)	Quality of the proposal in its different dimensions; Team Composition
Target Group	Person or Team	Team (sometimes with students, non-teaching staff or external practitioners)
Area	Institution, Region, Nation	Institution, Region
Reputation	CV, Prestige, Security	CV, Recognition of a transformative idea
Key Thematic	Open version; Strategic Topics; Selected Topic yearly proposed	Open version; Strategic Topics; Starting or Advanced Fonds
Nomination	Self-nomination (teacher), Students, Peers, Institution (Combination)	Teacher (individually or Team)
Jury	Mixed commission	Center for Teaching and Learning in HE (or similar unit)

They all present opportunities and limitations for the enhancement of the quality in teaching and learning at the universities:

Table 2
Chances and risks of teaching awards and innovations funds

	Chances	Risks
Teaching awards	—incentivizing outstanding performance in teaching and learning (High Level Group on the Modernisation of Higher Education, 2013): • reminding of the value of teaching • highlighting good practice • recognising exemplary, inspirational teachers • attracting attention to the need of research into quality teaching and learning in universities	—raising the profile of, and rewarding, individual teaching rather than on the strategic development of teaching and learning (Trowler, Ashwin, & Saunders, 2014) —performance-based assessment of teaching and creation of constant competition between academics instead of collaborative work.
Innovation funds	—Support for teachers who want to improve, change or assess the efficacy of a certain teaching and learning intervention, method, resource; develop new curricular materials; and examine students' learning. —Provide support for enquiry into teaching and learning topics. —Raise the scholarship of teaching and learning, and thereby strengthen the evidence base for the 'common sense' that dominate discussions of practice in university didactics. —Typically, small amount of funding.	—Topics can be more personally motivated than institutionally oriented. —Limited impact on the institution. —Money is not enough.

2.1. Innovation funds: sponsoring and developing the quality of teaching

Innovation is an important element in the development of teaching. It is positive that institutions recognize and encourage the work done by university teachers involved in innovation processes (Feixas *et al.,* 2018). The financial support, guidance and supervision provided by universities make it possible to try out promising new approaches in courses and curricula, and to render the potential seen and experiences gained visible and realisable in the university environment. Without specific support it is often difficult to create spaces for exploration and innovation in normal teaching operations. Deepwell & Buckley (2013) argue that, , small-scale research projects following innovation experiences can make a difference and have been shown to enhance learning and teaching.

Innovation funds aim to:

—support teachers who want to improve, change or assess the efficacy of a certain teaching and learning intervention, method, resource; develop new curricular materials; and examine students' learning
—provide support for enquiry into teaching and learning topics
—raise the scholarship of teaching and learning, and thereby strengthen the evidence base for the 'common sense' that dominate discussions of practice in university didactics.

Typically, there is a small amount of funding (with some good exceptions). The calls are usually opened yearly and can address specific topics, according to the priorities of the institutional teaching and learning' strategy or suggest one only topic per year.

Innovation funds are positively changing the perception of the importance of university teaching, according to different studies (Arlett *et al.,* 2007; Mauri, Coll & Onrubia, 2007; López & Hinojosa, 2014). Despite assessing the quality of innovation processes is not an easy task (Feixas *et al.,* 2018). These contributions provided evidence of the capacity of the innovation fonds to deliver outcomes that enhance the teaching practices of the funded individuals and concluded that innovation projects laid the foundation for some significant developmental work that went on to make an impact on the discipline and to the staff and students it touched. Deepwell & Buckley (2013) demonstrated that it is the enthusiasm of the individual that is the key to successful innovation and long-term change, and that small-scale funding aimed at improving learning and teaching is more likely to succeed when 'top-down' institutional support coincides with 'bottom-up' enthusiasm from funded academics.

Feixas *et al.* (2018) looked at models which have led to an increased understanding of the acceptance, dissemination, transfer and impact of teaching innovations in higher education. The research used a questionnaire of factors assessing the potential impact of innovation funds, interviews to project coordinators and a focus group. Results underlined that the funds:

- had an impact in teaching if the design of the project was able to clearly measure the expected results
- had an impact on the individual professional development because teachers are motivated intrinsically by personal commitment; and the investment of time is rewarding as it does provide longer term gains
- had an impact on the discipline and study programme, thus it benefited the development of the didactical disciplinary knowledge
- had an impact on the teaching culture of the team because they strengthened peer cooperation and offered a space for exploring conceptual alternatives and improving skills and new tools
- had a limited impact on the institutionalisation of innovation because funding —despite welcomed— was not enough and there was inadequate pedagogical and technical support in the implementation. Also the recognition for their work in terms of promotion and visibility was limited.
- While the impact of each innovation on the students' learning was not possible to measure, respondents perceived a positive increased students' satisfaction with learning.

2.2. Teaching awards: recognise and celebrating excellent teaching

It has become a common practice to recognise and reward excellent teaching nationally and within the institution to improve the quality of teaching (Futter & Tremp, 2008). For example, many universities worldwide now have university teaching excellence awards, which is often linked to the idea of recognising and celebrating excellent university teachers, promoting and enabling the dissemination of excellent teaching (Skelton, 2004; Leibowitz *et al.,* 2012; Chism & Szabo, 1997). The concept of teaching awards comes from a university

context; universities of applied sciences have followed afterwards. In some countries, they are not institutionally stablished, but regional or national.

Teaching awards programs have been initiated for a plethora of announced purposes. While ultimately it is hoped that student learning will improve as a result of teaching awards programs, they focus on this goal indirectly-through teaching. Several papers articulate reasons why institutions offer teaching awards (e.g., Chism & Szabo, 1996; Olsson & Roxå, 2008; Futter & Tremp, 2008). McNaught and Anwyl (1993) categorized these and identified three main reasons:

- the main purpose is to recognize and reward the achievements of distinguished teachers. Awards are believed to affirm individuals and assure them that the energy and effort they invest in teaching is recognized and valued
- the second goal is to encourage teaching excellence across the faculty. Awards are expected to achieve this end through two activities: the self-examination that the nomination process is likely to stimulate and the dialogue that occurs in generating and applying a standardized set of criteria on what constitutes good teaching (an expectation also posed by Chism & Szabo, 1996) and
- third goal is to promote the value of teaching as an academic activity at the institution (3/24). The belief that awards programs send a strong message to faculty, students, and the public about the institution's commitment to excellence in teaching is echoed by many programs (Chism & Szabo, 1996).

Another goal that is set forth for teaching awards is that they provide valuable publicity for universities (Chism & Szabo, 1996; McNaught & Anwyl, 1993). This publicity may please legislatures and the public at large, but also may help to attract prospective professors and students. Positive gains can be obtained from balancing the emphasis placed on teaching and research within an institution and portraying an image of the institution as one in which teaching and research are interrelated (McNaught & Anwyl, 1993). Other goals of awards programs are identifying standardized criteria on what constitutes good teaching and selecting faculty who can provide role models for others. Some institutions anticipate that progressive refinements of what constitutes good teaching will be prompted by awards programs as they formulate and apply criteria. These definitions, in turn, might help the institution achieve more clarity on faculty teaching accountability issues (McNaught & Anwyl, 1993).

Teaching awards have usually one or more conceptions of teaching excellence underlying the scheme. According to Gibbs's study (2008), these can be the most common conceptions of such schemes:

Table 3
Conception of teaching excellence underlying the scheme (Gibbs, 2008:6-7)

1. With no conception	Excellence is not defined by the scheme and is simply asserted by applicants
2. Exhibiting certain teaching behaviours in a skilful way	Excellent teaching is characterised by certain observable teacher behaviours, primarily in the classroom, carried out with skill. Excellent teaching is what skilled teachers exhibit.
3. Implementing a student focus effectively	Excellent teaching is characterised by the quality of its attention to student learning.
4. Engaging in the 'scholarship of teaching'	Excellent teaching is characterised by rigorous thinking about teaching (Undertaking reflection; Having a personal philosophy of teaching; Making use of pedagogic literature; Undertaking pedagogic research)
5. Exploiting benefits from disciplinary research	Excellent teaching is characterised by the benefits derived from the teacher's research (Excellent teaching flows directly from excellent research; Undertaking 'research-based' teaching; Undertaking the 'scholarship of integration'; Displaying 'pedagogic subject knowledge')
6. Developing students	Excellent teaching involves a focus on the personal and intellectual development of the individual student and of their identity (Nurturing the development of individuals; Inducting students into the disciplinary or professional community)
7. Creating effective learning environments	Excellent teaching is characterised by a focus on students' overall experience of their course or entire programme, rather than on one component such as a classroom or a teacher (Creating effective courses or programmes; Collaborating in teaching teams)
8. Good citizenship	What is valued is the time and effort, and sometimes the leadership, that helps to create the educational context within which effective education is possible
9. Innovating in teaching	Excellence may be defined simply as change. Underlying assumption is that good teaching is achieved by a constant process of improvement and so evidence of innovation is of itself evidence of good teaching.
10. Developing the teaching of others	This conception is at heart about 'leadership of teaching'. This might involve dissemination in the form of giving seminars or workshops to other teachers about some aspect of teaching practice, either within the university or perhaps within the discipline nationally.
11. Corporate definitions of excellence	Here there may be a mission statement goal (for example improving student employability or retention) and the intention is that teaching is re-oriented towards achieving this goal.
12. Collegial definitions of excellence	Here what excellence in teaching consists of is defined and judged by peers (as it is in research) usually without being explicitly defined

Arguments for and against the use of awards are made in the literature (Chism, 2006) and in forums (Lang, 2012), but only few empirical studies of the effects of teaching awards programs have been conducted (Gibbs, 2008). In an international project involving 18 European universities, Efimenko *et al.* (2018) found out that teaching awards have a strong impact on such areas as motivating academic staff for high-quality teaching, encouraging innovation in teaching and learning activities, and improving institutional recognition and awareness about teaching and learning enhancement, but have no or little impact in promoting differentiation of academic profiles, encouraging a competitive attitude among

academics, encouraging an attitude of peer review and stimulating collaborative work in pedagogical issues and developing new programmes and courses.

How, then, do we know whether teaching awards are worthwhile?

— From the teachers' perspective, tangible recognition is very much appreciated. A teaching prize is a symbolic form of recognition and gives social prestige (Wiskelmann, 2018). Receiving a teaching award is a way to recharge the enthusiasm and motivation towards teaching. Knowing what the students think and value of the teacher's work in the classroom is what really matters, some tangible recognition is very treasured.
— From the students' perspective, it's an opportunity to enter into a public debate of what is good and excellent teaching, and how the institution values and promotes it.
— Institutionally, the different teaching award schemes have created a competitive culture that rewards star teachers; engaging teaching award applicants in conceptualising their excellent practice; professionalising academics' sense of teaching identity and increasing their commitment to teaching (Gunn & Fisk, 2013). This suggests that recognising and rewarding excellent teaching practice can be used as an effective approach to inspire academics to increase their commitment to teaching.
— Prospective awards (those that in addition to honouring the teacher or team, expect to use the funding to develop a transformative didactical concept) have the potential to influence the team, discipline and organisation if linked to the institutions' strategic action lines. According to Lang (2012), applying for teaching awards in a competitive process based on what you will do (prospective awards) is more accepted, rather than what you have done (or not done) (retrospective awards). If a university is going to grant release time, it's worth to grant it so that professors can use the extra time to develop and apply an innovative approach in the classroom.

Some criticism includes (Chism, 2006; Gibbs, 2008; Efimenko *et al.*, 2018):

— Lack of capacity to change values if criteria is based on rankings of teacher performance based on students' evaluation questionnaires. According to Gibbs (2008), it's not clear that they gradually change values over time, if awards rely upon students' ratings and main criteria are feedback questionnaires.
— These might be some of the limitations of teaching awards when they have been understood as an individual teacher's reward (a retrospective award), because they had an impact on the individual teacher but not on the team or institution. The German experience shows that the multiplication of teaching awards has hardly been accompanied by any conceptual further development (Jorzik, 2018; Wilkesmann, 2018). According to these authors, the existing personal teaching awards (retrospective awards) make non or very little contribution to the institutional development of teaching.
— Acknowledge of engagement in the process of improvement which has little to do with excellent teaching. In addition to rankings of teacher performance, some teaching awards look at whether the teacher is "reflective", whether they innovate, whether they can cite educational literature in their "teaching portfolio", whether they have received grants to develop teaching, whether they have attempted to link their research to their teaching, and so on. These are all possible indicators that the teacher is engaged in the process of improvement, but it does not tell if they are an excellent teacher or a better teacher than anyone else. What is being rewarded, may well be deserving of recognition but it many cases has little to do with excellent teaching (Gibbs, 2008).

— Arbitrary or ambiguous criteria and selection process not transparent: In some cases, the criteria for winning the awards are often ambiguous, if not arbitrary. Teaching awards can backfire, sapping the morale and productivity of professors who try too hard to win them if guidelines are not clearly articulated. This could become a reward lacking transparency in the selection process and can discourage teachers from going through new awards or grants.
— Individual teaching awards undermines team teaching by individualising what ideally is a group activity. Students' best learning experience and teachers' best teaching experience occurs when the curriculum is constructed with the advice of the whole team that shares the development, presentation and assessment. If it is a good course well taught with good outcomes, who should receive the award?
— Teaching awards have several potential pitfalls and these can be stretched because of interpretations *of other teachers* (Lang, 2012):

a) They can cause divisiveness among the faculty, create the impression that the award winners are "non-researchers," despite if the teacher has a balance between teaching and research and brings his/her research interests to the classroom.
b) Colleagues often interpret the reasons why the winner has been honoured. When students nominate the teacher, rumours can suggest that the teacher cater to the students desires for low content, low expectations, and high grades. Or statements of privileged situation if award-winners have some institutional responsibility or affinity to committees' presidency.

3. Initial ideas on the contribution of teaching awards and innovations funds to the institutional development and SoTL

Teaching awards and innovation funds have the potential to engage academics in the discussion about excellent teaching and promote rigorous thinking about teaching in the various ways suggested by SoTL (Boyer, 1990): undertaking reflection; promoting a personal philosophy of teaching; making use of pedagogic literature; and/or undertaking pedagogic research. They are a unique opportunity to develop disciplinary pedagogical research and also to enhance institutional cooperation and development in teaching.

On one side, teaching awards and innovation funds should count on the involvement and collaborative ethos of the disciplinary community, because academics are loyal to their disciplines and teaching practices vary with disciplines (Gunn & Fisk, 2013). However, they can go beyond the disciplines and contribute to the institutional development if primarily they require award and grant winners to undertake some clearly defined future scholar project in the area of teaching and learning that is strategically relevant to the university. Here research focused projects should provide an additional sound institutional needs' assessment and suggest cross-boundary work-based projects.

Teaching awards and innovation funds can meet both goals (SoTL and institutional development) by getting faculty members to undertake ground-level research in interdisciplinary teams, including students, to help the university investigate future change on the campus. These also benefits teachers and students professionally from the experiment, publishing articles, going to conference presentations which does count toward their promotion. And it helps counteract the impression that time to research on teaching in higher education is not possible. The traditional scholarship in their disciplines can be substituted in their promotion files for pedagogical research both generally and within their disciplines.

For the academic development centers, the opportunity lies in its participation in the conception of teaching awards and innovations funds, in the support with the implementation of the awarded projects (with training, coaching, etc.) and in the evaluation of its impact on the individual, team and organisational development, including on students' learning. Other suggestions include examining the conceptions of teaching excellence beyond students' nominations of best teachers; or to understand the change process focusing on how teachers do change (or students do learn), rather than why teachers don't change (or students don't learn) in order to help them facilitate that change.

In sum, successful grant and award winners suggested that engaging in an academic development programme and in developmental innovation projects, both built confidence and conferred legitimacy on pedagogical research (Palmer & Collins, 2006).

In the presentation, examples from Germany, UK, Ireland, Spain and Switzerland will be shown to illustrate these ideas further.

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Aldibereko Saioak

Parallel Sessions

Sesiones Paralelas

T1

Azterketaren eta ikerketaren garapena graduko eta graduondoko ikasleetan

Developing inquiry and research in undergraduate and post-graduate students

El desarrollo de la indagación y de la investigación en estudiantes de grado y postgrado

Simulated Learning: Assessing Student Perceptions of Skill Development and Employability in a Criminology Course

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Abstract

Internationally, there is an increasing focus on enhancing student employability as an outcome of successful university study (Pavlin and Svetlik 2014). While definitions of employability remain contested, the marketisation of universities in the UK and globally, (Wilton, 2014) has proliferated managerial approaches and metrics to assess student outcomes. The emergent Teaching Excellence Framework in the UK (Office for Students, 2018) intends to include graduate 'employment' within their metrics to assess teaching excellence. Thus, universities have implemented a range of approaches to developing the employability of their students, whether curricular, extra-curricular, or co-curricular.

This paper will outline a rationale for developing a simulation module for criminology undergraduate students, along with a description of how the module was operationalised adopting experiential learning approaches and utilising models of reflection (Schon, 1983, Gibbs, 1988). The module was developed in partnership with practitioners, and adopted six active learning techniques to deliver student centred learning (O'Neill and McMahon 2005):

> outside speakers - visiting criminal justice professionals; criminal justice agency student visits; the provision of a reflective student work book; service learning in the form of opportunities for student placements; assessments designed to facilitate student reflection on their own career pathways, and an imaginary case study approach framework for the teaching delivery.

Using summative assessments as a data set, a thematic analysis highlighted from students' own perspective, how their employability and skills have been developed as a consequence of undertaking the module. These include articulating transferable skills (Monks *et al.*, 2009, Pollard *et al.*, 2015; Jackson 2016), personal growth through developing empathy and compassion and the identification of new opportunities. Finally, pragmatic recommendations are made for others contemplating developing similar learning opportunities.

1. Introduction

In the UK, as internationally (Pavlin and Svetlik, 2014), there is an increasing focus on enhancing student employability as an outcome of successful university study. While definitions of employability remain contested, alongside plentiful critique of the purpose of a university education, both outside the scope of this paper, the marketisation of universities in the UK (Wilton, 2014) has proliferated managerial approaches and metrics to assess student outcomes. The emergent Teaching Excellence Framework intends to include graduate 'employment' within their metrics (Office for Students, 2018). Thus, universities have implemented a range of approaches to developing the employability of their students, whether curricular, extra-curricular, or co-curricular. The Department of Law and Criminology at our institution is no exception. This paper will outline a rationale for developing a simulation module for criminology undergraduate students, along with a description of how the module was operationalised. Using summative assessments as a data set, we present findings from a thematic analysis to highlight from students' own perspective, how their employability and skills have been developed as a consequence of

undertaking the module. Finally, we present pragmatic recommendations for others who may be contemplating developing such a module within their courses.

2. This Study

This study has three key aims. First, we provide a context for the development of the simulation module that was created as a consequence of university drivers to embed employability within the curriculum. Second, we present findings from a thematic analysis of summative assessments completed by students relating to their learning, adopting experiential learning approaches, and utilising models of reflection. Finally, we identify 'lessons learned' for this specific module, and for others who may be wishing to implement a similar initiative within their curricula.

2.1. Module Delivery And Rationale

A revised organisational strategy, which required employability to be embedded within the degree, and new QAA benchmarks for the course, provided an ideal opportunity to develop innovative approaches to teaching and learning. Building on the extensive pracademic expertise within the department (Posner, 2009), this module was developed in partnership with practitioners, recruited via an event held within the department designed to enhance links with practitioners across teaching provision. The module deployed a social constructivist approach to learning whereby students are exposed to communities of practice to shape knowledge (Rust *et al.,* 2005), and utilised six active learning techniques (O'Neill and McMahon, 2005) in order to deliver a transformative learning experience (Mezirow, 2009):

— outside speakers - visiting criminal justice professionals
— criminal justice agency student visits
— a reflective student work book
— assessments designed to facilitate student reflection on their own career pathways
— an imaginary case study approach framework for the teaching delivery
— service learning in the form of opportunities for student placements

Practitioners worked collaboratively to develop a detailed, real-world, real-time simulated scenario (Goulette and Denney, 2018; Werth, 2009), taking in all aspects of the criminal justice process, from incident to release from custody. Within the teaching schedule, practitioners delivered lectures and seminars, firstly to provide an overview of their role within the criminal justice system, and secondly to work with students to progress the scenario. This included input from: crime scene investigators, police officers, Crown Prosecution Service, Victim Support, the judiciary, probation officers and prison officers.

The students enrolled on the module were level 6 undergraduate (final year) students studying either single honours criminology, or joint honours with psychology or sociology. Throughout the module, in addition to receiving face to face teaching, students received 'information drops' via the virtual learning environment, timed to be released at any time, day or night. The purpose of this was to reflect the realities of the working environment, whereby incidents may occur at any time.

Students submitted two pieces of summative course work. The second piece of coursework formed the thematic analysis for this study. The assessment required students to

select two agencies whose work had been presented in the module and to write a reflective account/consideration of three elements: how the work differed in reality to pre-conceived ideas; what skills are necessary to work as practitioners in the agencies selected, and how skill development can be evidenced. This necessitated a reflective approach being adopted within their assessments (Schon, 1983; Gibbs 1988).

2.2. Thematic Analysis of Assessment Papers

The assessment papers were submitted electronically. Seventy-six documents were retrieved and downloaded for data analysis. Thirteen (17%) documents were from male students and sixty-six documents from female students (83%). This over-represents the gender gap in social studies course nationally (HESA, 2018) but is consistent with gender differentials within our courses over the past five years. The documents were opened, anonymised, given an individual code, and securely stored by the research team.

Following Braun and Clarke (2006), a thematic analysis was conducted in order to ensure that that the theoretical framework and methods match what the researcher wants to know. In this way, a realist method (King and Horrocks, 2010) was adopted, which focuses on reporting experiences, meanings and the reality of the student participants. The assumptions about the nature of the data have been made explicit. The documents analysed are credit-weighted assessment submissions by undergraduate students in the third year of their degree. Whilst this may have impacted on any explicitly negative comments about the delivery of the module, the assessment was designed to encourage the students to reflect on their *own* experience gained during the module and relate this to their own personal and career development, thereby ensuring students writing was focussed on the impacts on them, not module delivery *per se*.

Each member of the research team individually read and identified themes from ten randomly selected assessment submission documents. A checking exercise was then conducted to agree the coding tree to be utilised in NVivo qualitative data analysis software. This acknowledges the active role that researchers play in identifying patterns and themes by selecting those of interest (Taylor and Usher, 2001).

This qualitative approach to analysis did not treat prevalence of a theme as necessarily meaning that the theme is more significant than another theme (Braun and Clarke, 2006). Prevalence was counted at the level of the data item (i.e. did a theme appear anywhere in each individual document) rather than adopting a content analysis approach (Wilkinson, 2000). Methodologically the themes identified are an accurate reflection of the content of the entire data set (Braun and Clarke, 2006: 83). The thematic analysis was theoretical or deductive, a top down analysis of the data (Hayes, 1997), driven by the explicit analytical interests of evaluation, which resulted in coding of the data to address the specific research questions.

3. Findings

From the thematic analysis, three main themes were identified which will be discussed in this section: identification of transferable skills; personal growth - empathy and compassion, and identification of future opportunities.

3.1. Transferable Skills

The data contained evidence that students were able to identify some transferable skills (Monks *et al.*, 2009: 78) in the sense that some of the skills identified were of a generic nature which could be transferred to other employment sectors. The key skills identified by students were:

— Good organisational, administrative and observational skills.
— Excellent communication and interpersonal skills.
— A non- judgemental approach and an awareness of diversity issues.
— The ability to work in a team and under pressure.
— Emotional resilience and a sense of humour.

Rust (2016) identifies that the ability of students to articulate such skills acquisition is fundamental to employability, therefore it is worth noting that some student's acknowledged the transferability of the skills they had identified more clearly than others:

> "I believe that they will be conducive to any career which I may pursue in the future." (P15)
>
> "I believe it requires someone who understands the importance of confidentiality as well as a commitment to diversity and work well within a team. Saying this though, I think these skills are vital to possess for many jobs today." (P3)
>
> "Over the duration of my time at University and through other activities outside of education I believe I have acquired and begun to develop some of the key skills needed to work in the Criminal Justice System and indeed any other type of job." (P58)

However, as a result of being asked to compare and contrast the skill sets required for two different agencies, student data illustrates that some had begun to actively process and align professional skill-sets required for working in the criminal justice system:

> "Similarly to the work of prison officers, I found that compartmentalisation and mental strength of what is seen daily is needed to work in that profession." (P53)
>
> "The necessary skills for a probation officer as similar to those required for prison officers." (P62)

3.2. Personal Growth- Empathy and Compassion

A further observation that can be made from the student reflection data set is that for some students, the personal growth they experienced during engagement with the module had a significant effect on them. For example in terms of the individual student's perceptions regarding developments in their own capacities for empathy, patience and compassion, which resulted in positive-trusting relationships being formed with the people they worked with:

> "My role in the prison was a mentor, this meant I was assigned an inmate prior to his release in order to help him get ready for his release and advise him

on any issues he may have. Many prisoners I worked with stated how they had found it helpful knowing that they had someone on the outside to help them once they had been released and to help them settle back into life in the community." (P39).

"Volunteering as an out-reach support worker with isolated youths, it is essential to be able to communicate with them in a way that they understand and also be able to listen to and understand them in order to form a relationship which is needed" (P4).

"I feel that over the course of my studies, I have developed a more in depth knowledge around the pains of imprisonment, which has allowed me to express empathy, patience, and compassion when dealing with offenders during my voluntary position at Catch 22" (P46).

"The skills I have acquired recently are those of a better understanding of individuals facing mental health issues, and a less judgemental bias towards problematic individuals. These skills have been acquired from my involvement in volunteering for SOVA and there Appropriate Adult opportunity." (P43).

It is argued that it is important for students to gain the opportunity to gain a realistic understanding of offenders in order to address misperceptions (Hirschinger, Blank and Markowitz, 2007: 69). This is particularly important for the early learning experiences of those who may work with vulnerable groups within the criminal justice sector, who may have experienced issues relating to trauma, substance misuse or mental health. The importance of assisting individuals in moving beyond stereotypes and to view other groups of individuals in a more compassionate manner and assist in diversity-based learning outcomes will be a vital skill in the workplace and is often assessed at recruitment:

"Coming into contact with ex-offenders on several occasions on the course has helped my ability to not judge offenders for their offending behaviour." (P1)

"Before I started studying things such as prisons and crimes my views towards prisons and inmates was very one sided. However now I have learnt more about crimes committed and what prison is like, I feel I could work in this kind of environment and not be as judgemental towards prisoners as what I used to be." (P49)

This situation can be described as indicative of the reported impact of service learning, where exposure to other cultures and groups is considered a form of "transformational learning that may serve as a platform for further growth" (Hirschinger-Blank and Markowitz, 2007: 78). This in turn, may also lead to a future teaching focus on students translating their learning into the behavioural realm of citizen behaviour (Giles and Eyler, 1999:38). Wider Learning, Teaching and Assessment literature indicates the possibility that students may became more tolerant towards others, less punitive and more in support of rehabilitative progress, on exposure to this model of learning experience (Hirschinger-Blank and Markowitz, 2007).

3.3. Identification of Future Opportunities

The student data sample revealed evidence that students moved from reflecting on their skills, to making the shift to basing decisions on their experience of the simulation module, with examples of decisions being made regarding their own future employment options. These self-assessments demonstrate student's utilising their own reflections on their skills-bases to make these decisions and provide examples of increased self-efficacy about their future directions in terms of employment (Monks *et al.,* 2009: 78):

> "I have learnt to be more discriminating, looking behind presenting attitudes of suspects and police officers alike, for the potential causes. Thus, I have a well-grounded basis upon which to base my future career." (P17)
>
> "From my three years at university I have come to the conclusion that the role in the criminal justice system I would most like to work as is a prison officer." (P18)
>
> "I wish to work in rehabilitation of drugs and alcohol following my degree in criminology." (P21).

3.4. Research Limitations

As an internally evaluated piece of work, which focuses on one cohort of students in a single site, there are inevitably a number of limitations to this study. The initial research design included a focus group with students, however this was unable to take place due to the timing of the evaluation, which occurred once students had graduated their course. Although the data contained examples of the results of engagement, future studies would benefit from how reflective writing, *i.e. the process by which,* influenced changing viewpoints.

Given the qualitative findings show the significant impacts on students of engagement with this module, it is recommended that future research also entails quantitative data collection. This could include the extent to which any changes in attitudes were identifiable across the student cohort, across different teaching levels and over a number of years of intake. (Monks *et al.,* 2006).

Although the research identified evidence to suggest the module has had effects on attitudes, it is difficult to establish the *extent* to which students were reporting their attitudes being changed as a result of lack of correlating factors. This limitation could be addressed through the collection of base line data (i.e. pre-engagement data, along with post-engagement data) in order to provide a robust assessment of the extent to which attitudinal change can be attributed to the module.

4. Recommendations

Delivering a module such as this requires engagement from staff within the department and excellent links with local agencies. There are a number of significant resource implications to be considered, such as: working collaboratively with professionals to prepare the scenario; coordinating guest lectures and timetabling; preparing for, and attending visits with students; posting scenario updates; developing a workbook which captures scenario

content alongside opportunities to articulate learning and reflection. Students also require support to not only 'make sense' of the pedagogy, but the nuances of the case, and how to relate their experiences to being able to write reflectively. However, none of these resource issues are insurmountable with faculty support and dedicated staff. As debates move away from the production of technocratic lists of skills, towards questions of identity and broader attributes, modules such as this provide opportunities to facilitate the transition "from the identity of a student towards that of a graduate worker and citizen" (Artess, Hooley, and Mellors-Bourne (2017, p. 7).

5. Conclusion

This research has presented data which demonstrates through students' own words, the impact that studying the module has had on their learning and skills development, underpinned through the utilisation of six active learning techniques: outside speakers in the form of visiting criminal justice professionals; criminal justice agency visits; a reflective student work book; service learning in the form of opportunities for student placements; assessments designed to facilitate student reflection on their own career pathways and an imaginary case study approach-framework for teaching delivery.

This style of delivery provided unique simulated learning opportunities from which students derived a sense of enjoyment, relevance and confidence, along with fulfilling the module learning outcomes. Students recognised the centrality of the challenging choices they had to make, which required the input of their own judgement in the case study assessment design. They gained real-world experience and insights into this sector from their engagement with professionals, site visits and innovative assessment designs. This resulted in enhanced motivation, inspiration and increased interest, alongside engagement in reflective assessments which highlights the realities of enquiry based learning that they have experienced. Students articulated a range of benefits of being taught by professionals from the CJS, which led to an informed understanding of how the CJS works. The experience of the simulation module has impacted on students' perceptions regarding their own employability and increased self-efficacy about student's future directions in terms of employment.

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Students as Partners in Redesigning and Delivery of the Curriculum

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ABSTRACT

Student-Staff Partnership (SSP) encapsulates the pedagogy of teaching and learning in various settings through student-staff reciprocal partnership practices in the Higher Education (HE) sector. The application of SSP for successful redesigning and delivery of the curriculum can be traced across various disciplines in a number of pedagogical contexts. This paper narrates a case study of how educators can partner with first year undergraduate students to redesign and deliver an existing module curriculum through co-creation of e-learning materials for teaching and learning. It also exemplifies how readily accessible digital applications can be used in order to develop students' digital literacy skills and promote inquiry based learning in the process.

An action research project was undertaken to assess the benefits of including specific digital applications in the curriculum in order to promote leaners' digital literacy skills. The impact of SSP as an approach for curriculum redesign, delivery and as a facilitator of research and inquiry skills in undergraduate students was also evaluated in the process through the co-creation of e-learning materials.

A focus group was conducted to capture participants' responses and thematic content analysis was undertaken to data analysis. Findings suggests, using digital applications for co-creation of e-learning materials improved learners' confidence in embracing and using digital applications for learning, communication and dissemination of evidence based information through the process of inquiry and research based learning. Additionally, students found SSP effective as an approach for redesigning the curriculum since it provides a platform to capture students' expectations of the use of relevant digital applications in the delivery of the curriculum to facilitate learners' digital literacy skills development processes. Furthermore, through this project a large database of co-created e-learning materials were generated which were integrated into the module for blended learning and future re-purpose in the delivery of the curriculum.

1. Introduction

As part of a summative assessment requirement of a postgraduate Continued Professional Development (CPD) module, it was necessary to review the existing curriculum design of an undergraduate taught module and apply an action research approach to evidence any weaknesses identified in the curriculum design followed by implementation of a test of change. Using Prideux's (2003) situational model to assess and analyse a curriculum, the curriculum design of a first year accountancy undergraduate module titled as 'Accountants in the Business Environment' was assessed. It was evident that the existing curriculum was designed to be delivered in a technologically well-equipped classroom where students will have access to desktop computers and high speed internet. Though one of the module learning outcomes particularly emphasised on developing students' digital literacy skills in the curriculum delivery process, however, the contexts of the curriculum delivery process in which students' digital literacy skills can be developed and evaluated or the tools that can be used to challenge and stretch existing digital literacy skills of learners, were not clearly defined in the curriculum design.

With access to high-speed Internet, Wi-Fi and the growth in handheld web-enabled 'smart' devices there is a divide between using online technologies for education and using them for leisure. Relatively few students claim to be digital content creators although many

own a web-enabled tablet, laptop or phone with easy access to digital applications for learning (Jones *et al.,* 2012). Neary *et al.* (2013) argued that, focusing the role of students in the co-production of digital materials to support curriculum delivery and personalised learning for their own and others', enhances learners' creativity and turns students and teachers as collaborative explorers in unchartered territories. One of the many approaches to curriculum design is to engage students as co-designers of the curriculum and to include them in pedagogical planning processes through SSP (Bovill *et al.,* 2011; Healey *et al.,* 2014). SSP for curriculum design can be traced in a number of contexts such as influencing courses and university wide curriculum renewal; re-designing a course in the semester prior to teaching it again; and partnering with students in the review of a whole degree program curriculum (Bell *et al.,* 2019).

In order to address the weaknesses identified in the curriculum design of this module, the following aims were set:

i. To engage an existing cohort of first year undergraduate students studying this module in a Student-Staff Partnership (SSP) approach, in order to evaluate the necessity to redesign the module curriculum before it is delivered again in the following academic year;
ii. To co-create e-learning materials with the students for curriculum delivery in order to assess the inclusion of specific digital applications in the curriculum that will enable the process of students' digital literacy skills development.

2. Literature Review

Students' expectations in terms of communication and technology from the university has changed dramatically in the past decade. Most students today, who represent the first generation to grow up surrounded by technology where the internet, computer, phones and instant messaging are part of their lives, are used to communicating electronically though multitasking. On the contrary, academics, described as 'digital immigrants' in some literature, who have not taken certain technological forms for granted, may still be expected to use some of them in the delivery of the curriculum. As such, there may be a gap in the expectations of students' perception of the use of technology in teaching and learning which may be influenced by the place of technology in the society as opposed to those of educators' who may expect students' to learn in the same manner as they did some 20 years ago (Woodcock, 2012; Jones, *et al.,* 2012). This could impact student learning in the class due to possible disintegration in the expectation levels.

Emerging evidences suggests that learners struggle to search and retrieve information from online sources and find time in the curriculum to develop competencies in using digital technology confidently for learning (Buckley *et al.,* 2010). In order to enable students to take control over their learning needs, educators can nurture power-sharing relationship with students over digital contents creation. This can be achieved by treating students as partners, producers, curators, co-creators and collaborators (McPherson & Heggie, 2015; Mercer-Mapstone *et al.,* 2017) of e-learning materials using various educational applications (Terrel, 2017).

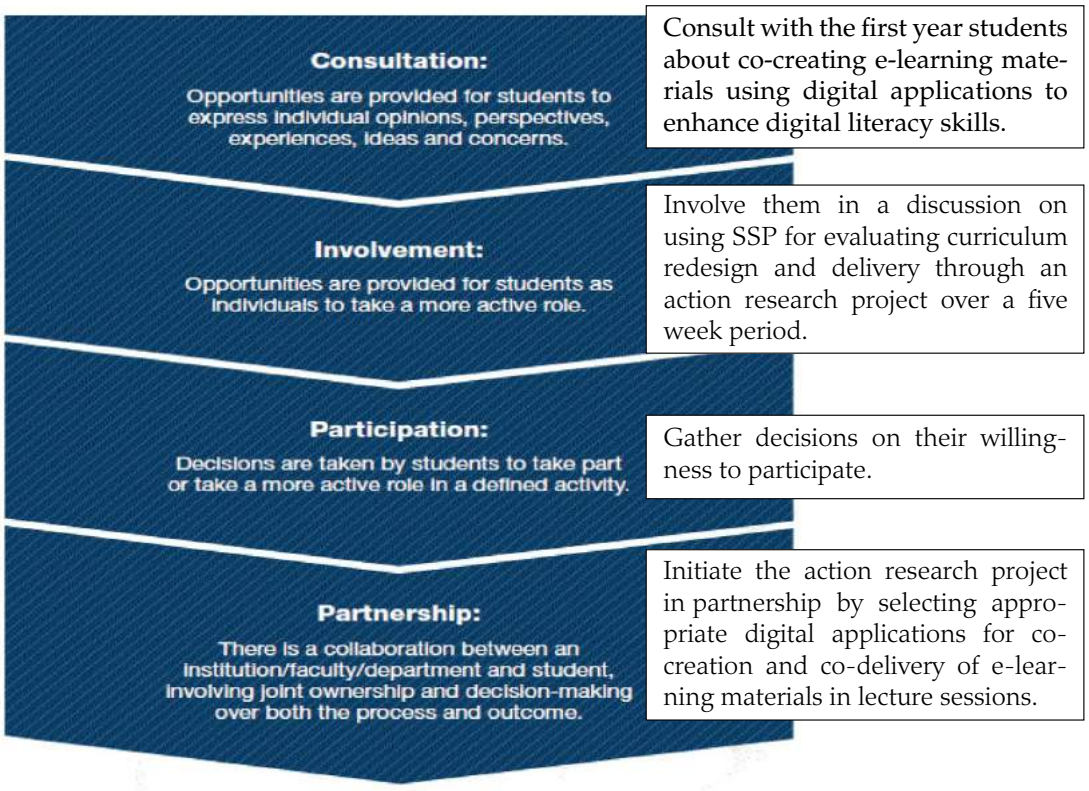
Engaging students in partnership in the designing of digital materials as resources that are suitable for repurpose across different contexts supports learner engagement at different modes. A key criteria however is to ensure students' inform the design and implementation process. Through this measure which is a very old idea of curriculum design, learners set

their own learning goals, manage their learning, appropriates digital applications and media for their learning practice thus embarking on an interactive journey that enables them to develop and acquire learning and digital literacy skills (Greaves, 2012). According to Oddone (2016), the role of technology can be reimagined in education by allowing students to use it for coding, media production, design and peer collaboration so as to transform learners from passive consumers of digitized learning materials to active consumers.

The benefits of engaging students in producing and creating e-learning materials using digital applications is manifold. It is linked to institutional virtual learning environments (VLEs) to scaffold learning, promotes from peers through sharing (Van Dijk & Lazonder, 2016) and also generates carefully crafted e-learning materials designed to support learners. These learning materials can be used either in tutor-mediated or personalised contexts and would reduce the pressure on staff for repeated delivery of the same information (Greaves, 2012). Thus, employing this initiative would provide a scope to the teachers to design curricula that promotes digitally enriched learning environment and provide opportunities for learners to develop their digital bravery skills to survive in a digitally connected world (Terrel, 2017).

Healey *et al.* (2014) suggested a holistic process to engage students in partnership for co-designing of the curriculum. This process will be applied (as illustrated in *Figure 2.1 Four stages of engaging students in partnership*) to set the scene for addressing the problem identified with the module curriculum design in order to work in partnership with the students using an action research process as defined by Millwood *et al.* (2009).

Figure 2.1
Four stages of engaging students in partnership



Healey *et al.*, 2014.

It must be stressed here that SSP has been described as more of a process of doing things rather than a measure for the achievement of predetermined outcomes (Mathews, 2017; Healey *et al.,* 2014). Some findings reported that SSP may re-inforce pre-existing power inequalities and the feeling of vulnerability among students and staff (Mercer-Mapstone *et al.,* 2017). Students' 'fixed' assumptions of their role expectations before entering the university may make it difficult for them to comprehend or appreciate working in partnerships with tutors and this may prevent them from engaging in SSP and explore its potential for teaching and learning (Rakrouki *et al.,* 2017). Nevertheless, 74% of the existing literature on SSP highlighted personal development of both staff and students with the potential to enhance skills, motivation, creativity, staff-student communications and self-efficacy as some of the key outcomes of the partnership process (Matthews *et al.,* 2017).

3. Method

The dissemination of the action research project involved collaborating with 35 first year undergraduate students studying the module in semester 2 of the academic year 2017/18. The project spanned over five weeks. In the final week, all 35 students enrolled on the module were sent an e-mail inviting them to participate in a focus group since this method of qualitative data collection has proved to be popular with those running pilot tests for curricula or program development and outcome evaluation (Leung & Savithiri, 2009). The focus group questionnaire consisted of 10 open-ended questions that were adapted from Curran (2017) and Mathews, *et al.* (2017). The questions were designed to capture students' perspectives on the need to be digitally brave through exploration of digital applications for learning and its inclusion in the curriculum; the impact of SSP as an approach for curriculum redesign; any changes they may have observed in their inquiry skills and learning processes as a result of this partnership.

6 students in total participated in the focus group which lasted for a duration of 45 minutes. Thematic content analysis as described by Braun and Clarke (2006) was applied to analyse the responses received to search for themes, define and name them and to select compelling examples (Bell *et al.,* 2019). A summary of the digital applications that were used for this study is illustrated below in *Table* 3.1 *Digital applications used for co-creation*:

Table 3.1
Digital applications used for co-creation

Weeks	Digital applications	Functions	Instructions Given	Outcomes
1	**Sutori**	A student centered approach for Collaborative learning for the flipped classroom using timeline presentations for storytelling (Sutori, 2019).	Use Sutori to independently collate and organise various online resources relevant to a module topic in the form of a personalised storyline and present in the classroom.	A database of online resources collated by the students for classroom delivery as well as repurpose for online blended learning.
2	**Canva**	A graphic-design tool used for both web and print media design and graphics. It enables users to access over a million photographs, graphics, and fonts and use them by applying a drag-and-drop format (Canva, 2019).	Use Canva to work in pairs to create an infographic on a module topic and present it to fellow students and the tutor to generate group discussion.	A compilation of infographics co-designed and created by the students, which can be used for the explanation of theoretical concepts in future delivery of the module topic.
3	**PowToon**	A readily available application that enable users to create videos individually or in collaboration in order to captivate, engage and explain (PowToon, 2019).	Students to collaborate by working in small groups in order to create short length interactive videos on PowToon to explain a number of module topics to the class.	A selection of online educational videos co-designed and created by the students for classroom delivery as well as for online blended learning.
4	**Prezi and Kahoot**	Prezi - A presentation application that provides the scope to create and publish interactive presentations online (Prezi, 2019). Kahoot -An application that provides a platform for game based learning that is particularly suitable for designing formative assessment activities (Kahoot, 2019).	To co-deliver a lecture session with the tutor using these applications. Students worked in partnership with the tutor to discuss the scheme of work including for the topic selected.	This process involved the students in setting the learning objectives for the selected topic and selection of formative assessment activities to assess learners. This enabled the students' who co-delivered the teaching and learning session to extend their skills and awarenesses of behind-the-scenes curriculum development processes at the university (Bell et al., 2019).
5	**Loop**	A digital feedback application that enables tutors to capture student voices in real-time in order to adapt classrooms to maximize learning outcomes and gather evidence to support impact (Loop, 2018).	This application is accessible on smart phones as well as desktop computers. The focus group participants were asked to download and install the application on their smart phones prior to the focus group session so that they can access the questionnaire during the session using a code generated by the application.	Using this application enabled participants to record their responses quickly and easily using their smart phones. It also saved time with data transcription since a feature of this application enables quick import of data onto an external spreadsheet such as Microsoft Excel for analysis purposes.

4. Results and discussion

Four themes were apparent from the analysis of the responses received. These themes are listed below with descriptions and selected illustrative examples from the focus group responses. Focus group participants have been referred to as participant 1, participant 2 and so on.

4.1. Benefits of including digital applications in the curriculum design

When asked to reflect on the extent to which the existing curriculum of the module 'Accountants in the Business Environment' provided them with opportunities to explore digital applications, participants responded that the scope was quite limited to only exploring Microsoft Office applications in the current curriculum design:

> ''Currently I have to say not enough at all, because I am really keen to explore more on how to use digital applications. It helps us improve our Information Technology (IT) skills and enhance employability skills. I hope the inclusion of digital applications for delivering the curriculum will be considered in other degree modules too''. (Participant 6)

Participants appreciated the necessity to be digitally brave and gain proficiency in using digital applications for learning since they believe it will enhance their employability skills by improving their IT skills. The student participants thought that it is imperative for institutions to ensure that the design of the curriculum maps students' digital competence levels with the expected levels of the graduate job market and that students are provided with the opportunity to further their digital proficiency levels through exploration of relevant applications in the process of the delivery of the curriculum. This resonates with arguments made by Woodcock (2012) and Jones *et al.* (2012) on the shift in students' expectations of the use of technology in teaching and learning.

Below are some opinions expressed by the participants when asked about the importance of digital bravery for undergraduate students in the HE sector:

> ''It is extremely important for every student to be digitally confident because everything we do is digital, at work, school and home''. (Participant 4)

> ''Very important, as the fear of exploring the digital aspects may delay many situations. Technology is a fast growing industry and the more practice the better''. (Participant, 5)

4.2. Impact of using digital applications for learning

All the focus group participants reported positive outcomes from the use of digital applications for learning and co-creation of e-learning materials. They felt that the implementation of digital applications in the learning process has enabled them to understand and apply theoretical concepts to contexts in relatively shorter span of time and encouraged them to think creatively which supports existing findings from literature (e.g Neary *et al.*, 2013; Greaves, 2012; Van Dijk & Lazonder, 2016). Two out of six participants expressed that they felt challenged with regards to using the digital applications for learning

in a time restricted session but this enabled them to identify weaknesses in their time management skills and take initiatives to develop these weaknesses:

> ''Yes, challenges were to manage time effectively and communicate effectively using new platforms, but had the opportunity to explore and work on my weaknesses''. (Participant 3)

However, majority of the participants felt this process of learning made them think more creatively since they could do multiple tasks with limited time and effort using the digital applications:

> ''I found it inspirational to be able to explore new digital applications in order to produce e-learning materials. It supported me in thinking creatively about learning new concepts''. (Participant 1)
>
> ''It increased my confidence in using technology for learning thus enabling me to be more creative in selecting the right medium for assessing my knowledge level''. (Participant 3)

Participants also felt that this initiative has helped them to gain relevant knowledge about how to appropriate readily accessible digital applications through laptop, desktop computers or smart phones for learning as well as to create digital learning materials and become active consumers of technology in the process rather than passive (Oddone, 2016). Some have exclaimed it to be an experience they have not encountered before and an initiative that has certainly helped to build their confidence on using technology for learning actively beyond the periphery of the classroom in a digitally connected world as suggested by Terrel (2017).

4.3. SSP as an approach for curriculum redesign

Participants were asked to reflect on their experiences of engaging in SSP for redesigning the curriculum and its delivery. From the responses gathered, it appeared that the students perceived SSP to be an excellent way to assess and establish the necessity to redesign an existing module curriculum. Participants felt that SSP provides a suitable platform for student-staff collaboration to co-create digital contents for curriculum delivery since SSP values students' voices:

> ''I will be glad to see student-staff partnership be made compulsory in many higher educational institutions because I believe it will be of major benefit to all students in many ways''. (Participant 1)

Participants also felt that the SSP provided a relaxed, interactive and collaborative learning environment that encourages more student participation in the class in order to explore various skills development processes such as collaboration skills, communication and presentation skills. They also felt that SSP builds a healthy relationship between staff and students through effective communication. Engaging in partnerships made the participants feel good about being part of a project and actively learn in the process. These findings support the notion of engaging students in SSP (Bovill *et al.,* 2011; Healey *et al.,* 2014) for successful redesigning of the curriculum as emphasised by Bell *et al.* (2019):

> ''SSP is a good method to learn from each other''. (Participant 4)
>
> ''Although some students like myself prefer to learn independently than in collaboration, I still found SSP as a brilliant initiative since I believe it changed my perception of university experience the more I got involved in this project''. (Participant 3)

Three of the participants however expressed that they did not feel any change in the way they interact with staff and other students during the partnership engagement process due to pre-existing levels of seniority between staff and students. As stressed by Mercer-Mapstone *et al.* (2017) and Rakrouki *et al.* (2017), these participants thought that the power hierarchy between staff and students would seldom change in any staff-student partnership setting since some students would still consider their tutors as their superiors in the power hierarchy and as such treat them with the same respect that they would in a non-partnership setting. Due to this reason, some of the participants believed that students may not feel entirely confident in voicing their opinions while engaging in SSP initiatives.

4.4. SSP for developing inquiry and research skills

Participants' responses were mostly positive when inquired about the impact SSP had in the development of their independent inquiry skills through co-creation of digital contents:

> ''It is motivational to be able to actively contribute to self-development through SSP since it made me reflect on my enquiry skills while working with others''. (Participant 2)
>
> ''SSP has motivated me more towards my academic work. I have gained research skills and communication skills that will help me though my studies''. (Participant 6)

Participants also believed this particular SSP initiative provided them with an opportunity to develop better relationships with fellow student partners and gain the confidence to be more competent in expressing concerns and asking questions. Some felt that they have experienced the best method of learning and developing their inquiry skills though this collaborative partnership process of teaching and learning which supports findings from existing literature (e.g. Healey *et al.,* 2014; McPherson and Heggie, 2015; Mathews, 2017; Matthews *et al.,* 2017;):

> ''SSP is a key opportunity to enhance academic progress for a better future. For example, new e-learning materials have been co-created and delivered by students in the class. This additional knowledge gained will help students to experience new technologies to learn independently''. (Participant 4)

5. Conclusion

Findings from this case study indicate that SSP as an approach proved to be effective in evaluating the necessity to redesign a module curriculum to embed digital applications for learning and promoting learners' digital literacy skills. It is evident from the perspectives

gathered from participating students that the inclusion of digital applications for curriculum delivery enabled students to gain new knowledge on co-creation. SSP provided an engaging platform for both students and staff to explore, challenge and nurture their digital literacy skills in addition to building confidence in using technology proficiently for teaching and learning, communication and dissemination of information. A limitation of this study is the size of the focus group involved in the evaluation process. To address this issue, it would be beneficial to conduct another cycle of action research in the academic year 2018/19 for this module and use a mixed-methods research design to enable data triangulation and to gather further empirical evidence to support the rationale for redesign the module curriculum. It would also be useful to undertake a systematic review of SSP literature to identify effective processes in shifting the barriers of power hierarchies in order to make the partnership process more evocative.

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Enhancing student engagement through interdisciplinary, international field-based research that tackles global issues

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Abstract

Research results over the past decade, investigating off-campus field-based learning, agree with Colby *et al.* (2003) that potentially rich experiences, across the disciplines, can sometimes result in shallow learning. Although students have positive feedback regarding fieldwork, they report a lack of confidence in carrying out independent fieldwork, and can't always demonstrate robust understanding. It turns out that students were often not challenged enough and learning outcomes were not always aligned with assessment and pedagogy (Higgs, 2013, 2015). This can lead to a gap between students' abilities and students' actions. To narrow the ability-action gap, Ritchhart (2002) called for students to have the opportunity for practice and reinforcement within meaningful contexts. A 3-year funded Erasmus+ project aims to do just that, with courses for students offering interdisciplinary and international field-based group research projects that address global concerns. In a novel approach, field-based courses for teachers in approaches to curriculum design and logistics are also being piloted. Among the research questions being investigated are 'what are students' perceptions of the added value of field-based research that includes interdisciplinarity and internationalisation?' and 'what are the international, interdisciplinary threshold concepts that students must grasp?'. This investigation will help us recognise the impact on student learning. Pre- and post-course questionnaires have been devised to gain insights into the impact of the initial courses on students' engagement, attitudes to learning, perceptions and concept development. Students will conduct surveys of their cohort to assess impact. Initial research has identified unexpected, as well as expected, cultural differences in approaches to curriculum design, assessment, pedagogy and staff development, not only between countries in Europe, but also between disciplines. This identified common areas of good practice, as well as areas that need reform. Evidence-based good practice examples helped to mediate and inform decision-making. As a measure of success, the added value of interdisciplinary and international field-based research will be seen in students' greater engagement and greater capacity to view an issue of concern from multiple perspectives. Monitoring changes in student perceptions of these approaches will be an important factor in designing courses going forward.

1. Introduction

Field-work is a resource intensive activity, and so finding ways of maximising the student learning that takes place is a worthy goal. Research results over the past decade, investigating off-campus field-based learning, agree with Colby *et al.* (2003) that potentially rich experiences, across the disciplines, can sometimes result in shallow learning. Research indicates that field-course preparatory work is sometimes lacking, students are often not challenged enough in the field, student voices are not heard, and learning outcomes are not always aligned with assessment and pedagogy (Higgs, 2013, 2015). This can lead to a gap between students' abilities and students' actions. To narrow the ability-action gap, Ritchhart (2002) has called for students to have the opportunity for practice and reinforcement of concepts within meaningful contexts.

A 3-year Erasmus+ funded project (IFiT) aims to do just that, with courses for students offering interdisciplinary and international field-based group research that addresses global

concerns. Experiences from field-based learning interventions from 4 countries are being shared and used to inform the project. Working in interdisciplinary teams is also a challenge for field-course leaders. For this reason, field-based courses for teachers are being designed with the main focus on pedagogy.

Field-based learning is an umbrella term for several disciplinary practices, such as community-based learning, work-placement, clinical practice, and archival research to name but a few. The current investigation involves residential field-based learning in the natural and social sciences. In the natural sciences the 'field-base' is the natural outdoor laboratory. In the past, the lecturer may have been tempted to 'tell the whole story', and the student could be forgiven for thinking that the learning outcomes were "students will be able to take good notes, in adverse conditions, as the leader points out what they are looking at". The associated summative assessment may have been a mark given for good notes, thus reinforcing this student perception.

So, how can we effectively challenge students in the field and how can we encourage the student voice to be heard as opposed to the lecturer's voice? In this project we engage students in interdisciplinary and international group research. Members of each group will have varying levels of research experience, and will be challenged to engage in significant peer-learning.

2. Student Participants

A primary aim of the project is to give students the experience of working in interdisciplinary teams, and an opportunity to address, through research, a real issue of concern to society today. The concern may be primarily local, for example researching a specific local conservation issue, or it could be national or international, for example to gain a better understanding of human impact on the natural environment and implications for climate change.

Seventeen students were chosen to participate in the first course, 8 from Ireland, 8 from Portugal and 1 from Germany. Through the application process, and in a pre-course questionnaire, information on the academic background of the students was collected before they began the course, to inform the detailed planning of the curriculum. The project partners (from 4 institutions) each identified themselves wholly with one discipline as either biologist, geologist, or geographer. An assumption of the project partners was that students would also do this.

Early analysis has shown that (to a greater extent than expected) the students who have applied are already exposed to interdisciplinarity. They are a diverse group. For example, students have studied engineering with biology, or geography with geology. Those who have studied biology may have also studied geology or ecology as their subsidiary discipline. Many had studied integrative sub-disciplines such as palaeontology or marine biology.

Students' reasons for applying to undertake the course were also informative. An engineering/biology student recognised he had 'a gap' and wanted to build and integrate an understanding of geology. He was hoping to begin to address this need on the course. Several students indicated that experience of working in interdisciplinary teams would be beneficial to finding future employment, while others noted that solving the problems/ challenges that may present themselves in the future is unlikely to be done from the perspective of one discipline alone. One student is aiming to become an oceanographer, a

career that requires a high capacity of integrative thinking and learning, not only in natural sciences but also in chemistry and physics.

Table 1
Indicating diversity of the student cohort participating in the field-based learning course

Student cohort		
Male Female	8 9	(6 from Portugal; 2 from Ireland) (2 from Portugal; 6 from Ireland; 1 from Germany)
Total	**17**	
Degree level		Major subject
undergraduate	11	Biology, Geology, Earth Science, Environmental Science, Geography, Engineering
postgraduate	6	3 Taught Masters, 2 Ph.D., and 1 PG Cert.; Specialising in Marine biology, palaeontology, environmental geology etc.
Additional skills		Include: Film-making; work experience in government agencies; work experience in industry

The diversity of the student participant group is indicated in Table 1. There are 11 undergraduate B.Sc. students, and 6 postgraduate students. Interestingly, not all of the students are from the home country. In the Ireland group, for example, one student is Spanish and thus adds to the diversity of the cohort. A number of students are studying as a second career choice, and so bring other skills with them. For example, film-making or interacting with government agencies. It is hoped that these additional skills will be well utilised during the research and in the culminating presentations. The students will be encouraged to use their skills to contribute resources to the project website.

An innovation of this course is that undergraduate students will carry out field-based research in teams that include postgraduate students. It was important to know students' prior experience of research, for example in carrying out literature reviews, devising research questions, designing research methodologies, collecting and analysing data, and deriving conclusions and implications. The pre-course questionnaire informed the partners that in general the undergraduate student participants had little experience of carrying out research. Some students describe the experience of writing literature reviews, and one student notes the completion of a 3rd-year 'research skills module'. Postgraduate students detail the undergraduate final year project as their first substantial involvement in a research project. In the final year project, some students did not develop their own research question, and some followed a methodology that was devised by a supervisor. It was clear that all students, including postgraduate students, felt they needed experience and guidance in developing a research question. This valuable information will inform the design of the residential course. The impact of this postgraduate experience on undergraduate students, their research skills and their ability to make meaningful connections between disciplines and sub-disciplines will be closely monitored, against a set of success criteria.

To assist all students, the field-based research teams will have access to, and be facilitated by, the course leaders who have many years of experience as disciplinary academics. In addition, external stakeholders with a broad range of skills will interact with research teams, to give feedback on projects at crucial stages.

3. Curriculum Design

Europe has a particular challenge in international collaboration for scholarship of teaching and learning. This is the challenge of language and cultural diversity. Initial research identified unexpected, as well as expected, cultural differences in approaches to curriculum design, assessment, pedagogy and staff development, not only between countries in Europe, but also between the different disciplines. The initial discussions between partners showed that we interpreted the project in different ways, but allowed us to learn from each other and identify common areas of good practice, as well as areas that need reform. Evidence-based good practice examples were used to help mediate and inform the decision-making.

A backward design framework (Wiggins and McTighe, 1998) was used to design the curriculum for the student two-week course. In order to do this the project partners agreed to put on hold the development of particular activities and teaching strategies until the desired knowledge, skills and understanding outcomes for the students had been specified.

4. Defining and Designing the Learning Outcomes

The course is designed around a 2-week immersive residential field experience, where students are facilitated to learn from each other. In innovating the design of this experience the project partners aim to challenge students to work in interdisciplinary international teams and deepen their understanding of the interconnectedness of the natural environment. The partners had to articulate what they really wanted the students to achieve and, from this, they had to design the learning outcomes.

In the first attempt at writing the learning outcomes the partners produced 18 outcomes in an attempt to satisfy the multiple disciplines and cultural preferences of the group. With discussion it was possible to see that there were common threads between the disciplines. Eventually 8 multi-disciplinary learning outcomes were constructed that embraced all 18 of the original list. Of these several were considered to be potential interdisciplinary learning outcomes, and thus began to get to the heart of the innovative aspiration of this project.

The list of learning outcomes was further refined and reduced when a focus on threshold concepts (Meyer and Land, 2006) was applied. Here, the partners had to challenge themselves to answer the question 'what are the key concepts students must grasp to be able to look at global issues in a new way?'. The students will be working in the natural laboratory, a learning space of complexity and uncertainty. The learning outcomes must be broad enough to allow unpredictable learning, and be applicable to a range of natural environments. By using a threshold concepts approach we were able to focus and narrow down these 8 learning outcomes to 5. Cousin (2006) refers to this approach as finding the 'gems in the curriculum'. The learning outcomes will be reviewed after each course, with a view to future courses, and will be informed by the student participants themselves. What knowledge, skills, concepts and understanding is it important for the students to grasp? What will serve them well going forward? What has perhaps been missed in the traditional field courses?

The learning outcomes that link to potential threshold concepts are listed below. On completion of the course students should be able to:

— Work in an international interdisciplinary team to carry out scientific field-based research in a novel field area (*this includes for example building on previous work; developing meaningful research questions; identifying and applying relevant data-collection techniques*).

— Summarise the relevant interconnected scientific features of a field area by making an illustrated sketch/mindmap/graphic of the important elements of the natural and/or human landscape (*this encourages capacity-building for integrative learning*).
— Construct a chronology of events related to the field area (*this could include, for example identification of seasonal cycles, life cycles or geological cycles*).
— Consider scientific, social and economic aspects of the natural environment in the field area by interacting with stakeholders including industry and governmental organisations.
— Disseminate multiple perspectives of the research topic to diverse audiences.

Although the use of diverse technologies in the field will be innovative for most students, they will see that interdisciplinary international team-based research is the main focus of the ambitious learning outcomes.

5. Assessment

In the past, learning outcomes have frequently not been constructively-aligned with the mode of assessment. How will we know if the learning outcomes are being achieved and how will we measure the impact of this course on student learning? One important aim of the project is to help students to make connections between and within disciplines. This requires capacity building for integrative learning. **T**he characteristics of the integrative learner are set-out by Huber and Hutchings (2005). For example, an integrative learner will be intentional in their learning and will

— have a sense of purpose that keeps them on track with their learning
— have explicit learning goals and ask probing questions to achieve those goals
— fit fragmentary information into a 'learning framework' and strive to resolve conflicts in understanding.

An integrative learning rubric from the AAC&U (2009) VALUE project has helped the course team to prepare success criteria for the field-based group research projects. Why is integrative learning of particular importance today? In the words of the students, solutions to tomorrow's challenges will need a high level of connection-making between disciplines and sub-disciplines. In other words, we must build capacity today to be prepared for tomorrow.

One innovation in assessment attempts to detect the contribution of individual students to the success of the group. For this, a rubric has been devised that rewards student attributes such as seeks clarification; volunteers; brings disparate pieces of information together; sees the need for planning; proposes; revises; internalises.

Using these rubrics, students will be able to act as critical friends and grade their team members against a number of criteria. This will facilitate formative peer-assessment and peer feedback. Students invest more in their work when they know a peer will read it and give feedback. The added value of interdisciplinary and international field-based research will be seen in students' greater engagement and greater capacity to view an issue of concern from multiple perspectives. Monitoring changes in student perceptions of approaches to issues of local, regional and global concern, will be an important factor in designing courses going forward.

6. Teaching Approaches

Cultural and disciplinary differences led to differing approaches not only to curriculum design but also to the vision of enactment. It was useful to carry out research and identify good practice that brought colleagues together into a unified approach.

Some cultures favour more didactic approaches. While a certain amount of this can be productive, it was helpful to underpin discussions with questions such as 'what can be *uncovered* and *discovered* by the students themselves?'. As much as possible we wanted to gift the learning to the learner. Other questions asked were 'are there any concepts that students typically find difficult and are there common misconceptions?'. A table of teaching strategies for diverse purposes was designed. This helped us move from the didactic approaches towards strategies for discovery and deeper understanding and replace the lecturer-in-the-field approach with small group seminars-in-the-field. The latter facilitates peer-learning and gives the student voice prominence.

7. Conclusions

The project is in its early stages. Much preliminary work has been done to discover disciplinary and national cultural differences and commonalities. Pre-course questionnaires were administered and students met with each other before the course start-date. The first student weeks will take place in May 2019, preceded by the course for field-course coordinators. The design of learning outcomes, assessments and teaching approaches and activities will evolve as we learn from the students over the 3-year project. Analysis of Initial impact of the courses against success criteria will be presented at Eurosotl19 in June 2019. We hope discussion at the conference will inform our international understanding and cultural contexts and aid European teaching and learning collaborations.

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Imagine, Create, and Bake: The Ingredients to a Successful Faculty, Staff, Student Partner Recipe

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Abstract

The principle of meaningfully engaging students as partners in research has become a hallmark of the scholarship of teaching and learning (SoTL) (Felten, 2013). When students are involved in the research process, they participate as co-inquirers and contribute in novel ways to the development and implementation of relevant questions. Despite calls for students to be engaged partners in SoTL research, interdisciplinary teams where undergraduate and graduate students make authentic contributions to large-scale multi-institutional research projects are relatively rare (Felten *et al.*, 2013; Mercer-Mapstone *et al.*, 2017). Our research team includes a group of teaching-intensive faculty, staff, and students from across five post-secondary institutions in Canada and the United States. Our research activities align with the common goal of understanding the impact of psychological stress in undergraduate students. We have designed well-controlled longitudinal studies that investigate student well-being in a university setting in order to assess and support the creation and implementation of evidence-based policies. To this end, we have successfully worked closely with student partners, many of whom have been recruited from student partnership programs at our institutional teaching and learning centres. This has led to a variety of collaborations with students from diverse educational levels (undergraduate, graduate, post-doctoral) and with varied backgrounds (Science, Social Sciences, and the Humanities). The breadth of our partnerships has led to research questions that are highly relevant to students as well as to policy-makers and educators. Furthermore, input from student partners has informed the implementation of methods that are appropriate to their peers. In addition, many of our student collaborators have acted as full partners in all stages of the research process, from the collection of data to the publication of research reports in the empirical literature. Our presentation will explore the key challenges encountered by the students and faculty in our team and will provide strategies for overcoming obstacles to a successful and authentic student-faculty partnership, particularly in interdisciplinary and multi-institutional research contexts.

1. The student stress research group

In 2015, McMaster University (Hamilton, Canada) initiated a week-long fall semester break to give students a reprieve from their studies and to support their mental health.

Around this time, a group consisting of student support staff, faculty, and postdoctoral fellows began to have informal discussions about the state of student mental health at the university. These conversations were intended to produce a meaningful dialogue about the student experience, particularly in relation to reports that North American post-secondary students consistently exhibit higher levels of psychological distress than the general population (Adlaf, Gliksman, Demers, & Newton-Taylor, 2001)—a problem that has increased in recent years (Booth, Sharma, & Leader, 2015). Across Canada, universities have moved to introduce a multi-day break in the fall term in order to help their students manage their stress and anxiety. The group's discussions culminated in the creation of a research team whose mandate would be to investigate the causes and levels of stress among post-secondary students in order to support the creation and implementation of evidence-based institutional policies.

These initial conversations led to the recruitment of several additional group members, thereby creating a diverse, interdisciplinary, and multi-institutional team with backgrounds in psychological counselling, stress physiology, pedagogical research, and student policy. Although there has been some turnover due to changes in staff positions, the Student Stress Research Group has consistently included a group of collaborators whose research activities and/or professional responsibilities align with understanding student stress. Our research group is focused on three key areas of inquiry: [1] student mental wellness (i.e., Has the fall break altered perceived stress levels in students?); [2] student experience (i.e., What are the major sources of stress for students?); and [3] stress physiology (i.e., Does the fall break help to reduce stress hormones such as cortisol and dehydroepiandrosterone?). To date, this collaboration has been a success, as our team has managed to secure funding from several sources in addition to making meaningful contributions to the literature on the scholarship in teaching and learning (e.g., Khan, Poole, & Beaton, 2018; Poole, Khan, & Agnew, 2018; Poole, Khan, & Agnew, 2017).

2. Our initial group utilized the typical top-down approach

The project was not designed as a student partnership from the outset; instead, this component developed organically. In part, we were members of a teaching and learning centre that was working to develop student partnerships as a major part of its mandate (see https://mi.mcmaster.ca/student-partners-program/). The potential benefits of working with students, from the researcher's perspective, were emphasized regularly, making us aware of the possibilities deriving from students acting as partners in the project. Equally, however, our decision to involve students was centred on the benefits to the students themselves. One team member was a teaching professor who had been approached by several undergraduate students wishing to obtain research experience, either as volunteers or for course credit. We believed that student partnership could enrich our work, as it would enable an ongoing and genuine dialogue that would allow the students to share their diverse perspectives and to provide invaluable insights into the development of our research questions (Mercer-Mapstone *et al.*, 2017). We hoped that this process would help us to re-evaluate our approach from a fresh and student-centered perspective. Through this experience, we aimed to develop a reciprocal relationship with our student partners that was predicated on the sharing of power, risk, and learning (Volk, 2016). Thus began the growth of our team beyond employees of the university.

3. Our research project has expanded to several other universities

While the student partners program at our inaugural institution was integral to our approach, it has not been the only way in which we have partnered with students**.** As our team grew to include collaborators from other universities across Canada (York University, University of Ottawa, and University of Waterloo) and the United States (University of New Orleans), we continued to involve students in the research process, despite the lack of a formal student-partnership program at many of these universities**.** As such, our partnerships with undergraduate students took several forms: volunteers were recruited to help with data collection and the development of research materials; thesis students' participation in this research counted as a year-long course that satisfied the final research requirement for their degrees; independent-study students conducted literature reviews for course credit; and junior students who were enrolled in a research-based course helped with data collection under our supervision. While fewer in number, our graduate student partners also assisted in designing research instruments and collecting data through either volunteer or paid work. Furthermore, some student partners were involved in writing for publication or through presentations at teaching and learning conferences (see *Table 1* below).

Table 1

Distribution of student partners from 2015-2019.
Values indicate the number of students involved in any capacity
in the project as well as the number (and percentage) of students involved
in publications or conferences

	Undergraduate		Graduate	
	Involved	**Contributing to Publication or Conference Presentations**	**Involved**	**Contributing to Publication or Conference Presentations**
Volunteer	4	1	3	2
Employed	5	1	2	2
Coursework	15	5		
TOTAL	**24**	**29%**	**5**	**80%**

In the following sections, we present the five critical ingredients that we believe have been integral to the success of our student-staff-faculty partnership, particularly within the context of our interdisciplinary and multi-institutional research team.

4. Five ingredients to a successful partnership

4.1. Ingredient 1: Student Work Should Be Inclusive, Authentic, and Meaningful

Our student partners came from a variety of different backgrounds, ranging from students enrolled in formalized institutional partnership programs with financial and administrative support, to students who reached out to a project member to express their desire to volunteer or gain supervision for a library- or research-based course. Given this diversity, it was imperative that all students were involved in the project in a consistent, inclusive, and meaningful manner that fit with the "guideposts" of good practice presented

in the literature (Felten, 2013). Since our research was heavily informed by students' perspectives regarding a significant institutional intervention to reduce student stress, we naturally wanted to create opportunities that would allow our student partners to offer their insights and to impact the intellectual direction of the work. This strategy is consistent with the goals presented in the scholarship of teaching and learning (SoTL) literature as an important method for engaging student partners and involving them in valuable work (Matthews, 2016; Felten, 2013). Thus, this approach has governed our work throughout the project.

Nonetheless, the duration of our student partnerships has been a consistent challenge, as the majority of student partners only participated for one academic term (approximately four months). To address this, we held orientation meetings at the beginning of each term to allow new students to integrate into the core team and to obtain sufficient background information, such as relevant research details (e.g., an overview of the project to date, associated challenges, and relevant literature) and administrative guidelines (e.g., coordinating team members' schedules, reflecting on work habits, and expectations regarding communication). In addition, we defined each team member's role (including ourselves) and established personal, professional, and project goals in order to allow our student partners to select tasks that were of interest to them. We worked under the basic assumption that it is important to maintain equality and inclusivity among group members. We felt that, given the power differential that exists between students and university employees, this approach would be particularly critical in the context of student partnerships (Fassinger, 1995; Komarraju, Musulkin, & Bhattacharya, 2010; Welikala & Atkin, 2014).

We aimed to engage our student partners fully and meaningfully as collaborators in the research process. They were involved in data collection, the administration of surveys, designing recruitment strategies, collecting and measuring saliva samples from participants for physiological analysis, and leading focus group sessions. They also analysed the data and provided their perspectives during the interpretation of this project. While some of the students had previous experience collecting and analysing data, others did not; as a result, this experience provided these students with an opportunity for skill development under the guidance and mentorship of other team members, including fellow student partners.

Finally, faculty, staff, and student partners worked collaboratively to disseminate our findings. For instance, some student partners were actively involved in the writing of peer-reviewed journal manuscripts, while others shared our research findings at regional and national conferences (e.g. University of Waterloo Teaching and Learning Conference; Society for Teaching and Learning in Higher Education; Canadian Society for the Study of Higher Education).

4.2. Ingredient 2: Break Large Goals Into Bite-sized Tasks

One challenge encountered by most large teams is meeting deadlines (Antoni & Hertel, 2009; Waller, Conte, Gibson, & Carpenter, 2001). Our timelines were negotiated in a group setting wherein feedback from the entire research team was solicited. Since the primary goal of our project was to investigate student stress levels around the fall break, we only had one opportunity to collect data during each academic year. However, instead of a single substantial deadline, we created a series of smaller milestones to be completed before each meeting. We also adopted the practice of distributing tasks among team members. For instance, when working on a collaborative writing project, each team member was responsible for either reading about a relevant topic in the literature or writing a small

section of the manuscript, which would be reviewed by the larger team during a subsequent meeting.

Our group also fostered an environment where we were permitted to modify deadlines. In team-based projects, it is a reality that tasks will sometimes take longer than expected, external responsibilities will take priority, or personal factors will interfere with progress. In order to minimize delays in reaching our final goal, we encouraged all members to inform the group as early as possible if any changes to original deadlines would be required. When deadline changes were necessary, we discussed what factors had led to the delay (e.g., task is more time consuming than originally thought; task needs to be broken down into sub-components), as this helped us to support each other, build trust, and ultimately achieve our goal of completing larger tasks.

4.3. Ingredient 3: Hold All Team Members Accountable Through Regular Check-ins

Regular and pre-scheduled meetings were important for helping us stay on track. At the start of each semester, we organized weekly or bi-weekly meetings with our student teams so that everyone could gather in one place. The purpose of these meetings ranged from ensuring that tasks required for data collection had been completed, to discussing ongoing data collection and data analysis (techniques and results), to writing manuscripts and preparing for upcoming presentations. Other members of the research team frequently joined in on these meetings via an online meeting portal (appear.in, see https://appear.in). For students, these meetings provided an opportunity to learn how faculty and graduate students thought about experimental design and the organizational steps that are required prior to data collection. They also offered students a chance to engage with the data analysis process; senior thesis students would often complete their data analysis independently and then present their results to the larger group for feedback. For junior students, this discussion served as an introduction to statistical methods.

4.4. Ingredient 4: Use Efficient Communication Tools

At any given time, our research team comprised up to 15 student, staff, and faculty members from multiple institutions. Although all of our team members understood that effective and open communication is a critical aspect of any successful collaboration, three factors made it particularly challenging to sustain: [1] the large size of our team made it difficult to coordinate schedules; [2] few members were consistently available during regular working hours; and [3] our members were located in several different cities. We made use of several tools to ease communication.

A common difficulty of teamwork is that it is sometimes necessary to schedule meetings with some members missing. In such situations, it is imperative that discussions are documented in detail so that absent members can understand how and why certain decisions were made. Our best practices for meetings involved taking minutes and assigning tasks for follow-up. Online document-sharing tools (e.g., Google Docs, see docs.google.com) can be highly effective for this and can facilitate better team cohesion than face-to-face meetings (Hansen, 2016). These systems proved to be integral to our ability to effectively catalogue past conversations, assign future tasks, and keep team members up-to-date on recent changes. At times, we even assigned the recording of meeting minutes to individual student partners to increase their accountability and engagement with the group. All files were stored in a shared Google Drive folder, which was accessible to all team members.

Document-sharing tools also enabled collaboration between team members who lived in different cities or who could not coordinate in-person meetings. Google Docs allowed our team to concurrently write a manuscript while updating all new changes online. This technology helped to prevent missed revisions, which is a relatively common occurrence with more traditional methods of group revision, for example, updating a document and emailing it to other team members, or sharing it in a system that does not maintain a living document (e.g., Dropbox, see www.dropbox.com). We found that having multiple authors contribute to a document not only sped up the writing process, but it also made it feel more manageable.

In addition to facilitating remote collaboration, document-sharing tools can of course be used when all team members are in a single space. However, with virtual collaboration and geographically distributed teams, it is important to have access to systems that enable real-time communication. To this end, our team used instant-messaging systems (Slack, see https:/slack.com/) and videoconferencing systems (appear.in, see https://appear.in; Google Hangouts, see https://hangouts.google.com/), all of which are available at no cost.

4.5. Ingredient 5: Place Value in Psychological Safety

Studies in the field of industrial psychology, where data is collected from professionals in the corporate sector, indicate that high-performing teams tend to have a high sense of psychological safety (Carmeli, Brueller, & Dutton, 2009; Edmonson, 1999). This may be due to the fact that a shared sense of psychological safety empowers all stakeholders to take risks without the fear of seeming incompetent or disruptive. In such settings, each team member feels confident that they have the space to ask a question, offer an idea, make a mistake, and challenge others' ways of thinking (Rozovsky, 2015). Accordingly, all members in our team shared the common belief that every person, regardless of their prior experience, had the capacity to offer unique contributions to the research.

From the outset of each student partnership, we intentionally avoided the use of formal titles and used first names to reduce the power differential in our team. We routinely shared with our student partners the project's history and previous iterations of the experimental design, including the paths that led to successes and those that led to failures. The team collaboratively and openly engaged in the search for solutions to specific challenges, allowing our student partners to observe and participate in respectful disagreement with each other's ideas and, ultimately, to be active members in consensus-building.

5. For best results, handle with care

The emerging literature on student partnerships in SoTL emphasizes the importance of such collaborations (Mercer-Mapstone *et al.,* 2017), but may underreport their complex nature. Students must navigate between the roles of learner and co-inquirer (Welikala & Atkin, 2014) and develop the confidence to speak up and share their perspective with a research team comprised of multiple stakeholders. Student also need to be aware that compared to a traditional course experience, research projects do not have a syllabus made up of weekly tasks laid out on a well-defined timeline. And that research projects are often subject to unexpected changes as a result of external pressures and deadlines (e.g., ethics boards, funding opportunities). Further, it is possible that student partners may interpret the inherent challenges of research (e.g., participant recruitment and compliance, null findings)

as a waste of time or a failure, or there might be a mismatch between students' expectations and the realities of how much time is required to complete a research project. Indeed, while faculty and staff may devote months or years to a project, students will often be limited to a single semester of work, thus only seeing small-scale accomplishments within the larger project.

One challenge of allowing student partners a great deal of autonomy is their ability to make key decisions about sensitive issues (e.g., data management, engaging with participants) without consulting the team. Despite equality across team members, the principal investigator is ultimately responsible for ethical and appropriate management of the project. Staff and faculty may therefore need to juggle between the role of supervisor and partner; this could be particularly difficult for someone new to the partnership experience. Nonetheless, a recent review of student partnerships reveals predominantly positive experiences: 74% of papers reviewed reported no negative outcomes for students, and 85% reported none for staff (Mercer-Mapstone *et al.*, 2017).

The current climate in SoTL makes it critical to develop strategies that will facilitate successful and productive teamwork. Given its interdisciplinary nature and the fact that many SoTL researchers enter the field as a secondary line of research, SoTL particularly benefits from teams comprised of members from a variety of fields, roles, and institutions. We recommend that the literature on student partnerships presents a balanced perspective of the experience, including discussions of the benefits and the challenges for all involved.

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Diseño de itinerario para una formación en investigación en el Grado en Biotecnología de la Universidad Francisco de Vitoria

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Abstract

A fundamental aim of the Biotechnology degree in the UFV is to offer students a solid research skill training, in order to provide them with a better access to the labour market in the biotechnology sector. To achieve this goal, we consider essential that the student, in addition to acquiring a deep knowledge of the theoretical contents, receive an excellent practical training. Therefore, the structure of the Biotechnology programme has a practical training itinerary, continuous throughout the degree which allows the student to acquire technical, methodological, personal and participatory skills. This itinerary includes the following training stages: *Practical Classes, Theoretical subjects, Integrated Laboratories, Research Project,* y *Prácticas en Instituciones*. The assessment of this practical training is obtained partly through the satisfaction surveys of students, but mainly through the feedback of the tutors of institutions that receive students in external internships.

Resumen

Un objetivo fundamental del Grado en Biotecnología de la UFV es ofrecer a los alumnos una formación que les capacite para incorporarse al mundo laboral del sector biotecnológico. Para lograr este objetivo, consideramos esencial que el estudiante, además de adquirir un conocimiento profundo de los contenidos teóricos, reciba una formación práctica de excelencia. Por lo tanto, los planes de estudio del programa de Biotecnología incorporan un itinerario de capacitación práctica, que se extiende a lo largo del grado y permite al estudiante adquirir habilidades técnicas, metodológicas, personales y participativas para el desarrollo de su profesión. Este itinerario comprende las siguientes etapas formativas: *Clases prácticas, Asignaturas teóricas, Integrated Laboratories, Research Project,* y *Prácticas en Instituciones*. La valoración de la formación práctica adquirida con este itinerario formativo se obtiene a través de las encuestas de satisfacción, de alumnos, pero principalmente de los tutores de instituciones receptoras de alumnos en las prácticas externas.

1. Introducción

El Grado en Biotecnología de la Universidad Francisco de Vitoria (UFV) se puso en marcha en el curso académico 2009-2010, curso en el que se implantó para sustituir a la Licenciatura en Biotecnología, que se llevaba impartiendo en la Universidad desde el curso 2003-2004. Para la redacción de la memoria de verificación y el diseño del plan de estudios del grado se tuvieron en cuenta las competencias que se recogen en el libro blanco de Bioquímica y Biotecnología publicado por la ANECA, así como los informes publicados por la Asociación Española de Bioempresas (ASEBIO). Por otra parte, el plan de estudios y el perfil del egresado en Biotecnología fueron discutidos con el Consejo Asesor Académico de la titulación, y con expertos del área biotecnológica tanto del campo científico como empresarial: investigadores del Consejo Superior de Investigaciones Científicas (CSIC), Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), centros privados de investigación, directores de I+D de empresas biotecnológicas, gestores de calidad, etc.

Tras estas reflexiones se definieron unas competencias específicas y genéricas del título, y a partir de éstas se diseñó un plan de estudios para ofrecer una formación en Biotecnología que incluyera un sólido conocimiento en ciencias básicas, ciencias de la vida, ingeniería y formación humanística; y una formación práctica de excelencia. En la UFV, el grado en Biotecnología se imparte junto con un título propio de Experto en Metodología en Investigación Biotecnológica, que forma al alumno en el uso y aplicación de las tecnologías más novedosas en el ámbito de la investigación y que mejora el nivel de inglés científico del alumno.

Dado el carácter investigador-experimental de esta titulación es muy importante que los alumnos adquieran una formación en investigación durante el grado. El objeto de este artículo es presentar el diseño del itinerario de formación práctica en investigación, que comienza en el primer curso del grado y se extiende hasta el último curso, abarca tanto el grado como el título propio, y permite al estudiante adquirir una formación práctica de excelencia, indispensable para el ejercicio de su profesión.

2. Metodología

El itinerario para una formación en investigación que hemos diseñado en el Grado en Biotecnología de la UFV comprende asignaturas de distinta naturaleza. La mayoría de las asignaturas son eminentemente prácticas y se realizan en los laboratorios de la universidad o como estancias en laboratorios externos (*Prácticas en Instituciones*), pero también hay asignaturas más teóricas donde se estudian las bases para desarrollar una correcta investigación (estudio del método científico, lectura y escritura de *papers*, etc.). Las asignaturas del itinerario formativo en investigación se imparten en todos los cursos del grado, empezando en el primer curso, y son impartidas tanto en castellano como en inglés. En la siguiente figura se puede observar cómo se distribuyen estas asignaturas en los diferentes cursos y semestres del grado y del título propio (Figura 1).

Figura 1

Itinerario formativo en Investigación del Grado en Biotecnología de la UFV

Curso	*1º*		*2º*		*3º*		*4º*	
Semestre	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Grado en Biotecnología	Clases prácticas asignaturas	Integrated Laboratory I	Clases prácticas asignaturas	Integrated Laboratory II	Clases prácticas asignaturas	Integrated Laboratory III		Prácticas en Instituciones
Título Propio	Introducción al Método Científico		Scientific and Technical English	Tecnologías de Apoyo a la Investigación		Journal Club and Scientific Writing	Reserch Project	

Clases prácticas

El primer contacto de los alumnos con el laboratorio se produce con la realización de las prácticas de las asignaturas. Prácticamente la totalidad de asignaturas del grado tienen asociados unos créditos prácticos en los que el alumno trabaja en el laboratorio. Durante la realización de estas prácticas el alumno aprende las técnicas básicas utilizadas en los laboratorios

de investigación relacionados con el área de la asignatura, y afianza los conocimientos teóricos adquiridos en el aula.

Estas prácticas se realizan de la manera tradicional, al alumno se le proporciona el manual de laboratorio y realiza la práctica de manera dirigida, pero para sacar el máximo partido los alumnos trabajan en grupos pequeños, en algunas prácticas se utiliza la gamificación, y se promueve la lectura de artículos científicos relacionados con la práctica y la discusión de resultados. Tras su estancia en estos laboratorios los alumnos aprenderán todas las técnicas esenciales utilizadas en Biotecnología, así como a registrar adecuadamente los experimentos en sus cuadernos de laboratorio, y los conceptos necesarios de prevención de riesgos laborales y buenas prácticas en el laboratorio.

Asignaturas teóricas

De forma paralela a las asignaturas prácticas, los alumnos cursan asignaturas teóricas que proporcionan conocimientos indispensables para el trabajo en investigación.

Introducción al Método Científico

El objetivo de esta asignatura que se imparte en el primer cuatrimestre del grado, dentro del título propio, es ofrecer al alumno los fundamentos y las herramientas metodológicas necesarias para desarrollar investigación en Biotecnología.

En la investigación científica o tecnológica, hay varias formas de abordar un problema, pero no todas son igualmente efectivas, siendo necesario la utilización de un método que permita obtener resultados eficientes en todos los casos. El método científico es el método utilizado en investigación experimental para la validación de un modelo. La mayoría de los alumnos que estudian carreras de ciencias no reciben clases específicas sobre el tema ni son instruidos convenientemente para aplicar el método científico de forma eficiente, con lo cual su productividad puede disminuir, al no conocer el método del área en que están trabajando.

Scientific and Technical English

El objetivo de la asignatura *Scientific and Technical English* es proporcionar al alumno los conocimientos necesarios del inglés que le permitan utilizar este idioma como herramienta profesional en el área de la Biotecnología. Se pretende que tras cursar esta asignatura el estudiante mejore las habilidades de investigación, al mejorar su comunicación de manera efectiva en inglés dentro del entorno profesional. El alumno aprenderá gramática, sintaxis, lectura, expresión oral y escrita y el uso del inglés en diversas actividades y formas de comunicación moderna (internet, etc.) mediante el uso de material escrito y audiovisual donde el idioma.

Tecnologías de Apoyo a la Investigación

Con esta asignatura se pretende proporcionar al alumno una visión cercana de algunas de las tecnologías de apoyo a la investigación disponibles hoy en día en los Centros de Investigación. Tecnologías como la secuenciación Sanger automática de ácidos nucleicos, las nuevas tecnologías de secuenciación masiva, la PCR en tiempo real, los microarrays, citometría de flujo, HPLC...Todas estas técnicas se realizan hoy en día en laboratorios o servicios de apoyo a la investigación dotados de la infraestructura adecuada para ofrecer al investigador

plataformas modernas de alta productividad en las que desarrollar parte de sus proyectos de investigación.

Journal Club and Scientific Writing

El objetivo de esta asignatura que se imparte en el sexto semestre de la carrera es proporcionar al alumno las herramientas para desarrollar habilidades de lectura y escritura de artículos científicos. La lectura de textos científicos es una actividad habitual en el desarrollo de la investigación. Es más, la investigación científica solo está completa tras la publicación de los resultados obtenidos en un artículo científico. Las publicaciones son un mecanismo a través del cual el investigador presenta sus resultados a la sociedad y demuestra sus capacidades de investigación. Por ello, es muy importante que el alumno adquiera habilidades relacionadas con la comprensión de la lectura y manejo de artículos científicos, así como la redacción de los mismos, para realizar su investigación de manera óptima.

Integrated Laboratories

Las asignaturas llamadas *Integrated Laboratories* son asignaturas semestrales, de 6 créditos, que se imparten en el primer, tercero, y quinto semestre del Grado en Biotecnología. En estas asignaturas se realizan prácticas más complejas que las realizadas en la parte práctica de las asignaturas, ya que integran en un mismo proyecto conocimientos adquiridos en varias asignaturas del curso. Los experimentos realizados no pertenecen a una asignatura en concreto, sino que para plantearlos como experimentos reales, están relacionados con diferentes asignaturas del curso siempre siguiendo un hilo conductor que englobe a todos los experimentos. *Integrated Laboratories* se imparten en inglés tipo EMI (enseñanza por medio del inglés), por ello y para el buen aprovechamiento de estas asignaturas, entre los criterios de admisión del alumnado al Grado en Biotecnología está la posesión de un nivel mínimo de B2 en idioma inglés, y los profesores que las imparten deben tener acreditado un nivel C1.

Las asignaturas *Integrated laboratories* pertenecen al módulo Métodos Experimentales en Biotecnología, que tiene como objetivo formar al alumno sólidamente en el trabajo de laboratorio y consolidar la formación teórica de grado, proporcionando no solo las habilidades básicas de laboratorio sino también el desarrollo otras cualidades personales, como el pensamiento crítico, la precisión y trabajo en equipo, que son esenciales en la práctica de la investigación.

La metodología utilizada es común para *Integrated laboratories* en todos los cursos, adaptando los contenidos al semestre en el que se encuentran, y constarían de los siguientes apartados:

Preparación de sesiones prácticas

Antes de las sesiones prácticas, los estudiantes reciben un manual de laboratorio donde se detalla, para cada experimento, una introducción teórica, objetivos, materiales y procedimientos experimentales. A los alumnos también se les proporciona el acceso al aula virtual de la asignatura, que funciona como plataforma de apoyo a las sesiones de clase, donde pueden encontrar material adicional y el apoyo necesario para su trabajo autónomo. Además, facilita el contacto permanente entre el alumno y el profesor por medio de tutoriales electrónicos y foros de discusión.

Sesiones prácticas

Las sesiones prácticas tienen lugar en los laboratorios de la Universidad Francisco de Vitoria, y en ella los alumnos realizan experimentos en el laboratorio aplicando técnicas y conocimientos previamente adquiridos en las asignaturas teóricas del curso. Durante y después de la finalización de las sesiones prácticas, se pide a los estudiantes que describan y analicen los resultados obtenidos y que saquen conclusiones significativas de ellos, información que deben entregar escrita en el cuaderno de laboratorio.

Seminarios de laboratorio

En estos seminarios los estudiantes exponen los resultados obtenidos en público, y posteriormente se discuten y comparan los resultados obtenidos por los diferentes grupos en las sesiones prácticas de laboratorio.

Tutorías

A petición del alumno y en el horario establecido para este fin, el profesor establece tutorías para contestar preguntas y resolver los problemas que puedan surgir durante el curso, con el fin de guiar al estudiante a lo largo del proceso de aprendizaje.

Para la evaluación de las asignaturas de *Integrated Laboratories* se califica mediante rúbricas el desempeño del alumno en el laboratorio y el cuaderno de laboratorio. También se realiza un examen teórico donde se le pregunta sobre las bases de los experimentos, y un examen práctico donde tiene que realizar individualmente uno de los experimentos realizados en la asignatura.

Research Project

Esta asignatura se imparte durante el séptimo semestre del Grado en Biotecnología y forma parte del título propio de Experto en Metodología en Investigación Biotecnológica. El Res*earch Project se* imparte en idioma inglés tipo EMI y consta de cinco créditos.

El objetivo del *Research Project* es que el alumno adquiera independencia y capacidad para diseñar, realizar y analizar experimentos por sí mismo. En las prácticas que el alumno ha cursado anteriormente los experimentos eran individuales relacionados con una asignatura (parte práctica de las asignaturas) o formaban parte de un proyecto que englobaba a varias asignaturas (*Integrated Laboratories*), pero en ambos casos eran prácticas dirigidas por un profesor en las que al alumno se le proporcionaban los manuales de laboratorio con los experimentos a realizar. En esta asignatura, el alumno trabaja de forma individual y autónoma, y no se le entrega manual de laboratorio. El alumno, a partir de unos objetivos propuestos por el profesor debe desarrollar estrategias, buscar protocolos y ejecutar los experimentos necesarios para obtener los resultados correspondientes a la hipótesis propuesta por el profesor.

La asignatura consta de las siguientes partes:

Diseño de estrategia experimental

En esta primera parte de la asignatura los profesores plantearán a los alumnos sobre los objetivos a alcanzar al final de la práctica (por ejemplo, *Optimization of the adhP gene over-expression*), y los materiales que disponen para ello (los diferentes plásmidos, células, bacterias

y material inventariable que vayan a utilizar). Partiendo de los datos proporcionados el estudiante debe diseñar una estrategia experimental dirigida a lograr el objetivo propuesto y escribir una memoria del proyecto de investigación. Este diseño experimental está diseñado de manera que el alumno lo pueda realizar utilizando técnicas ya utilizadas en las prácticas dirigidas.

Tutorías

El proceso de diseño experimental se realiza bajo la supervisión de los profesores en tutorías colectivas e individuales. Durante la realización de la primera fase del *Research Project* se realizarán varias tutorías, en ellas los alumnos irán presentando los avances realizados en la memoria del proyecto de investigación, para que sean evaluados y guiados por el profesor en el desarrollo de su trabajo.

Sesiones prácticas

Una vez que memoria del proyecto de investigación ha sido evaluada y aprobada por los profesores, el estudiante puede comenzar las sesiones prácticas de laboratorio. En estas sesiones el alumno trabaja de forma completamente independiente y autónoma para realizar los experimentos que ha descrito en su memoria. El alumno debe organizar sus horarios, el material necesario, los tiempos y el orden de sus experimentos con total libertad, aunque en el laboratorio siempre habrá personal, que no dirigirá el trabajo del alumno, pero supervisará que este trabajo se realice en condiciones seguras para él y sus compañeros.

Realización del informe final

Al finalizar el trabajo de laboratorio el alumno entregará un informe final en el que incluye resultados, discusión y conclusiones del trabajo experimental.

La evaluación del *Research Project* se realiza teniendo en cuenta la elaboración de la memoria de investigación, el informe final y el trabajo y actitud que el alumno presenta durante las sesiones prácticas.

Prácticas en Instituciones

La asignatura de *Prácticas en Institucione*s juega un papel fundamental en la formación de los estudiantes del Grado en Biotecnología como el punto en el que confluyen los conocimientos adquiridos y las competencias trabajadas durante los siete primeros semestres del programa. Esta materia obliga a todos los estudiantes a realizar una estancia mínima de tres meses en instituciones de investigación o empresas con las que existe un acuerdo institucional.

Las instituciones donde el alumno realiza las prácticas y con las que la universidad tiene acuerdos pueden ser centros públicos o privados de investigación, centros dedicados a la gestión en Biotecnología, y estar en España (CNIO, CSIC, Pfizer, PharmaMar, Sylentis entre otros) o en el extranjero (Imperial College, Memorial Sloan Kettering Cancer Center, Harvard Medical School, The Johns Hopkins Hospital, The Scripps Research institute entre otros). Los centros que reciben a los alumnos para realizar las *Prácticas en Instituciones* son punteros en sus áreas y en ellos el trabajo es exigente, por tanto, es importante que cuando los alumnos accedan a estas prácticas hayan recibido una completa formación en investigación que les permita aprovechar su estancia en estos laboratorios.

Durante estas prácticas el alumno se incorporará a trabajar en un proyecto de investigación o desarrollo ya en curso y deberá integrarse en el equipo realizando los experimentos y/o diseñando el desarrollo de las aplicaciones propuestas de forma independiente. El alumno deberá adaptarse a la casuística particular de la institución de acogida en cuanto a idioma, tema de trabajo, horario y planteamiento de desarrollo de la estancia. El alumno participará de las actividades del grupo de prácticas como seminarios, discusión de publicaciones científicas, reuniones de planificación, etc., según lo solicite su tutor de prácticas en cada institución. Al finalizar el periodo de prácticas, el alumno deberá presentar un *abstract* y un poster científico, en los que deberá recoger los objetivos del proyecto, los métodos utilizados para la obtención de resultados con la justificación pertinente, la interpretación los mismos con rigor científico y las conclusiones de su trabajo.

La evaluación de la asignatura recaerá tanto en el tutor de la institución de acogida, que valorará el trabajo realizado por el alumno durante su estancia en la institución, y en el coordinador de la asignatura, que calificará el *abstract* y el póster presentados por el alumno al finalizar las prácticas.

3. Resultados

La valoración de la formación práctica adquirida con este itinerario formativo se ha obtenido a través de las encuestas de satisfacción realizadas a los alumnos y a los egresados a través del Departamento de Calidad y Evaluación Institución de la universidad. También se ha utilizado la información obtenida de las encuestas realizadas a los tutores de instituciones receptoras de alumnos en las prácticas externas (*Prácticas en Instituciones*).

Los resultados de las encuestas de satisfacción de los alumnos con la asignatura de *Prácticas en Instituciones* muestran una alta satisfacción con las prácticas, nota media de 5,13, dándole un valor de 5,2 a las competencias que ha adquirido para el ejercicio profesional, y un valor de 5,0 al aumento de posibilidades para introducirse en el mundo laboral que le han proporcionado las prácticas (tabla 1).

Tabla 1

Informe de evaluación de la satisfacción del alumno con las prácticas externas

Cuestiones	2015-2016			2016-2017			2017-2018		
	Media	Moda	D.T.	Media	Moda	D.T.	Media	Moda	D.T.
9. He adquirido una serie de competencias necesarias para el ejercicio profesional.	5,30	6	1,03	5,30	6	1,06	5,00	5	1,24
10. Las prácticas han aumentado las posibilidades de introducirme en el mundo laboral.	4,81	6	1,52	5,22	6	1,64	4,83	6	1,47
11. Desde una consideración general, evalúa tu grado de satisfacción con las prácticas.	5,22	6	1,05	5,10	6	1,20	5,06	6	1,30

En la tabla se muestran únicamente los ítems de la encuesta relacionados con el itinerario práctico en investigación. Para la valoración de cada una de los ítems se utiliza la escala de Likert, del 1 al 6, siendo el 1 la expresión de la mínima satisfacción y el 6 la máxima.

Los datos de los ítems relacionados con la formación recibida en las encuestas realizadas a los egresados también fueron positivos. Estos datos se encuentran en la encuesta dentro del bloque de "proyección profesional", destacando los ítems "la formación técnica-práctica es útil para mi futuro" con un valor medio de 5,5; y "personalmente considero que la formación recibida es valiosa en su globalidad" con un valor medio de 5,23. Respecto los resultados de aprendizaje adquiridos, se pueden encontrar en el bloque sobre "desarrollo personal y profesional". Los más valorados positivamente son la capacidad de "aprendizaje autónomo" con un 4,89; la "capacidad de análisis" con un 5,00; la "capacidad de síntesis" con un 4,44; el "espíritu crítico" con un 5,00; el "trabajo en equipo" con un 4,56; y la "resolución de problemas" con un 5,13 (tabla 2).

Tabla 2

Informe de evaluación de la satisfacción de los egresados con la formación recibida

Cuestiones		2013-2014	2014-2015	2015-2016
		Media	Media	Media
Bloque D: Proyección Profesional	D2. La formación técnica-práctica recibida es útil para mi futuro.	5,40	5,42	5,63
	D4. Personalmente considero que la formación recibida es valiosa en su globalidad.	5,30	5,27	5,13
Bloque E: Desarrollo Personal y Profesional	E1. Aprendizaje autónomo (Conocer y Comprender).	4,75	4,75	4,75
	E2. Capacidad de análisis (Preguntarse los porqué).	4,70	4,70	4,70
	E3. Capacidad de síntesis (Buscar el sentido).	4,75	4,75	4,75
	E4. Espíritu Crítico (Juzgar con criterio).	4,90	4,90	4,90
	E9. Trabajo en equipo.	4,45	4,45	4,45
	E13. Resolución de problemas	4,85	4,85	4,85

En la tabla se muestran únicamente los ítems de la encuesta relacionados con el itinerario práctico en investigación. Para la valoración de cada uno de los ítems se utiliza la escala de Likert, del 1 al 6, siendo el 1 la expresión de la mínima satisfacción y el 6 la máxima.

Las encuestas realizadas a los tutores de instituciones receptoras, arrojan unos resultados altamente positivos, con una valoración muy buena de la actividad llevada a cabo por los estudiantes en los centros de acogida. Los tutores de las instituciones resaltan la excelente formación de nuestros alumnos, su inquietud intelectual, entusiasmo, capacidad para resolver problemas, y sus habilidades para trabajar en grupo y para comunicarse de forma oral y escrita. El excelente desempeño de nuestros alumnos viene también demostrado por el hecho de que algunos de ellos publican en revistas de alto índice de impacto los resultados del tra-

bajo realizado en durante las *Prácticas en Instituciones*. A continuación se muestran algunos comentarios:

> "The student is clearly the best student I have ever trained in my laboratory. He was from the first week very enthusiastic about both his own project and other projects in the team. Furthermore, he immediately learned and became skilled and independent in performing all laboratory techniques that were relevant for the work." Queen Mary University of London (QMUL), London, UK
>
> "She is highly imaginative, hardworking and cooperative researcher. She demonstrated commitment, organization and eagerness, all of which complement her innate intellectual and analytical abilities. Of all the students that have been working with me, I would rank her among the very top. That is why I decided to include her as an author of the manuscript we are preparing right now that we plan to submit to Nature in the near future." Harvard medical School, USA
>
> "She is one of the best students I have had, if not the best. She is an exceptional talent and poised to shine." Yale University, USA
>
> "La alumna vino con una preparación muy alta en el área biotecnológica lo cual le permitió aprender relativamente rápido las técnicas de cultivo y diferenciación de las células madre. Estoy muy satisfecha con los resultados que ha obtenido durante su estancia en el laboratorio del New York Stem Cell Foundation." New York Stem Cell Foundation, USA
>
> "Además de su gran interés por el trabajo de laboratorio ha demostrado una gran preparación técnica en todos los aspectos relacionados con el trabajo con levaduras, biología molecular, trabajo con proteínas, etc." Centro de Biología Molecular Severo Ochoa, Madrid, España

Dado que los tutores externos serán o tienen un perfil muy similar a sus futuros empleadores, esta información es muy relevante a la hora de valorar si los estudiantes han adquirido las competencias del grado.

4. Conclusiones

En el itinerario diseñado para la formación en investigación de los alumnos del Grado en Biotecnología y título propio de Experto en Metodología en Investigación Biotecnológica la Universidad Francisco de Vitoria se combinan diferentes tipos de enseñanza que han sido ampliamente avalados en la literatura, como Enquiry-based learning (EBL) en el *Research Project* (Adams, 2015), laboratorios modulares, en las asignaturas *Integrated Laboratories* (Caprette *et al.*, 2005), o el estudio de habilidades de comunicación científica (Cleveland, 217) entre otros. Tal como se puede observar por los resultados obtenidos este itinerario está cumpliendo los objetivos propuestos de proporcionar a los alumnos una formación práctica de excelencia.

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Contribución del trabajo de campo a la expresión del modelo en una secuencia indagativa sobre el modelo geológico con profesorado de primaria en formación

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Resumen

La enseñanza de modelos científicos es fundamental en la enseñanza científica actual. La modelización es el proceso para construirlos y utilizarlos (Justi y Gilbert, 2002) y es una de las prácticas científicas (con la argumentación e indagación) que la comunidad experta señala que hay que incorporar a las clases. Comprende varias fases, incluyendo la expresión del modelo, en la que se ha constatado que el alumnado tiene dificultades. Este estudio forma parte de un trabajo más amplio que pretende diseñar y evaluar estrategias que ayuden al alumnado a hacerles frente.

Se ha diseñado una secuencia de actividades de tipo indagativo para que los y las estudiantes construyan el modelo de cambio geológico (Bach y Márquez, 2017) en torno al sistema hidrogeológico de un valle kárstico local. Se ha realizado una salida de campo al valle, con el objetivo de reducir la distancia entre el concepto teórico y su representación en la realidad (Pedrinaci, 2012).

Tras la secuencia, 32 estudiantes de 4º del Grado de Educación Primaria escribieron su opinión acerca de la contribución de la salida al aprendizaje. Se ha analizado si incluían una aportación propia, clasificándose en aspectos generales del aprendizaje o aspectos relacionados con las prácticas científicas. Se ha analizado específicamente la contribución a la expresión del modelo.

Las 32 personas indican que la salida ha contribuido positivamente a su aprendizaje y han hecho aportaciones propias, el 84% hace referencias a aspectos relacionados con las prácticas científicas, destacando la modelización. En cuanto a la contribución de la salida a la expresión del modelo, un 25% lo hace de forma indirecta, y un 56.3% lo hace refiriéndose explícitamente a la expresión del modelo.

Próximamente, se procederá al análisis de los trabajos del alumnado para contrastar los resultados con los resultados de su percepción, pero parece que realizar salidas de campo puede ser una estrategia que ayude al alumnado en la expresión del modelo de cambio geológico y en la modelización.

Abstract

Teaching scientific models is essential in current science education. Modelling is the process of constructing and using them (Justi y Gilbert, 2002) and it is one of the scientific practices (also including argumentation and inquiry) that the expert community promotes to be included in science classrooms. It comprises several stages, including the expression of the model in which it has been shown that students have difficulties. This study is part of a wider project which pretends to design and evaluate strategies to help students overcome them.

It has been designed an inquiry based teaching sequence about the hydrogeological system of a local karst valley, whose objective is the construction of the geological change model (Bach y Márquez, 2017) by the students. Field work in the valley has been performed to reduce the distance between the theoretical concept and its representation in reality (Pedrinaci, 2012).

After taking part in the sequence, 32 4th grade students wrote their opinion about the contribution of the fieldwork to their learning. It has been analysed whether their writings included personal reflections, classifying them into general topics of learning or topics related to scientific practices. It has been specifically analysed how they referred to the contribution of the field trip to the expression of the model.

The 32 students say that the fieldwork has positively contributed to their learning and have made personal reflections, 84% of them related to scientific practices, specially modelling. Regarding to the contribution to the expression of the model, 25% addresses it in an indirect way, and 56.3% refers explicitly to the expression of the model.

The team will analyse different productions made by students to contrast those results with the perceptions of their authors, but it seems that fieldwork can be a useful strategy to help students in the expression of the model and the modelling process.

1. Introducción

Al igual que ocurre con la enseñanza de otras disciplinas científicas, uno de los grandes déficits de la enseñanza de la geología en la educación básica es que se encuentra anclada en la enseñanza de una serie de conceptos inconexos (Bach y Marquez, 2017), descontextualizados y generalistas (Compiani, 2011). Varios autores y organismos han señalado este hecho y han publicado manifiestos como el documento "Alfabetización en ciencias de la Tierra" (Pedrinaci *et al.*, 2012), en el que se expone que una persona "alfabetizada" en ciencias de la Tierra debe comprender el funcionamiento del planeta como un sistema, debe tener la correcta visión temporal de los sucesos que han modificado la Tierra, debe entender las relaciones entre Tierra y sociedad (peligros naturales, por ejemplo), y debe saber recoger información sobre procesos geológicos y emplear los principios y procedimientos básicos de esta ciencia.

Esta propuesta curricular para la enseñanza de la geología va en sintonía con las nuevas perspectivas en enseñanza de las ciencias, basadas en el desarrollo de la competencia científica (OECD, 2016), que inciden en la necesidad de integrar el contenido científico con las prácticas propias de la ciencia en el diseño de las secuencias educativas (Jiménez-Aleixandre y Crujeiras, 2017; NRC, 2012). Esto es, se busca reducir el contenido superfluo del currículo e incluir las prácticas científicas en su lugar.

La modelización constituye una de estas prácticas científicas, y se basa en la construcción y utilización de modelos (Justi y Gilbert, 2002) para explicar y predecir fenómenos científicos (Schwarz *et al.*, 2009). Comprende varias fases, incluyendo la expresión del modelo, en la que se ha constatado que el alumnado tiene dificultades. Se han publicado varios trabajos que proponen y analizan secuencias de modelización en la enseñanza de la geología (Blanco, 2015; Marquez y Bach, 2007), algunas incluyendo salidas de campo (Balliet, Riggs y Maltese, 2015; Márquez y Artés, 2016).

Existe un amplio consenso sobre los beneficios que las salidas de campo aportan para la enseñanza-aprendizaje de las ciencias (Aguilera, 2018; Pedrinaci, 2012) y de la geología en particular (Fernández-Ferrer y González-García, 2017; Pedrinaci, Sequeiros y García de la Torre, 1994). Según Pedrinaci (2012), las salidas de campo ayudan al desarrollo de la competencia científica al reducir la distancia de abstracción entre un concepto teórico y su representación en la realidad, y al permitir el planteamiento de problemas abiertos, con varias soluciones posibles, que requieran la interrelación de los conocimientos que se poseen. A pesar de esto, la literatura científica no ha incidido en los beneficios de las salidas de campo para el desarrollo de las prácticas científicas.

El objetivo de este trabajo es analizar la aportación del trabajo de campo al desarrollo de prácticas científicas durante una secuencia didáctica, según la propia percepción del estudiantado.

2. Marco teórico

2.1. Prácticas científicas

Las prácticas científicas (NRC, 2012; Osborne, 2014) se pueden agrupar en tres (Jiménez-Aleixandre y Crujeiras, 2017), ya que se relacionan con el diseño y puesta en marcha de investigaciones (Indagación), con el uso de pruebas y construcción de argumentos (Argumentación), y con la expresión, revisión y evaluación de modelos (Modelización).

La práctica de indagación es un proceso para descubrir nuevas relaciones causales (Pedaste *et al.*, 2015). Esta se desarrolla en diferentes fases, cuyo orden depende del contexto (Pedaste *et al.*, 2015), y que implican varias operaciones (NRC, 2012; Pedaste *et al.*, 2015), relacionadas con la identificación y formulación de preguntas que guíen la investigación, la formulación de hipótesis y predicciones, la planificación de la investigación, y la recogida y análisis de datos.

Por argumentación se conoce "esa capacidad de relacionar explicaciones y pruebas, o en otras palabras, de evaluar el conocimiento en base a las pruebas disponibles" (Jiménez-Aleixandre, 2010, p.11). Las operaciones que comporta esta práctica tienen que ver, por tanto, con la interpretación y uso de pruebas, con la formulación de conclusiones a partir de las mismas, con la elaboración de justificaciones, entendidas como elementos que conectan los datos con las conclusiones, y con la elaboración de refutaciones a los argumentos contrarios (Bargiela, Puig y Blanco, 2018; Jiménez-Aleixandre, 2010; NRC, 2012; Osborne *et al.*, 2016).

Los modelos científicos se entienden como representaciones abstractas que, simplificando la realidad y centrándose en ciertas características clave, tratan de explicar y predecir fenómenos científicos (Schwarz *et al.*, 2009). Al proceso de construcción, empleo, evaluación y revisión de los modelos se le denomina modelización (Schwarz *et al.*, 2009). Durante una secuencia de modelización, el alumnado realiza una serie de operaciones al construir y adaptar sus modelos, y estas se vienen englobando en cuatro fases (Gilbert y Justi, 2016): la creación de un proto-modelo mental, la expresión del proto-modelo (producción del artefacto, del modelo *per se*), el test (poner a prueba el modelo) y la evaluación del modelo.

En la fase de expresión de modelos, las diferentes respresentaciones pueden explicitar las representaciones mentales (Gómez y Gavidia, 2015). Los dibujos y maquetas ayudan a modelizar (Márquez, 2002) en tanto que tienen un gran potencial comunicativo, ya que permiten hacer una representación intencionada y simplificada de la realidad, y en ellos pueden recogerse aspectos de estructura, de funcionamiento del sistema o de relación con el entorno. Además, coordinar varias representaciones (verbal, visual, etc.) como andamiaje tiene beneficios en el aprendizaje del alumnado (Olander, Wickman, Tytler e Ingerman, 2017).

2.2. El trabajo de campo en geología

Varios trabajos señalan que realizar actividades fuera del aula contribuye a la comprensión de contenidos científicos y al aprendizaje significativo de estos (Aguilera, 2018). Sin embargo, Pedrinaci (2012) va más allá, y basándose en la perspectiva competencial, identifica tres variables que intervienen en el proceso de enseñanza-aprendizaje en las salidas de campo y que hacen de estas una actividad insustituible para el desarrollo de la competencia científica (en especial en las ciencias naturales):

En primer lugar, que el campo ayuda a reducir la distancia de abstracción entre un concepto teórico y su representación en la realidad, y en muchas ocasiones es la única manera de lograrlo (por ejemplo, en el caso de estructuras geológicas de tres dimensiones como fallas o pliegues). Por otro lado, la oportunidad que ofrece el campo de resolver problemas abiertos que requieran la interrelación de los conocimientos que se poseen (en vez de estudiarlos parcelados y fuera de su contexto, como ocurre con frecuencia en las programaciones escolares). La última variable tiene que ver con superar la inseguridad que tiene el alumnado cuando se enfrenta a problemas abiertos, producida por la costumbre a resolver problemas cerrados que sólo tienen una solución posible y que además se suele presentar como evidente.

Regresando a la geología, la necesidad de salir al campo es, si cabe, más evidente, ya que al ser esta una ciencia histórica e interpretativa (Frodeman, 1996), no se puede perder de vista el contexto espacial y temporal de los fenómenos estudiados (Compiani, 2011). Esto ocurre porque los fenómenos geológicos han sucedido en un contexto y un tiempo determinados del pasado, y son, por tanto, irrepetibles (Pedrinaci, 2003); la manera que tenemos de acercarnos a ellos es a través de la interpretación de las formas fijadas que han quedado en las rocas (Compiani y Gonçalves, 1996).

El campo se convierte, por tanto, en el sitio clave donde se recogen y analizan gran parte de los datos (la composición de la roca, su textura, el contenido fósil, su disposición espacial…), que están fragmentados espacialmente y temporalmente (Balliet, Riggs y Maltese, 2015), y para estructurarlos los geólogos y las geólogas se valen de representaciones visuales como mapas, cortes y columnas estratigráficas. Como puede deducirse, la visión espacial y las representaciones visuales adquieren un papel fundamental para organizar espacial y temporalmente la información recogida y para la reflexión por analogía en la construcción de los modelos geológicos (Balliet, Riggs y Maltese, 2015; Compiani y Gonçalves, 1996; Kali y Orion, 1996; Martínez-Peña y Gil-Quílez, 2014).

3. Metodología

3.1. Descripción del grupo y la secuencia

Se diseñó una secuencia didáctica de tipo indagativo, que se desarrolló durante el primer cuatrimestre del curso 2018/2019 con un grupo de 4.º curso del Grado de Educación Primaria de la Facultad de Educación de Bilbao (UPV/EHU), en la asignatura Tendencias Actuales en la Enseñanza de Ciencias. El grupo estaba formado por 41 estudiantes (33 chicas y 8 chicos), que trabajaron en 9 grupos de 3-4 personas. La secuencia didáctica tuvo una duración de 9 sesiones de 3h aproximadamente, y se basó en la reconstrucción del sistema hidrogeológico del valle de Orduña (Bizkaia), por lo que incluyó una salida de campo al entorno (se visitó la zona del nacimiento del río Nervión, desde el Monte Santiago y la zona de Delika).

El municipio de Orduña es un enclave de Bizkaia situado entre las provincias de Álava y Burgos, el valle tiene una morfología circular y está limitado por la Sierra Salvada por el sur. En las cotas más bajas afloran los yesos y arcillas de las facies *Keuper* del Triásico, y en las capas suprayacientes se encuentran las calizas del Cretácico Superior, dispuestas en estratos sub-horizontales y muy karstificadas, que forman los marcados relieves de la Sierra Salvada (Garrote, Muñoz, Arriola, Eguiguren y García, 1993). Esta sierra marca la divisoria de aguas entre el Cantábrico y el Mediterráneo y es en su cara norte donde nace el río Nervión, que pertenece a la unidad hidrológica de Ibaizabal y desemboca posteriormente en la ría de Bilbao (URA-GV, 2017).

La salida se realizó al inicio de la secuencia, aunque se dedicó una sesión previa para la realización de un pre-test y para la visualización de fotografías de la zona (se les pidió que formulasen hipótesis sobre la formación de las estructuras kársticas que se observaban, y que reflexionasen sobre qué tipo de pruebas buscarían en el campo). La salida tenía como objetivo que los grupos de estudiantes recogiesen datos para poder reconstruir un modelo que explicase el funcionamiento del sistema hidrogeológico de la zona, algo que se encauzó mediante una pregunta que fue formulada por primera vez en el campo: *¿Por qué el río Nervión tiene agua, aunque no llueva ni haya agua en la cascada?* Para responder a esta pregunta había que analizar, en primer lugar, el modelado kárstico de la sierra, y, posteriormente, conocer las características de porosidad y la permeabilidad de las rocas para poder así, modelizar el funcionamiento del acuífero kárstico.

En las posteriores sesiones, los grupos de estudiantes tuvieron que construir modelos para responder a esta cuestión, para lo cual se les aportó datos nuevos: se trabajó con mapas de la zona, se vieron muestras de las rocas observadas en el campo al microscopio, se realizaron experimentos de porosidad y permeabilidad, y se les aportó también información teórica (principios estratigráficos, diferencias entre meteorización física y química, formación de acuíferos…). Posteriormente los grupos elaboraron maquetas para responder a la cuestión, y la secuencia terminó con la presentación y evaluación de las maquetas y con un post-test.

3.2. Instrumentos de análisis

Tras la secuencia, 32 estudiantes escribieron en el post-test su opinión acerca de la contribución de la salida al aprendizaje. Se ha analizado si las respuestas incluían una aportación propia, clasificándose en aspectos generales del aprendizaje o aspectos relacionados con las prácticas científicas. Para considerar que se hacía referencia a una práctica científica determinada, se ha tenido en cuenta si se hacía referencia específica a las operaciones que comporta el desempeño de tal práctica, y que se han señalado en el marco teórico. Se ha analizado específicamente la contribución a la expresión del modelo.

4. Resultados

Las 32 personas indican que la salida ha contribuido positivamente a su aprendizaje y han hecho aportaciones propias.

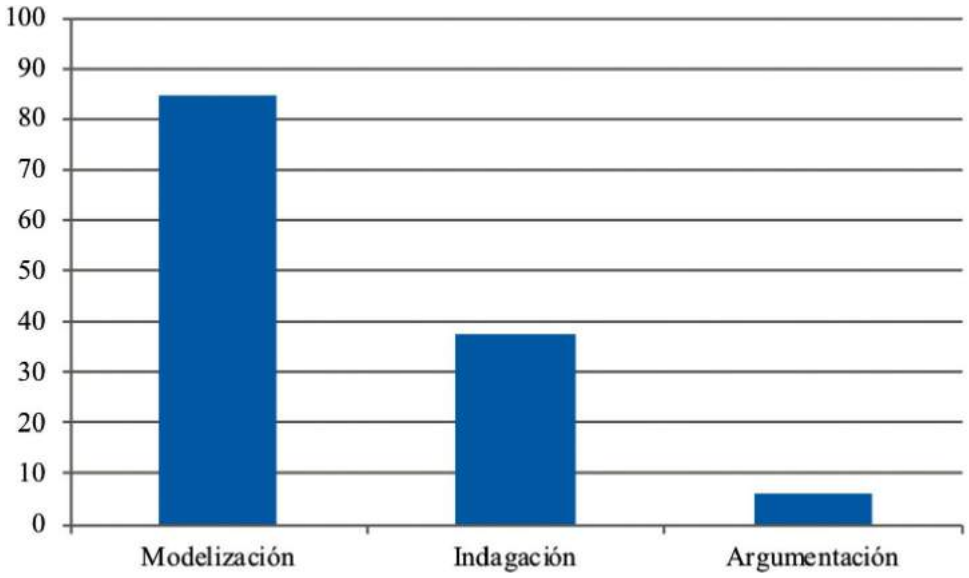
En cuanto a las aportaciones percibidas de la salida respecto al desarrollo de las prácticas científicas, únicamente el 15.6% de los y las estudiantes no hace referencia a aspectos relacionados con las prácticas científicas, el 46.9% describe aspectos relacionadas con una de ellas, el 31.3% a aspectos de dos, y el 6.3% a las tres. Tal y como se observa en la Figura 1, una mayoría de estudiantes (84,4%) menciona aspectos relacionados con la modelización.

Respecto a la práctica de indagación (37,5%), se mencionan sobre todo operaciones como la observación y la recogida de datos y con menor frecuencia el análisis de datos. Por ejemplo:

— Estudiante 1: "*Al trabajar como investigadores/as, empezamos a probar cosas observando y tocando*" (observar, recoger datos).
— Estudiante 7: "*La salida ayuda a analizar el recorrido del agua subterránea y me ha ayudado a darme cuenta de ello*" (analizar datos).

Figura 1

Porcentaje de estudiantes que considera que la salida de campo ha contribuido a su desempeño en cada una de las prácticas científicas



Como se observa, la argumentación ha sido la práctica menos mencionada (solo dos estudiantes lo han hecho; 6,3%). Concretamente se destaca la utilidad de la salida para usar e interpretar pruebas y para elaborar justificaciones:

— Estudiante 14: "*Creo que la salida te lleva a pensar, a pensar por qué las cosas son como son*" (elaborar justificaciones).
— Estudiante 32: "*Tratamos de buscar sentido a las preguntas y para eso utilizamos pruebas y el método científico*" (usar e interpretar pruebas).

En lo referente a la modelización, destacar, en primer lugar, que el alumnado ha hecho mención a operaciones relacionadas con la fase de creación del modelo mental:

— Estudiante 8: *Diría que la salida ha sido útil, porque gracias a ella he podido relacionar lo que hemos trabajado en el aula antes y después de la salida con un modelo real. Esto es, hemos visto cómo ocurren en la realidad, y eso ha provocado que tengamos un modelo en mente.*

Sin embargo, como se ha señalado, se ha analizado específicamente cómo se percibía la contribución a la expresión del modelo, ya que después de la salida realizaban una representación en forma de maqueta. En este caso, el 81.3% señaló aspectos relacionados con tal expresión, bien de forma indirecta (25%) como de forma explícita (56.3%). A continuación, se muestran varios ejemplos:

— Estudiante 6: "*Ver las cosas en la realidad*".
— Estudiante 31: "*Para hacer la maqueta*".
— Estudiante 21: "*Al hacer la maqueta traté de relacionarlo con lo visto en la realidad*".

5. Discusión de resultados y conclusión

Las respuestas dadas por los y las estudiantes a la pregunta de en qué manera creen que la salida de campo ha contribuido a su proceso de aprendizaje muestran que han considerado que el trabajo realizado en la salida ha contribuido de manera positiva al mismo. Esto está en línea con los estudios que destacan precisamente la aportación del trabajo de campo al aprendizaje de la geología (Balliet, Riggs y Maltese, 2015; Compiani y Gonçalves, 1996; Pedrinaci, 1994).

Los resultados muestran, además, que el alumnado hace referencia en su mayoría, a aspectos concretos, a operaciones relacionadas con las prácticas científicas. Este es un resultado de interés, ya que la contribución del trabajo de campo a las prácticas científicas ha sido poco investigado. Aunque se han mencionado operaciones de observación, recogida y análisis de datos (práctica de indagación), y también de uso e interpretación de pruebas (práctica de argumentación), ante todo han destacado las operaciones relacionadas con la modelización. Concretamente, el alumnado ha hecho referencia a las fases de creación y expresión del modelo; esta última constituye una de las claves del proceso y en otros estudios se ha visto que resulta dificultosa para el alumnado.

Una limitación de este trabajo es que se analizan percepciones de estudiantes. Próximamente, se procederá al análisis de los trabajos del alumnado para contrastar los resultados con los resultados de su percepción, pero parece que realizar salidas de campo puede ser una estrategia que ayude al alumnado en la expresión del modelo de cambio geológico y en la modelización.

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Aprender investigación investigando: aplicación de la metodología inductiva de Aprendizaje Basado en Investigación (ABI) en el proceso de enseñanza-aprendizaje de la asignatura de Investigación Socioeductiva de cuarto de Educación Social de la Universidad de Barcelona

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Abstract

Research-Based Learning (RBL) is an active, inductive teaching methodology based on students. Its aim is to use the phases of scientific research as a teaching-learning method. That is, by using the same phases as a research investigation, students can cover the skills of their academic curriculum. This offers a contextualised, meaningful learning system which encourages the acquisition of degree-specific skills, as well as the basic skills of the ministry and the transversal skills established by each field of study such as: oral and written communication, teamwork or critical thinking. Due to this, RBL is an appropriate methodology for higher education studies and, specifically, for the self-taught learning of scientific research skills that are given in subjects such as "Socio-educational research" from the Social Education degree at the University of Barcelona. In this fourth-year subject, a series of central blocks are designed to understand, design and apply research in the socio-educational field. During a semester, students work around these blocks which, at first, tend to be too abstract and far away from the professional practice of Social Education students. Therefore, making use of RBL, students are allowed to select a topic of interest for their profession. Next, the class groups are divided into specific problem areas and the students are allowed to manage their own learning process, helping to improve interest, performance and motivation enormously. The active work of the 52 students has allowed the acquisition of skills and knowledge in a remarkable way. These lessons have been measured and observed with various memory tests of both application and creation. It should be noted that significant differences can be seen in comparison with the students of a single evaluation (8) who have only followed an individual memory method. To conclude, it must be highlighted that there are moments of high workload and stress during the semester with this method but, despite this, the students show a high satisfaction with the process and with their learning, as well as with the utility of RBL in other subjects, especially for the Final Degree Project.

Resumen

El Aprendizaje Basado en Investigación (ABI) es una metodología docente inductiva, activa, centrada en el alumnado. Ésta tiene como objetivo usar las fases de la investigación científica como método de enseñanza-aprendizaje. Es decir, usando las mismas fases de una investigación, el alumnado puede llegar a cubrir las competencias de su currículo académico. Todo ello ofreciendo un aprendizaje contextualizado, significativos y que fomenta la adquisición de competencias específicas de su grado, así como las básicas del ministerio y las transversales establecidas para cada estudio como: comunicación oral y escrita, trabajo en equipo o pensamiento crítico. Por todo ello, es una metodología adecuada para los estudios de enseñanza superior y, concretamente, para el propio aprendizaje de las competencias de investigación científica que se dan en asignaturas como "Investigación socioeducativa" del grado en Edu-

cación Social de la Universidad de Barcelona. En esta asignatura de cuarto curso, se trabajan una serie de bloques centrales para entender, diseñar y aplicar una investigación en el ámbito socioeducativo. Durante un semestre se trabaja alrededor de estos bloques que para el alumnado de Educación Social suelen ser, en un inicio, demasiado abstractos y alejados de su práctica profesional. Por todo ello, hacer uso del ABI, ofreciendo seleccionar un tema de interés de su profesión, dividir los grupos de clase por áreas problemáticas concretas y dejarlos gestionar su propio proceso de aprendizaje, ayuda enormemente a mejorar el interés, el rendimiento y la motivación. El trabajo activo de los 52 alumnos y alumnas, ha permitido la adquisición de habilidades y conocimientos de una manera notable. Estos aprendizajes han sido medidos y observados con diversas pruebas memorísticas, de aplicación y de creación. Cabe destacar, que se pueden ver diferencias significativas en cuanto a la comparativa con el alumnado de evaluación única (8) que solo han seguido un método memorístico e individual. Para finalizar, destacar que hay momentos de alto trabajo y estrés durante el semestre con este método pero que, pese a ello, el alumnado muestra una alta satisfacción con el proceso y el aprendizaje, así como con la utilidad en otras asignaturas, especialmente para el Trabajo Final de Grado.

1. Introducción

El Centro para la Innovación en Aprendizaje y Conocimiento (CLIK) se encarga de dar soporte al profesorado de la Universidad Pompeu Fabra. En esta línea, el centro, asesora en temas de formación, nuevas metodologías o tecnologías educativas, entre otros aspectos. En esta línea, durante el curso 2017-2018, como técnica del ámbito de la innovación, creamos una guía de uso interno sobre Aprendizaje Basado en Investigación (ABI). De ahí derivó en el aprovechamiento de toda esa información para las clases que realizo, como profesora asociada, en el grado en Educación Social en la Facultad de Educación de la Universidad de Barcelona. Concretamente, la decisión fue aplicar el ABI en la asignatura "Investigación socioeducativa[1]", obligatoria del primer semestre de cuarto y con 6 créditos ECTS. Dicha asignatura suele tener un recibimiento frio por el estudiantado, ya que es un alumnado muy enfocado a la intervención social y la parte de investigación, al inicio, sienten que les queda muy alejada. Por ello, la metodología ABI se consideró altamente adecuada para la enseñanza de las competencias de dicha asignatura, ya que el alumnado aprende investigación investigando. Es decir, aprenden las competencias definidas para la asignatura a través de una metodología activa, participativa, reflexiva, centrada en el alumnado y sujeta a los parámetros característico de la propia investigación. En conclusión, permite motivar al estudiantado haciendo uso de una metodología *learning by doing* que potencia competencias de orden superior, no solo memorísticas, sino también de análisis y creación. Estos elementos son básicos para superar la asignatura, entendida no como un punto final, sino como itinerario/viaje de aprendizaje, que les ayuda enormemente a superar también el Trabajo Final de Grado, que han de presentar pocos meses después. En síntesis, con la metodología ABI se aprenden los conceptos y habilidades de la asignatura, pero también competencias generales y transversales del grado, y, todo ello, se extrapola a su futuro, inminentemente académico y, a medio plazo, profesional.

[1] Plan docente: http://www.ub.edu/grad/plae/AccesInformePDInfes?curs=2018&assig=360853&ens=TG1028&recurs=pladocent&n2=1&idioma=CAT

1.1. ¿Innovación docente disruptiva? cambios docentes de mejora o de transformación

Una educación superior de calidad debería tener como objetivo el hacer los procesos de enseñanza-aprendizaje más eficaces y eficientes para lograr mayor impacto en el aprendizaje y rendimiento académico de nuestro estudiantado. Aun así, como señalan Díez-Palomar y Flecha. (2010, p. 19) "La educación es uno de los ámbitos sociales a los que más les cuesta cambiar". Se dice que, si trajéramos a un personaje histórico, como, por ejemplo, a Sócrates o un maestro algo más actual que él en la historia, a la actualidad y lo lleváramos a un quirófano, nos sabría dónde está. En cambio, si lo lleváramos a una universidad, rápidamente detectaría el espacio y su función. El profesorado a un lado, el alumnado a otro, uno dando la lección, a través de un modelo de comunicación unidireccional, y los otros haciendo como que escuchan. En resumen, una docencia con grandes rasgos aún de la industrialización. Mientras la sociedad cambia enormemente a una velocidad de vértigo, la educación sigue en una burbuja sin integrar los nuevos avances. Un ejemplo claro, está en la sociedad de la información y el uso de la tecnología. El alumnado tiene acceso a casi todo lo que puede explicar el profesorado, por tanto, si la función de la educación solo es transmitir, algo que encuentran fuera, deja de tener sentido y empiezan los problemas de motivación o absentismo. Esto replantea el modelo desde la práctica, para mejorar la eficacia, así como para adaptarnos a los y las estudiantes *millenials*. Por ello, es necesario redefinir el objetivo de la educación, el rol profesorado y el uso de las metodologías. Necesitamos gestores de todo el contenido que hay, especialista filtrar/curar la información adecuada para luego reflexionar, analizar y aplicar ese conocimiento en las aulas. Solo así dotaremos de significado y valor los espacios formales.

En algunos casos, el profesorado motivado suele probar ocurrencias, pero estas sin evidencias ni antes ni después de su aplicación. Esto ocasiona que, generalmente, se fracasa en las innovaciones educativas al no tener rigurosidad científica. Por tanto, es necesario aplicar la investigación, no solo como metodología docente, sino también en las innovaciones en los procesos de enseñanza-aprendizaje de cara a diseñarlos, mejorarlos y transferirlos, pero, especialmente, para que sean disruptivas y provoquen cambios (Soria y Carrió, 2016). Como indican Díez-Palomar y Flecha (2010), es impensable que en ámbitos como la salud se prueben tratamientos sin haberlos testado. Para ello, siguiendo con los mismos autores es necesario un comportamiento intelectual por parte de los y las educadores.

En síntesis, los procesos de innovación educativa deben ser sistemáticos, planeados y disruptivos, además de partir de necesidades reales para la mejora de los procesos de enseñanza-aprendizaje (Salinas, 2008; De La Torre, 1997).

1.2. La metodología de Aprendizaje Basado en Investigación ABI: una innovación educativa en las aulas tradicionales

El Aprendizaje Basado en Investigación (ABI) es una metodología docente inductiva, activa, centrada en el alumnado. Ésta tiene como objetivo usar las fases de la investigación científica como método de enseñanza-aprendizaje. Es decir, usando las mismas fases de una investigación, el alumnado puede llegar a cubrir las competencias de su currículo académico (Wood y Smith, 2017). Además, se fomenta el aprendizaje entre iguales a través del trabajo en grupos, beneficiando a todos los estudiantes: "Las interacciones entre estudiantes con diferentes niveles de competencia benefician a los y las estudiantes con más nivel y a las y los de nivel más bajo, ya que en el propio proceso de ayudarse se dan muchos momentos para

reforzar lo que se sabe, identificar lagunas y errores de comprensión y enriquecer el conocimiento con puntos de vista alternativos" (Rogoff, 1993 en Díez-Palomar y Flecha, 2010, p. 21). En la misma línea, "En el aprendizaje basado en la investigación, los estudiantes tienen la posibilidad de relacionarse con la indagación por medio del método científico, para actuar con conocimientos, habilidades y actitudes" (Rivadeneira y Silva Bustillo, 2017:6). Así como, a su vez aprender, para poder ejercer con eficiencia y eficacia dichas actuaciones. Es decir, permite un aprendizaje memorístico, pero también de evaluación, análisis y creación. Como indican los mismos autores, el ABI además ofrece un aprendizaje significativo para los estudiantes ya que ofrece resolver problemas reales y actuales de su práctica profesional. Si fijamos la mirada en los principios básicos de las investigaciones en educación, fácilmente se pueden triangular con las competencias de los grados, en especial con aquellas básicas del ministerio o con las generales y transversales de cada estudio. Por ello, y como señalan Wood y Smith en su libro de 2017, es tan importante la alfabetización investigadora de los estudiantes universitarios. Esto no quiere que todos los estudiantes se dediquen luego a la investigación o que deban desarrollar investigaciones complejas. Se pueden hacer investigaciones a pequeña escala con ventajas en el aprendizaje de los estudiantes. Así mismo, el ABI o la investigación, nos permite contextos donde el conocimiento no está parcelado, sino que ofrece un enfoque interdisciplinar como señalan Pozuelos, Rodríguez Miranda y Travé (2009) donde el aprendizaje ya no se asimila de manera aséptica y repetitiva, sin esquemas fragmentarios dando contextos de aprendizaje de conocimientos plurales, diversos e integrados permitiendo una mayor comprensión del mundo real y de su futuro profesional. Por todo lo indicado, es una metodología muy completa para la educación superior.

Para finalizar, como señalan Wood y Smith (2018) esta metodología puede servir para cualquier disciplina, ya que la investigación educativa tiene naturaleza interdisiciplinar. Para ello, cabe ver las peculiaridades de cada disciplina, adaptarse y ser crítico con ellas.

2. Metodología

La metodología utilizada en esta experiencia ha sido una Investigación-Acción que permite comprender de forma global el proceso de enseñanza-aprendizaje y, a su vez, orientar hacia mejorar de calidad (Elliot, 1990). Esta se ha guiado por el objetivo de: mejorar el proceso de enseñanza-aprendizaje y la adquisición de competencias de orden superior en la asignatura de investigación socioeducativa del grado en educación social de la Universidad de Barcelona.

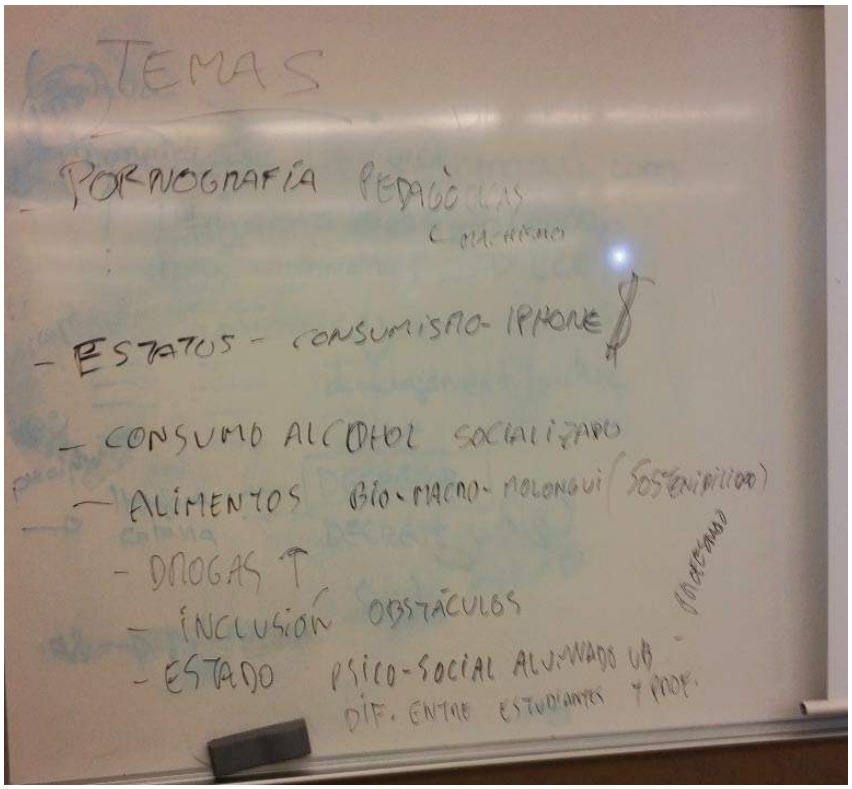
El total de participantes ha sido de 60, siendo 52 de ellos de evaluación continua y 8 de evaluación única, y los instrumentos de recogida de información han sido varios, pero en este artículo se presentan tres:

- Los exámenes (60n) constaban de dos partes diferenciadas, una primera parte memorística tipo test con 20 preguntas de múltiple y otra de aplicación de conceptos con 5 casos prácticos.
- El autoinforme (50n) constaba de un documento con pocas preguntas para reflexionar sobre el proceso de aprendizaje.
- Encuesta de valoración de la asignatura (21%) y el profesorado oficial de la universidad.

Por lo que respecta a las fases de dicha metodología, se han seguido las mismas que indican Wood y Smith (2018:125) que, a su vez, serían las mismas que en una investigación con

algún matiz. Los autores señalan el siguiente flujograma de un proyecto de investigación a pequeña escala: 1) identificar el problema o asunto de interés (*ver figura 1*), 2) desarrollar las preguntas para la investigación, 3) Buscar algo de la literatura de investigación en el área de interés, 4) revisar/alterar las preguntas de investigación a la luz de esas lecturas, 5) decidirse por la metodología de investigación y considerar la dimensión ética, 6) desarrollar herramientas de recogida de datos y considerar el tipo de análisis que se va a realizar. Prueba piloto cuando sea necesaria, 7) Captar, ordenar y analizar los datos, 8) Interpretar los datos y 9) comunicar los resultados de la investigación. Informe. Además, en este caso, es positivo añadir un apartado de reflexión sobre lo aprendido y un plan de mejorar para su futuro aprendizaje.

Figura 1
Fase de la lluvia de idea:
pizarra con las temáticas propuestas para el curso 2018-201



En muchas de las fases se les ofrecía una ficha a los estudiantes para concretar que debían decidir y justificar brevemente el motivo de la decisión (*ver figura 2).* A su vez, los últimos minutos de cada clase debían compartir con todo el grupo de clase sus avances, dudas y decisiones. Así mismo, se fueron combinando ejercicios inductivos con otros más deductivos, es decir, primero el alumnado intentaba resolver la tarea o reto y después la profesora ofrecía una cápsula docente sobre los elementos básicos de la tarea o reto para ir mejorando su conocimiento desde la experiencia, pero también desde el conocimiento. De esta forma, el alumnado encontraba más interesantes y significativas las explicaciones de la docente, al ver cómo podían mejorar lo que ya habían hecho (detectando así sus carencias y dándole sentido al conocimiento nuevo).

Figura 2
Grupos reducidos definiendo los objetivos de su investigación

3. Resultados

En la comparativa de los exámenes, como se observa en la *tabla 1*, con esta metodología el alumnado de continua obtiene casi un punto superior en cuanto a la parte memorística y casi medio punto en la parte de aplicación.

Tabla 1
Comparativa de notas del examen

Total 60	Media de la parte memorística (sobre 5)	Media de la Parte de casos aplicados (sobre 5)
Notas continua	3.5	3.3
Notas única	2.6	2.9

Por lo que respecta a los autoinformes, se destacan varias categorías por parte del alumnado. Siendo ellas, casi todas positivas, relacionadas con el valor a su profesión, y formación, y algunas negativas, siendo la más destacada la carga de trabajo con la metodología ABI (*ver tabla 2*).

Para finalizar, destacar que la encuesta de valoración se pasó finalizada la asignatura, la respuesta fue de un 21% del alumnado y la media de satisfacción de un 9,70 sobre 10.

Tabla 2
Tabla de categorías extraídas del análisis de los autoinformes

Relacionados con el valor de la investigación para su campo	valor en su profesión
	dificultad y complejidad para hacer una buena investigación
Relacionados con la carga de trabajo	volumen extra
Relacionadas con la necesidad de más formación de este ámbito	querer saber más de investigación para su futuro
Relacionados con la metodología	motivadora
Relacionados con las competencias	crítico/a con la información
	compromiso
	trabajo en equipo
	orden
	aprendizajes aplicado y no solo memorísticos
relacionados con la asignatura	asignatura teórica y densa que al final te acaba gustando

4. Conclusiones

Esta experiencia ha demostrado como el diseño de la innovación propuesta y la recogida de datos, es fundamental para poder valorar, mejorar y replicar la propuesta metodológica. Así mismo, se requerirá de más experiencias parecidas para ir creando un corpus de conocimiento alrededor del uso del ABI en educación superior.

Como metodología para la asignatura planteada, ha resultado cumplir el objetivo propuesto. Ya que se comprueban en los exámenes mejoras significativas. Prueba de ello es, como se observa en la tabla1, que la metodología ABI no solo ayuda a mejorar la aplicación de los conocimientos, sino también a fijarlos para luego usarlos. Por tanto, ofrece un aprendizaje de competencias sólidos, que, a su vez, como se ve en la tabla 2, el alumnado también percibe.

Finalmente, valorar la disrupción de esta innovación es algo complejo, ya que se requerirían de más evidencias. Por ahora, sin más grupos para triangular, se puede concluir que la aplicación de la metodología ABI en el curso 2018-2019 ha dado unos buenos resultados de aprendizaje, así como una alta satisfacción por parte del alumnado pese al nivel de exigencia y esfuerzo.

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The 'Student engagement' as the framework of the 'Scholarship of Teaching and Learning' in the Higher Education

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Abstract

This paper sets out the findings of a study of authors, research groups and topics involved in research into higher education over the last twenty-one years (1998-2018) and examines the topic of student engagement (SE). The goal of the study is to identify the protagonists (authors and research groups) in this area and ascertain which topics require further research with new contributions in the area of *Scholarship of Teaching and Learning* (SoTL).

Resumen

Este artículo realiza un estudio por autores, grupos de investigación y temáticas desarrolladas en el marco de la investigación sobre Educación Superior de los últimos veintiún años (1998-2018) y en el tópico *Student Engagement* (SE). El objetivo es identificar a los protagonistas (autores y grupos de investigación) en el desarrollo de esta área; así como identificar temáticas en las que se vislumbra la necesidad de ahondar con nuevas aportaciones desde el punto de vista de la investigación en docencia.

1. Introduction

La investigación en docencia se puede abordar tanto desde los enfoques centrados en las metodologías docentes; como desde los enfoques centrados en gestión institucional. Ambos enfoques se complementan y retroalimentan en la investigación centrada en el estudiante, y más concretamente en la manera en que desde ambos planos, se puede afrontar el reto de la participación, la motivación y la implicación del estudiante con su formación y con la institución que la provee. Este fenómeno es un movimiento internacional conocido como el "*Student Engagement*" (SE). Cada vez existe más consciencia desde la comunidad académica en la importancia que tiene el SE tanto en el éxito en los resultados de aprendizaje y formación integral del estudiante, como en las valoraciones de la calidad del servicio ofrecido por el centro de formación. No en vano se están desarrollando políticas educativas a nivel internacional y cada vez más globales para impulsar el SE a todos los niveles educativos, y también concretamente en la educación superior, foco del trabajo de revisión bibliométrica que exponemos en las siguientes secciones de este documento. Para utilizar una nomenclatura abreviada del término y que mantenga el carácter internacional que lo representa, utilizamos el acrónimo (SEHE) como abreviatura de la expresión "Student Engagement in the Higher Education".

El SEHE se ha convertido en un tópico de investigación con creciente interés en el marco del *Scholarship of Teaching and Learning* (SoTL) ya que son cada vez más numerosas las publicaciones que focalizan su objeto de estudio en la delimitación del concepto, así como en el conocimiento de las múltiples dimensiones que lo conforman. La revisión bibliométrica realizada ha permitido organizar y sistematizar el importante y creciente número de publicaciones existentes y, por tanto, mostrar una visión general del área de investigación, apoyando con ello al enriquecimiento del (SoTL).

2. Metodología

El primer paso de un análisis bibliométrico es el de seleccionar la base documental sobre la que se realizará la revisión. En este estudio se ha optado por utilizar la información bibliográfica de la *Clarivate Analytics' Web of Science* (WoS en adelante), ya que esta base documental únicamente recoge aquellas publicaciones respaldadas por los más altos indicadores de impacto, que es el criterio de calidad reconocido de forma general.

La búsqueda y selección de documentos se ha realizado el 9 de enero de 2019, con la intención de extraer las publicaciones existentes hasta el último año registrado en la WoS 2018.

La combinación de términos que han sido motor de búsqueda en la WoS es: [("*Universit**") OR ("*High** *education*") AND ("*Student Engagement*")], seleccionando los documentos que tienen esa combinación en el título, las palabras clave o en el resumen. Adicionalmente, se han filtrado los resultados de la búsqueda de acuerdo con los siguientes criterios:

— Únicamente se han seleccionado "*articles*" y "*reviews*" ya que son los tipos de documentos más relevantes que gozan de revisión por pares, previa a su aceptación de publicación.
— Únicamente se han seleccionado artículos de las siguientes categorías de la WoS: "*Education Educational Research*", "*Psychology Educational*", "*Education Scientific Disciplines*" ya que son las áreas más comúnmente utilizadas para clasificar el tópico de investigación.

A partir de esta búsqueda se han seleccionado 755 documentos. El primer artículo publicado en la WoS que cumple todos los requisitos de búsqueda data del año 1998, aunque en el área generalmente se reconoce que fue el estudio de Astin's (1984) el que marcó el origen de tópico.

Las referencias bibliográficas de la base documental se han analizado a diferentes niveles para proporcionar información confiable y en profundidad sobre los artículos, los autores.

3. Evolución de la producción científica

La evolución de las publicaciones en SEHE por año (figura 1) revela que nos encontramos ante un tópico de investigación relativamente reciente ya que, tal y como apuntábamos anteriormente, el primer artículo en el que formalmente aparece reflejado el término SE data del año 1998. Además, se pueden distinguir tres períodos diferentes etiquetados como: a) *etapa inicial* (T1) (1998-2008) en el que únicamente se publicaron 32 artículos, b) *etapa de desarrollo* (T2) (2009-2014) a la que corresponden 197 artículos y c) *etapa expansiva* (T3) (2015-2018) con 526 artículos publicados. Todos estos indicadores apuntan a que el tópico SEHE ha ido atrayendo creciente interés entre los investigadores, especialmente en los últimos cinco años.

Figura 1
Evolución por años de la investigación en el tópico SEHE

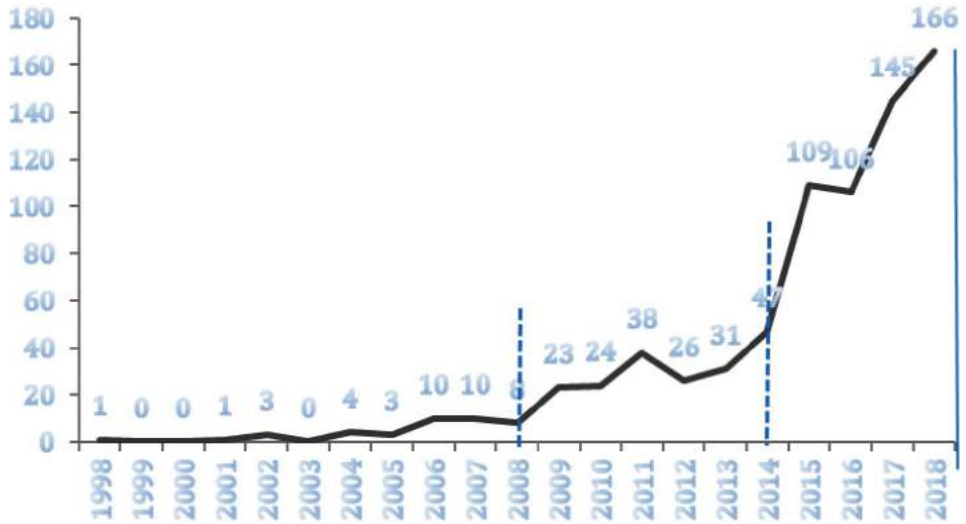


Tabla 1
Los autores más productivos y más citados en el tópico SEHE

R	Autores	TC	TP	TP1	TC1	TP2	TC2	TP3	TC3
1	Kuh, G. D.	1.038	13	10	789	3	249	0	0
2	Zepke, N.	139	11	0	0	5	100	6	39
3	Pike, G. R.	266	9	6	193	3	73	0	0
4	Kahu, E. R.	220	7	0	0	2	196	5	24
5	Junco, R.	876	4	0	0	4	876	0	0
6	Coates, H.	284	4	1	218	2	62	1	4
7	Porter, S. R.	241	4	3	156	1	85	0	0
8	Carini, R. M.	454	3	3	454	0	0	0	0
9	Dawson, S.	312	3	0	0	3	312	0	0
10	Macfadyen, L.	312	3	0	0	3	312	0	0
11	Heiberger, G.	452	2	0	0	2	452	0	0
12	Klein, S. P.	374	1	1	374	0	0	0	0
13	Loken, E.	362	1	0	0	1	362	0	0
14	Krause, K.-L.	218	1	1	218	0	0	0	0
15	Handley, K.	202	1	0	0	1	202	0	0
16	Millar, J.	202	1	0	0	1	202	0	0
17	O'Donovan, B.	202	1	0	0	1	202	0	0
18	Price, M.	202	1	0	0	1	202	0	0

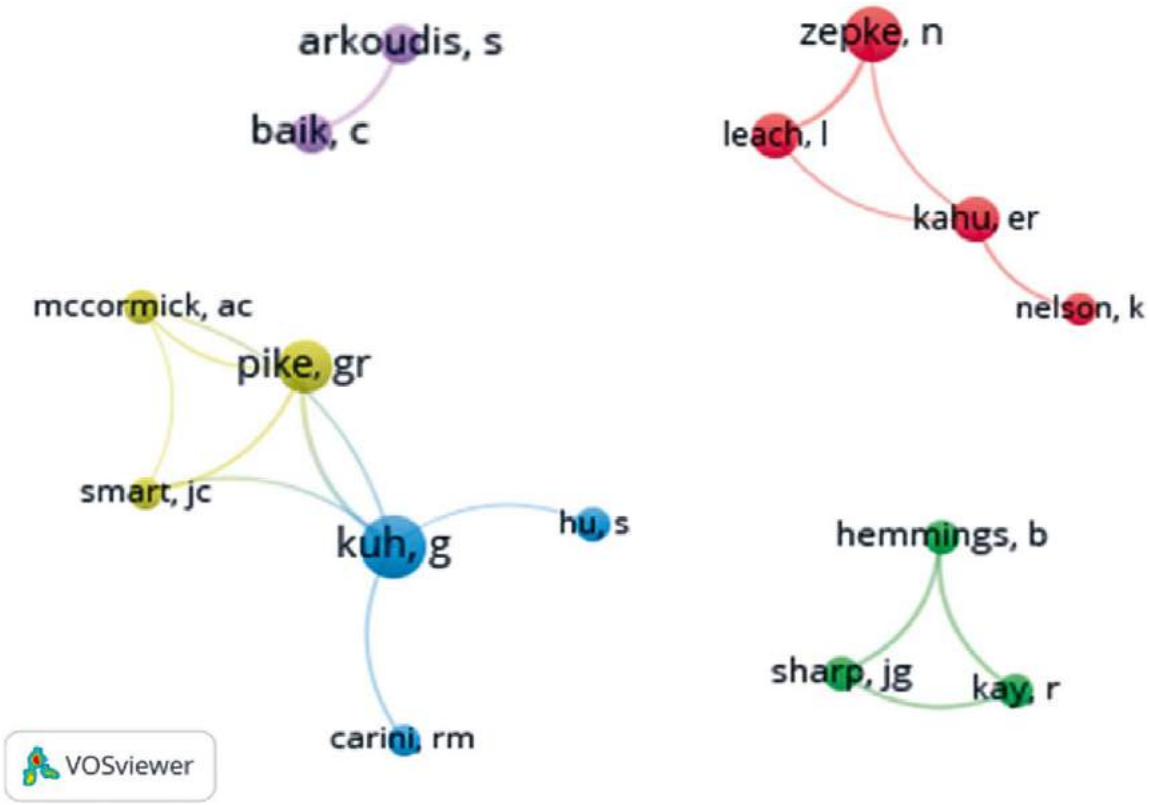
Abreviaturas: R = ranking; TP y TC: total de artículos y citas.

4. Principales grupos y corrientes de investigación

La tabla 1 presenta los autores más citados del tópico SEHE. Teniendo en cuenta las publicaciones de cada autor, observamos que Kuh, G.D. es sin lugar a dudas el autor más productivo e influyente en las primeras etapas del desarrollo del tópico (T1 y T2).

La figura 2 muestra un mapa de coautorías elaborado para identificar grupos de investigación entre los autores con más artículos publicados en el tópico SEHE, y poder analizar las temáticas de la investigación que desarrollan.

Figura 2
Grupos de investigación en el tópico SEHE



Nota: autores con tres o más artículos publicados y al menos una relación de coautoría (VOSviewer software).

En el mapa observamos que hay catorce autores que conforman cuatro grupos de investigación independientes. Según la afiliación institucional de los autores y el contenido de sus principales publicaciones, identificamos cuatro corrientes de investigación. La tabla 2 recoge las publicaciones más relevantes que aparecen relacionadas en cada grupo de autores del tópico SEHE, así como las principales aportaciones.

La *corriente de la Calidad* es la principal, tanto por número de autores relacionados por el total de artículos que tienen en común, como por el número de citas que han recibido. En la red de estos cinco autores se relacionan veintitrés artículos. Todos ellos son autores afiliados a universidades americanas y Kuh es el autor que genera el nodo de conexión central entre el resto de autores de la red Este grupo de autores tiene el honor de haber elaborado el sistema

de clasificación de las instituciones educativas basado en la experiencia del estudiante que emerge desde *National Survey of Student Engagement* (NSSE[1], 2007), adaptado también a la educación superior *High School Survey* of *Student Engagement* (HSSE). Se ha utilizado a nivel internacional, con adaptaciones a los sistemas universitarios de varios países (por ejemplo: USA, Canadá, UK, Australia) asumiendo que a mayor SEHE, a mayor calidad de la oferta institucional.

*La corriente de la Conceptualización Holística está r*epresentada por cuatro autores afiliados a universidades neozelandesa, que conectan una red de 19 artículos. Este grupo de autores desarrolla sus investigaciones basándose en extensas revisiones bibliográficas para aportar marcos y reflexiones holísticas sobre el significado de SE y cómo lograrlo. El marco conceptual propuesto por Kahu (2010) ha sido ampliamente considerado en las investigaciones sobre SE. La investigación de este grupo de autores pone de manifiesto que el SE en su enfoque restringido solo se focaliza en los comportamientos institucionales y de los estudiantes. Por tanto, se traduce en un indicador genérico de la calidad del proceso de enseñanza aprendizaje y del éxito en los resultados alcanzados por los estudiantes. Sin embargo, los autores del enfoque holístico, amplían el concepto del SE relacionándolo con todo un ecosistema sociocultural en el cual actúa como el pegamento que une al aula, a las personas y a la comunidad en un sentido amplio, contribuyendo la formación integral del estudiante.

La corriente del Aburrimiento está representada por tres autores conectados únicamente por tres artículos. Es el resultado de la colaboración entre Australia y el Reino Unido. Concretamente, estos autores contribuyen con nuevos fundamentos teóricos planteados desde la perspectiva del aburrimiento, y generan una nueva herramienta de diagnóstico del SE desarrollada a partir de *Farmer and Sundberg's Boredom Proneness Scale* (BPS). Esta nueva escala está diseñada específicamente para evaluar o medir la predisposición habitual de los estudiantes a aburrirse y la aportación de estos autores es adaptarla a la educación superior, utilizando datos de estudiantes de centros de educación superior del Reino Unido, de ahí que se re-denomine BPS-UKHE.

La corriente de los Perfiles Internacionales está representada por dos autores que conectan una red de tres artículos. Los dos autores son colegas en la misma universidad australiana. Una característica del sistema australiano de educación superior es el creciente número de estudiantes internacionales que acoge, lo que representa un gran potencial para incrementar el aprendizaje de ambos perfiles de estudiantes, locales y extranjeros. Este grupo de autores estudia en qué medida la docencia universitaria puede promover la interacción lingüística y cultural a partir de la diversidad de perfiles de los estudiantes. Los autores de esta corriente también elevan la cuestión de la integración de los estudiantes extranjeros a una cuestión comunitaria, más allá del ámbito universitario. Además, el sistema australiano de educación superior pone un gran énfasis en la integración de los estudios con el empleo profesional. Por todo ello, la escala del *Australian Survey of Studens Engagement* (AUSSE) incluye cuestiones específicas para analizar el grado de integración del estudiante en la comunidad, así como otras para analizar la creciente tendencia de los estudiantes a comprometerse con un empleo remunerado mientras estudian.

[1] http://nsse.indiana.edu/

Tabla 2

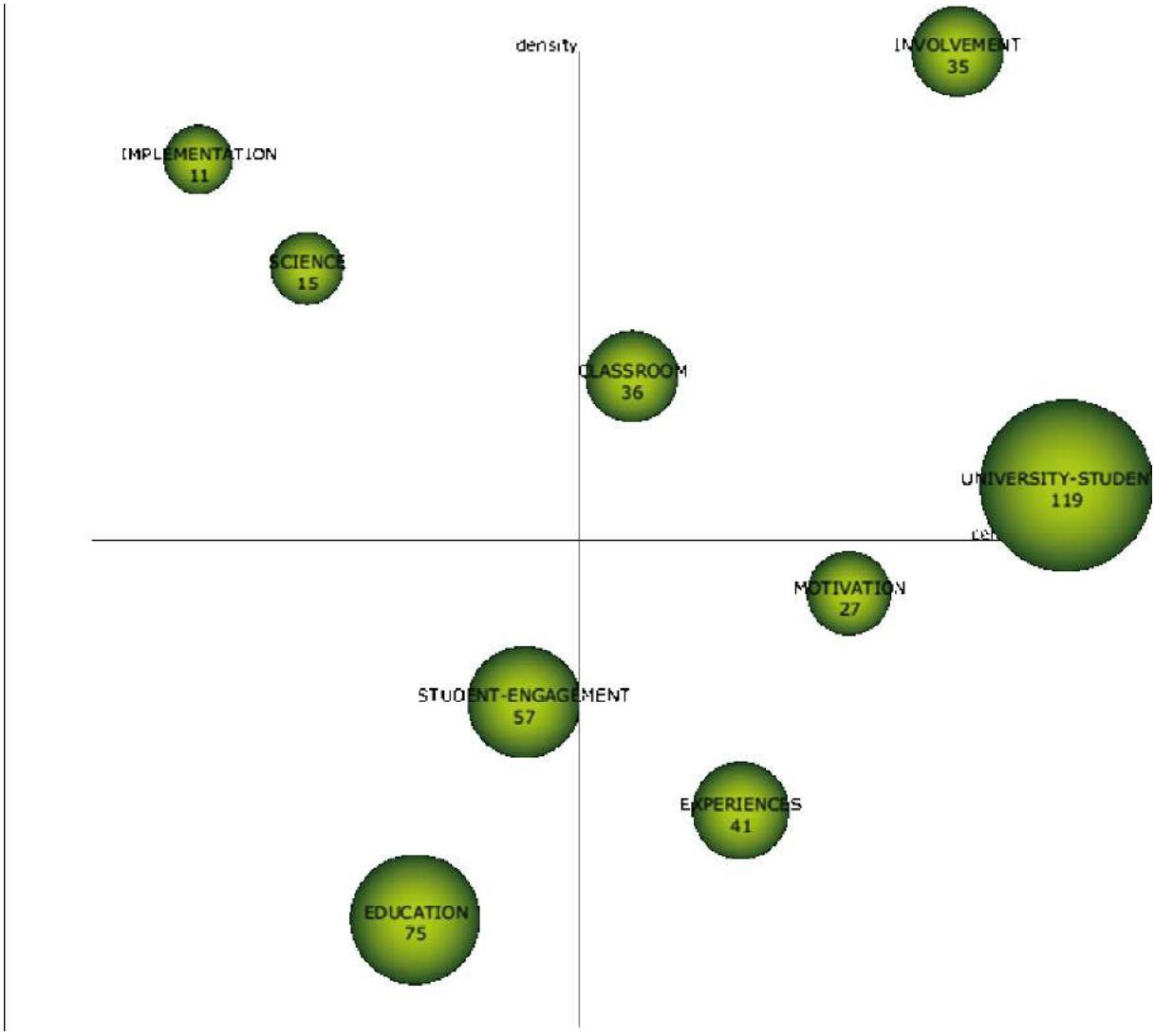
Publicaciones más relevantes de cada corriente investigadora en el tópico SEHE

Corriente de la Calidad	
Más de 150 citas	
Carini *et al.*, 2006	Examina la relación entre SE y el rendimiento académico
Kuh 2009	Revisa contribuciones académicas e institucionales sobre SE y su relevancia para el desempeño y la experiencia del estudiante.
Más de 100 citas	
Hu and Kuh 2002	Relaciona niveles de SE con características individuales, institucionales y de contexto social.
Laird and Kuh 2005	Relaciona niveles de SE con el uso de tecnologías de la información a partir de datos del NSSE.
Menos de 50 citas	
Pike and Kuh 2005	Propone un enfoque de clasificación institucional basado en la experiencia de los estudiantes.
Corriente de la Conceptualización Holística	
Más de 150 citas	
Kahu 2013	Marco conceptual holístico para SE.
Menos de 50 citas	
Leach and Zepke 2011	Revisa la bibliografía sobre las principales perspectivas de SE, sugiriendo indicadores para su medición.
Zepke 2014	Explora cuestiones críticas de la investigación sobre SE
Zepke 2015	Sobre la perspectiva holística del SE, aboga por la participación activa de los estudiantes en el aula y en la gestión del currículo y en un desarrollo comunitario más amplio a través de la ciudadanía activa crítica y el bienestar personal y social.
Zepke *et al.*, 2014	Estudia la relación entre el comportamiento del profesorado y el SE
Corriente del Aburrimiento	
Menos de 50 citas	
Sharp *et al.*, 2016	Realiza un estudio formal sobre el aburrimiento académico en HE y en Reino Unido, a través de una escala revisada (BPS-UKHE)
Sharp *et al.*, 2017	Estudia el aburrimiento académico combinando datos cuantitativos y la escala (BPS-UKHE) con datos cualitativos de encuestas semiestructuradas aplicadas en el sistema universitario británico..
Sharp *et al.*, 2018	Estudia el aburrimiento académico combinando datos cuantitativos y la escala (BPS-UKHE) y el *Approaches and Study Skills Inventory for Students* (ASSIST), enriquecidos con datos cualitativos de encuestas semiestructuradas aplicadas en el sistema universitario británico.
Corriente de los Perfiles Internacionales	
Menos de 50 citas	
Arkoudis *et al.*, 2013	Desarrolla el *Interaction for Learning Framework* (ILF), que identifica tres dimensiones clave para el diseño del *curriculum* para mejorar la relación entre diferentes grupos de estudiantes y los contextos de enseñanza aprendizaje.
Marangell *et al.*, 2013	Examina posibles estrategias y sugerencias prácticas para que las universidades avancen más allá de políticas específicas diseñadas para campus universitario y desarrollen el SE acompañadas y participando en una mayor comunidad local.
Naylor *et al.*, 2018	Define y valida cuatro escalas de medida de la experiencia del estudiante universitario a partir de la AUSS (*Australian Survey of Student Engagement*).

5. Análisis temático

Para identificar las temáticas de investigación principales del tópico SEHE y su estadio de desarrollo, hemos elaborado un diagrama estratégico (figura 4) siguiendo a (Cobo *et al.*, 2011). Los ejes del diagrama, permiten caracterizar el grado de desarrollo de un tema, bien de forma autónoma (densidad) o bien de forma colateral, en relación a otros temas (centralidad). Se definen cuatro tipos de temáticas (Cobo *et al.*, 2011). De todas ellas, las temáticas emergentes son las ubicadas en el cuadrante inferior derecho, calificadas como *temáticas básicas o transversales*. Es decir, han recibido atención en la investigación en relación a otras temáticas del tópico, pero no tanta atención de forma autónoma como las temáticas situadas en el cuadrante derecho superior, o *temáticas motores*, que son más clásicas en el tópico. También de acuerdo con esta técnica de análisis, cada temática del diagrama estratégico queda asociada a una red de co-palabras que nos permiten matizar algunas perspectivas de interés en la propia temática.

Figura 4
Temáticas en el tópico SEHE entre 1998-2018 (SciMat software)



Concretamente las temáticas *básicas o transversales* en este diagrama son: a) *Motivación* y b) *Experiencias*. Y la red de co-palabras asociada a cada una de ellas la siguiente:

— *Experiencias*: alienación, preocupación, éxito y tecnología.
— *Motivación*: NSSE, SENSE —*Survey of Entering Student Engagement*—, autonomía y entorno.

Según este análisis podemos vislumbrar algunos de los principales gaps existentes en la investigación del tópico SEHE. Concretamente, hay temas que habiendo sido trabajados de manera colateral junto otras temáticas más clásicas del área, apuntan interés para una investigación específica en la que tomen protagonismo convirtiéndose en objeto principal del estudio. Estos temas son el de la *motivación*, relacionada con la deseada autonomía de los estudiantes y la influencia de las condiciones ambientales en su proceso formativo; y el de las *experiencias*, en este caso relacionadas con los sentimientos, pensamientos o emociones del estudiante (alienación, preocupación, éxito, etc.) durante su etapa universitaria y por las vivencias experimentadas. Por tanto, cabe concluir que las nuevas propuestas para la agenda investigadora de los docentes, ponen de manifiesto que la investigación en docencia en la educación superior cada vez más tiene como protagonista al estudiante en su dimensión personal o humana. Y que respecto a la medición a partir de encuestas (NSSE —*National Survey of Student Engagement*— and SENSE —*Survey of Entering Student Engagement*—) se pueden incorporar nuevas perspectivas en la recopilación de datos para avanzar en la conceptualización y operatividad del constructo del SE.

6. Limitaciones de la investigación

Las limitaciones de este estudio son debidas, por una parte, a la selección de los documentos para realizar el estudio bibliométrico y por otra, a la propia aplicación de las técnicas bibliométricas. Es decir, la selección de documentos a analizar se ha circunscrito a artículos, en los que el término SE aparece como palabra clave asignada por el autor o por la base de datos WoS, dejando fuera aquellos que, pudiendo tratar sobre la temática, no utilicen ese motor de búsqueda. En segundo lugar, los mapas generados con software de análisis bibliométrico como Vosviewer y SciMat, dependen de la selección de los parámetros necesarios para aplicar el procedimiento y han sido asignados de acuerdo a la experiencia de los investigadores.

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T2

Ikasleen inplikazioa bultzatzen duten esperientziak (Student Engagement)

Experiences that stimulate student engagement

Experiencias que estimulan la implicación del alumnado (Student Engagement)

Aprendizaje más Servicio: una Metodología de Aprendizaje Significativo para la formación en gestión de proyectos de Profesionales Sanitarios

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Resumen

La reforma curricular universitaria en carreras de salud nos desafía como académicos a innovar, buscando estrategias de enseñanza aprendizaje y evaluación que permitan una retroalimentación durante todo el proceso para que nuestros estudiantes adquieran de manera significativa los conocimientos, habilidades, actitudes y valores necesarios para ser profesionales integrales que sean capaces de resolver problemas del territorio donde están insertos. Para el logro de esto, se ha innovado desde el año 2016 con la estrategia de aprendizaje más servicio en la asignatura de Diseño y Gestión de Proyectos de la carrera de Nutrición, en asociatividad con el Programa Mujeres Jefas de Hogar, lo que nos ha permitido acercar la formación profesional a un contexto real, colocar al estudiante en el centro del proceso de aprendizaje y ser un aporte a nuestro entorno, dando cumplimiento así a la política de Responsabilidad Social Universitaria de nuestra Institución. La investigación pretende sistematizar la experiencia para su replicabilidad en otras carreras y contextos, y transformarse en una innovación, midiendo el impacto real en los estudiantes y comunidad, midiendo la percepción a través de aplicación de encuestas y realización de focus group, además del porcentaje de adjudicación de fondos y la comparación del rendimiento académico. El año 2017, se trabajó con 15 socias comunitarias. Se aplicó una encuesta de satisfacción a estudiantes, con resultados favorables y se midió el impacto en la adjudicación de los fondos de los años 2016 y 2017, llegando a una efectividad de 52%. La estrategia de Aprendizaje más Servicio ha permitido una vinculación constante de la Carrera con la comunidad, ha favorecido el aprendizaje significativo y fortalecer el logro de competencias actitudinales como la empatía, comunicación efectiva, compañerismo, responsabilidad, seguridad y trabajo en equipo.

Abstract

The university curricular reform in health careers challenges us as academics to innovate, looking for teaching-learning and evaluation strategies that allow a feedback throughout the process so that our students acquire in a meaningful way the knowledge, skills, attitudes and values necessary to be professionals integrals that are capable of solving problems of the territory where they are inserted. To achieve this, we have innovated since 2016 with the strategy of learning plus service in the subject of Design and Project Management of the Nutrition career, in association with the Women in Household Program, which has allowed us to bring professional training to a real context, place the student at the center of the learning process and be a contribution to our environment, thus fulfilling the University Social Responsibility policy of our institution. The research aims to systematize the experience for its replicability in other careers and contexts, and become an innovation, measuring the real impact on the students and community, measuring the perception through the application of surveys and the realization of the focus group, in addition to the percentage of allocation of funds and the comparison of academic performance. In 2017, we worked with 15 community members. A satisfaction survey was applied to students, with favorable results and the impact on the allocation of funds for the years 2016 and 2017 was measured, reaching an effectiveness of 52%. The Learning plus Service strategy has allowed a constant link of the Race with the community, has favored meaningful learning and strengthened the achievement of attitudinal competencies such as empathy, effective communication, companionship, responsibility, safety and teamwork.

1. Introducción

La incorporación de la metodología aprendizaje-servicio en la educación superior tiene impacto, debido a que otorga beneficios derivados de las actividades de reflexión, tanto académicos (habilidades de pensamiento complejo y solución de problemas), como de desarrollo personal (clarificación de valores, autoconocimiento) y curricular (mejora del proyecto y mejora de las actividades de servicio) (Barrios Araya, Rubio Acuña, Gutiérrez Núñez, & Sepúlveda Vería, 2012). A través de la estrategia de Aprendizaje más Servicio también se pueden trabajar valores Éticos en los Estudiantes (Arratia Figuerroa, 2008). Esta poderosa herramienta de aprendizaje y de transformación social permite que los estudiantes aprendan mientras actúan sobre las diversas necesidades del entorno con el objetivo de transformar la realidad mediante acciones de mejora, al tiempo que reflexionan de forma estructurada sobre la experiencia vivida (Aramburuzabala, 2013). También, genera resultados positivos en la formación integral de los estudiantes, desarrollándose habilidades, actitudes y valores como el compromiso social, el trabajo en equipo y la resolución de problemas (Jouannet, Salaes, & Contreras, 2013). Tiene un efecto positivo en los estudiantes, porque los concientiza sobre la utilidad de los conceptos universitarios y es un aliciente para involucrarse en experiencias sociales que muevan a la solidaridad y a sentir como propias otras realidades sociales (Duque, 2018), favorece el compromiso del estudiante con el aprendizaje, les permite visualizar la integración disciplinaria en el aprender haciendo, lo que a su vez les lleva a visualizar el quehacer profesional en forma temprana. (Tighe Neira, y otros, 2010), aspectos relevantes según los principios de educación en adultos para que se genere el aprendizaje significativo. Esta estrategia nos permite dar respuesta al desafío curricular y formativo de los rediseños curriculares , y también a dar respuesta a problemáticas de las profesiones, como es el descenso de la empleabilidad al primer año en carreras de salud como kinesiología (49,6%), nutrición (50,2%), fonoaudiología (54%) y enfermería (82,7%) que afecta a nuestro país en los últimos años (Mineduc, 2019), situación que nos impulsa a desarrollar competencias de emprendimiento con sello de responsabilidad social, como señala la Política de Vinculación con el Medio, que despliega la Responsabilidad Social Universitaria (RSU) para contribuir en la generación de oportunidades para los sectores más desfavorecidos y se esfuerza en la búsqueda de una mejor sociedad. En este sentido el trabajo se basa en la praxis por medio de principios éticos con miras al desarrollo social, cimentado en el compromiso de una sociedad mucho más inclusiva (Politica de VCM, 2015).

La innovación se ha desarrollado desde el año 2016, como piloto en la asignatura de diseño y gestión de proyectos de la carrera de nutrición, tributando al perfil de egreso y proporcionando competencias generales y especificas relacionadas con el diseño, elaboración y gestión de proyectos de emprendimiento y/o sociales en el ámbito de la nutrición y alimentación con integración de variables sociales, económicas y/o ambientales para dar respuestas integrales y pertinentes a una necesidad local, fomentando el trabajo en equipo. Para el logro de estas competencias y de la política de RSU institucional se ha aplicado la estrategia de Aprendizaje más Servicio en asociatividad con el "Programa Mujeres Jefas de Hogar" de la Municipalidad de Osorno. El aprendizaje más Servicio es una estrategia que rompe con la educación tradicional, la cual se ha caracterizado por un docente protagonista en el aula y un aprendizaje alejado de la realidad. Éste responde a las demandas de la sociedad y al desarrollo educativo-profesional, promoviendo la formación de ciudadanos competentes para comprender nuestro mundo, capaces de contribuir y aporta a su desarrollo (Esponoza Torres & Rodriguez La Prieta, 2015).

La innovación educativa para Jerez (2017) "se entiende como aquel proceso intencionado y permanente al interior de la institución educativa, que pretende provocar transfor-

maciones e impactos reales y positivos sobre: los aprendizajes de los estudiantes, el entorno y cultura institucional y la sociedad" (p.7). Considerando este concepto y con la intención de transformar nuestra nueva forma de hacer las cosas en una innovación, hemos sistematizado desde el año 2017 la experiencia, considerando las mejoras que han surgido desde la primera aplicación en año 2015, además de evaluar la percepción de los estudiantes y socias comunitarias cualitativamente y la medición de impacto en la adjudicación de los fondos.

El objetivo de este trabajo es sistematizar la experiencia de innovación y analizar la percepción de los estudiantes y socias comunitarias con la estrategia de Aprendizaje más Servicio, implementada en la Asignatura de Diseño y Gestión de Proyectos, el segundo semestre del año 2018. Además, de medir el impacto en el rendimiento académico pre y post innovación y en la adjudicación de fondos de las socias apoyadas.

2. Método

2.1. De la experiencia

La asignatura de Diseño y Gestión de Proyectos, se encuentra en el VI Semestre de la malla curricular de la Carrera de Nutrición y Dietética. Se consideró los lineamientos del "Itinerario y herramientas "para desarrollar un proyecto de aprendizaje-servicio" (Ministerio de Educación de Argentina, 2012).

La asignatura consta de 5 SCT en total, y se ejecuta en dos módulos de 9 semanas con 4 horas presenciales semanales y 4 horas autónomas cada uno. A continuación, se especifica la forma de trabajo:

- Primer módulo: dictado por un académico experto en proyectos, que realiza clases expositivas participativas, trabajo colaborativo, estudio de casos y simulación, para que los estudiantes adquieran los conocimientos y la practica suficiente para luego llevar a cabo la intervención.
- Segundo módulo: práctico, implica el trabajo en terreno y el diseño del proyecto con la tutoría de un académico Nutricionista. La organización de las sesiones incluye estrategias para motivar y disponer a los estudiantes a una apertura para integrar nuevos aprendizajes. Este módulo ha sido pensado como una experiencia que contribuirá a alterar las bases meta-cognitivas que el alumno(a) trae previamente y los predispondrá a una actitud activa para desarrollar sus propias competencias.

Las beneficiarias del Programa son mujeres entre los 18 y 65 años de Edad, que son Jefas de Hogar, pertenecientes a los tres primeros quintiles de ingreso y que se encuentres trabajando de manera dependiente, independiente o buscando trabajo.

La vinculación con las Socias Comunitarias se genera en primera instancia entre académicos y coordinadora, para identificar socias que posean un emprendimiento u idea de emprendimiento en el área de la Alimentación y Nutrición, para que nuestras estudiantes puedan asesorar técnicamente a las beneficiarias en el diseño y la postulación a proyectos para favorecer la adjudicación de los fondos y contribuir al desarrollo de capacidades, habilidades y competencias que mejoren sus condiciones de emprendimiento. Posterior a esto se firma carta de compromiso de participación.

Las actividades desarrolladas en el segundo módulo donde se implementa la estrategia de aprendizaje servicio contemplan las siguientes fases (Tabla 1):

Tabla 1
Fases de la estrategia de aprendizaje servicio y actividades desarrolladas

Fases	Actividad
1 Diagnóstico	—Se realiza la Presentación de la Metodología de A+S a los estudiantes y socios. —1.ª Reunión: para identificar motivaciones y expectativas del socio. Diagnostico.
2 Ejecución	—2.ª reunión con el socio comunitario. —Coordinar Visita de lugar de producción para levantar diagnostico. —Talleres y tutorías. —Presentación de avances para retroalimentación (3 propuestas de emprendimiento considerando diagnóstico realizado y motivaciones del socio comunitario). —3.ª Reunión con socios de consenso de idea de proyecto.
3 Cierre de la Actividad con Socias Comunitarias	—Actividad de cierre: Ceremonia Final (Profesores, Estudiantes, Socias Comunitarias, Ayudantes, Autoridades). —Entrega al socio comunitario del formulario completo de postulación al proyecto y certificados de participación.
4 Reflexión	—Reflexión permanente de los estudiantes. —Jornada de retroalimentación para evaluar los resultados de la experiencia.
5 Sistematización y Comunicación	—Medios Internos de la Universidad tales como: Página Web Ulagos. —Participación en Programa Radial Ulagos. —Presentación en seminarios, congresos.
6 Evaluación	—Sistema de evaluación del proyecto: instrumentos de evaluación, modalidad de la evaluación (diagnóstica, de proceso, de producto). —Encuesta a estudiantes y socios Comunitarios (Previo consentimiento informado) para conocer su opinión de la estrategia aprendizaje A+S y sugerencias de mejoras para la Asignatura. —Aplicar Focus Group a estudiantes para detectar fortalezas y debilidades en búsqueda de la mejora continua de la estrategia.

2.2. De la investigación

El método utilizado en la investigación es cualitativo con un diseño de acción participativa. La selección de los participantes de la investigación obedeció a un muestreo intencional. La participación fue de forma voluntaria, previa firma de consentimiento informado. Para evaluar la percepción de estudiantes se realizó un grupo focal y se aplicó encuesta de evaluación (Rial, 2015). En el caso de las socias comunitarias, se aplicó encuesta de evaluación, versión socio (Rial, 2015). La asignatura tuvo un total de 18 estudiantes inscritos el año 2018 y se trabajó con 6 socias comunitarias. La muestra de estudiantes que contestaron encuesta fue 16 y en el grupo focal participaron 6 estudiantes, un estudiante de cada grupo, con una duración promedio 45 minutos. El protocolo del grupo focal fue validado por 3 expertos y estuvo constituida por 5 categorías de ejes de conversación, que corresponden a las etapas del A+S, 13 subcategorías y sus respectivos ejemplos de preguntas generadoras de conversación.

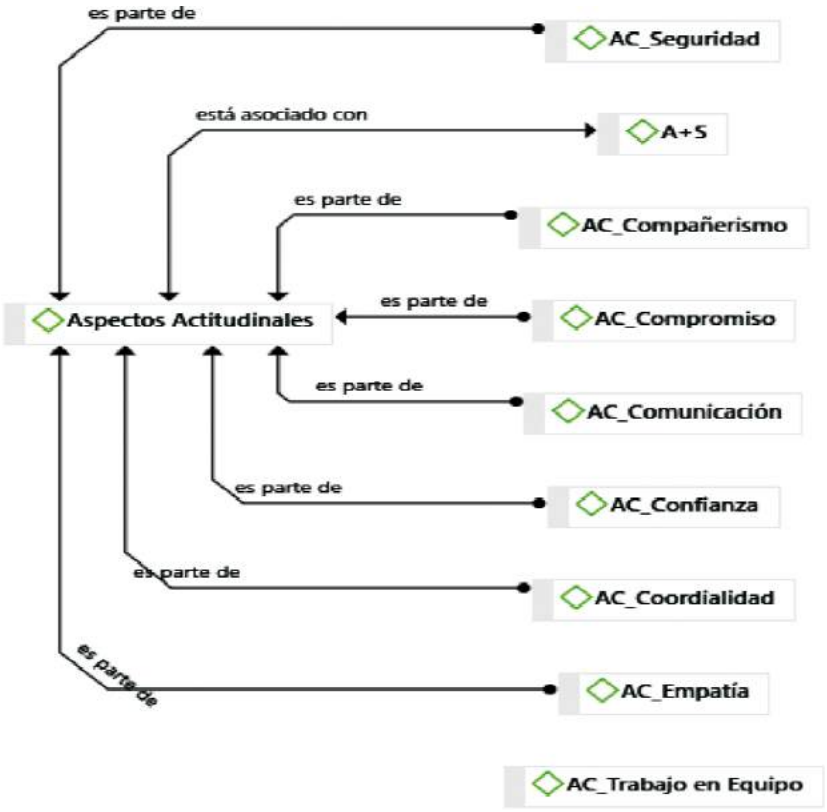
La muestra fue de 6 socias comunitarias y se aplicó encuesta evaluación proyecto A+S para socios comunitarios (Rial ,2015). Las encuestas fueron aplicadas al 100% de la muestra. Los grupos focales y encuestas trascritas, fueron codificados y analizados a través del programa ATLAS.ti 8.0, 20.0.

3. Resultados

La estrategia de aprendizaje más servicio permite la aplicabilidad del conocimiento previo adquirido en asignaturas anteriores. Al analizar el discurso de los estudiantes, éstos asocian el aprendizaje con conocimiento previo, retroalimentación y procesos de evaluación, destacando en este aspecto las rubricas de auto-evaluación y co-evaluación. Considerando la estrategia como generadora de aprendizaje significativo en donde se aplican conocimientos previos, se adquieren nuevos conocimientos, se fortalecen y desarrollan aspectos actitudinales. La motivación previa generada por las docentes de la asignatura y el contacto directo con las socias comunitarias favorecen el aprendizaje de los estudiantes: *"Creo que se notó en cada grupo e incluso se pudo ver en las presentaciones que mis compañeros de clase se habían esforzado para poder lograr los objetivos para que las socias se ganen los fondos".*

Figura 1

RED n.° 1: Aspectos actitudinales asociados a la estrategia de aprendizaje más servicio



Los aspectos actitudinales que son asociados por los estudiantes a la estrategia de aprendizaje más servicio son: seguridad, empatía, cordialidad, confianza, comunicación, compromiso, compañerismo y trabajo en equipo. El poner en práctica la habilidad de la comunicación al estar en contacto directo con la socia comunitaria favorece el fortalecimiento de la seguridad en el estudiante y en las competencias adquiridas durante su formación de pregrado, a modo de ejemplo se cita de forma textual: *"Y de hecho, ahí nos damos cuenta que sabemos, que se ha adquirido conocimiento, porque uno estudia para las pruebas acá encerrado, pero cuando salimos y ver que aporta un granito a la comunidad, ahí dimensionamos que todo va que-*

dando y va ayudando no solo a nosotros sino a otros también". Para las socias comunitarias, desde el punto de vista actitudinal es valorado el esfuerzo y la paciencia de los estudiantes *"Lo más valorado fue que los estudiantes tuvieron paciencia y se esforzaron mucho en el Proyecto que hicimos"*, como se menciona en la cita textual, las socias se consideran parte del equipo de trabajo del proyecto.

Las debilidades de la asignatura se encuentras asociadas con el tiempo de duración de la aplicación de la estrategia A+S y la coordinación de las reuniones entre socias y estudiantes por disponibilidad horaria. Las fortalezas de la asignatura se asocian a la estrategia de aprendizaje más servicio, la cual fortalece aspectos cognitivos y actitudinales de los estudiantes.

Las sugerencias de mejora para la asignatura se encuentran asociadas a las debilidades de tiempo y coordinación y las fortalezas, en relación a los procesos evaluativos de la asignatura, en donde se menciona que dicha estrategia permite: *"La vinculación con la comunidad"*, *"Unir la practica con lo teórico"* y en relación a los procesos evaluativos se destaca el conocimiento previo de las rubricas de evaluación y la auto-evaluación: *"Es que hay una pauta, igual entonces sirve para ir viendo si vamos bien o mal, entonces ahí uno puede ver en que se equivocó, en que está mal, de hecho nosotros tenemos conocimientos previos de la pauta de evaluación, así nos podemos preparar para dar una buena presentación"*. Para las socias comunitarias las sugerencias se encuentran relacionadas con el tiempo, y mencionan: *"Me hubiese gustado que haya sido más extenso el tiempo, es decir más veces que nos reunimos con las niñas"*, *"Que sea un poco más extendido para tener un poco más de aprendizaje en alimentación y preparaciones saludables"*.

Para las socias comunitarias la utilidad de la asesoría realizada por las estudiantes se relaciona con la ayuda, la orientación y conocimientos entregados, en donde mencionan: *"Por qué en el caso mío, ellas me orientaron en futuros proyectos al cual postular y así corregir los errores que cometí en el anterior proyecto"*, *"Por qué orienta de acuerdo al emprendimiento o actividad económica que se desarrolla y a que fondo concursable o proyecto postular"*. Cabe destacar que los estudiantes no solo entregaron conocimientos desde el punto de vista metodológico del diseño y gestión del proyecto, sino también desde la nutrición y marketing, entre otros, lo cual le permite integrar y aplicar conocimientos previos adquiridos en asignaturas anteriores, lo que fue muy valorado por las socias: *"El aspecto más valorable fue las orientaciones recibidas para producir alimentos más saludables y de esta manera poder captar más clientes"*.

4. Conclusiones / reflexiones

Las acciones de aprendizaje más servicio son planificadas desde el centro educativo en función de su proyecto educativo institucional, pero responden a una necesidad efectivamente sentida por la comunidad, como podemos visualizar en las percepciones de las socias. La relación de las instituciones educativas con la comunidad es entonces bidireccional y las iniciativas son protagonizadas por los estudiantes en alianza con la comunidad. La vinculación de la experiencia de servicio con los contenidos curriculares y planes de estudio, permite fortalecer los contenidos académicos con el aprendizaje que se produce en el desarrollo del servicio, y permitir que los estudiantes perciban todo el conocimiento previo que traen, visualicen la realidad regional y sientan la utilidad de su conocimiento y profesión para otros, brindándoles además seguridad y experiencia. La alianza establecida, nos permite impactar en el entorno y lograr que nuestros estudiantes a través de su trabajo con la comunidad sean un aporte a nuestra región, generándose el anhelado aprendizaje significativo, ya que vivencian el proceso desde la etapa diagnóstico y deben indagar e investigar requisitos de fondos concursables para emprender, asesorar en materia de producción de alimentos y nutrición, activando conocimientos previos y poniendo en práctica competencias actitudinales.

Es clave, contemplar un profesional nutricionista o de la disciplina en el módulo práctico, ya que favorece los aspectos mencionados anteriormente, porque permite la retroalimentación desde la mirada de proyectos, y también desde la mirada profesional.

El impacto de la estrategia es positivo para estudiantes y socias comunitarias, existiendo un alto grado de satisfacción al igual que el año 2017. En relación al mejoramiento de indicador de aprobación al incorporar la estrategia de A+S se visualiza que ha evolucionado positivamente de un 96,2% en 2016, 98,5% en 2017 a un 100% en 2018, lo que demuestra un impacto no solo a nivel de formación competencial, sino que también en el rendimiento académico.

Finalmente, este recurso pedagógico entrega herramientas que facilitan la concreción de nuestra misión institucional y la realización de una actividad académica de impacto social, contribuyendo a la formación de profesionales integrales, por lo que es replicable a otras carreras de salud y disciplinas. El próximo desafío, es además contemplar el sello de la formación interprofesional de nuestro Departamento en el diseño de la asignatura de Diseño y gestión de proyectos en salud que se implementara en el año 2021 para todas las carreras.

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Aportes del aprendizaje experiencial al desarrollo de competencias genéricas en estudiantes de Enfermería en un curso de Psiquiatría

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Abstract

Psychiatry courses demand the development of competencies such as empathic understanding, inclusion, public responsibility and ethics in their students. Experiential Learning is a methodology that can respond to this demand, since it favors student participation and proposes the democratization of teaching through strategies that respond to the need to adapt to current social circumstances. It incorporates complex learning approaches, allowing interactivity, collaboration and mutual learning, as well as addressing both cognitive and affective aspects. To describe the contributions of experiential learning in the development of generic competencies in nursing students in a psychiatry course. To extend the scope of Experiential Learning to other nursing courses and other health disciplines. Quantitative, descriptive, transversal study, whose sample was composed of 77 students (out of a universe of 80). A specially designed anonymous survey was applied, composed of 7 items with Likert scale responses. All participants were asked to sign an informed consent form. The data were analyzed using Excel software. There were 7 men and 70 women, between 19 and 24 years old. 97.4% of the students made a positive evaluation (very much in agreement or in agreement) that the methodology favors the inclusion of people with psychiatric illnesses. 98.7% make a positive assessment that the methodology favours the development of public responsibility competence and ethical competence. 98.7% give a positive evaluation of the methodology to provoke a change of attitude towards mental illness. 98.7% make a positive evaluation of the theoretical understanding of the contents and of the increase in their perception of learning. Finally, 98.7% of students also make a positive evaluation of the recommendation of the course to other students. Experiential learning successfully contributes to the development of generic competencies such as inclusion, public responsibility and ethics, as well as a change of attitude of nursing students who participated in a psychiatry course.

Resumen

Los cursos de psiquiatría demandan el desarrollo de competencias como la comprensión empática, la inclusión, responsabilidad pública y la ética en sus estudiantes. El Aprendizaje Experiencial es una metodología que puede responder a esta exigencia, ya que favorece la participación estudiantil y plantea la democratización de la enseñanza mediante estrategias que responden a la necesidad de adaptarse a las circunstancias sociales actuales. Incorpora complejos enfoques de aprendizaje, permitiendo la interactividad, colaboración y aprendizaje mutuo, además de abordar aspectos tanto cognitivos como afectivos. Describir los aportes del aprendizaje experiencial en el desarrollo de competencias genéricas en estudiantes de enfermería en un curso de psiquiatría. Ampliar los alcances del Aprendizaje Experiencial a otros cursos de enfermería y otras disciplinas de salud. Estudio cuantitativo, descriptivo, transversal. Se aplicó una encuesta anónima especialmente diseñada, compuesta de 7 ítems con respuestas en escala de tipo Likert y 1 ítem con respuesta afirmativa o negativa. A todos los participantes se les solicitó la firma de consentimiento informado. Los datos fueron analizados mediante programa computacional Excel. Participó una muestra de 77 estudiantes (de un universo de 80) (7 hombres y 65 mujeres), grupo compuesto de 5 hombres y 72 mujeres, con edades entre los 19 y 24 años. Un 97,4% de los estudiantes realiza una evaluación positiva (muy de acuerdo o de acuerdo) con que la metodología favorecer la inclusión de personas con enfermedades psiquiátricas. Un 98,7% hace evaluación positiva que la metodología favorece el desarrollo de la competencia responsabilidad pública y competencia ética. Un 98,7% hace evaluación

positiva de la metodología para provocar un cambio de actitud hacia la enfermedad mental. Un 98,7% hace evaluación positiva de la comprensión teórica de los contenidos y del aumento de su percepción de aprendizaje. Finalmente, también un 98,7% de los estudiantes hace evaluación positiva de la recomendación del curso a otros estudiantes. El aprendizaje experiencial contribuye exitosamente al desarrollo de competencias genéricas como la inclusión, responsabilidad pública y ética, además de un cambio de actitud de los estudiantes de enfermería que participaron en curso de psiquiatría.

Palabras clave: Aprendizaje centrado en el alumno, Educación universitaria, Enfermedades mentales.

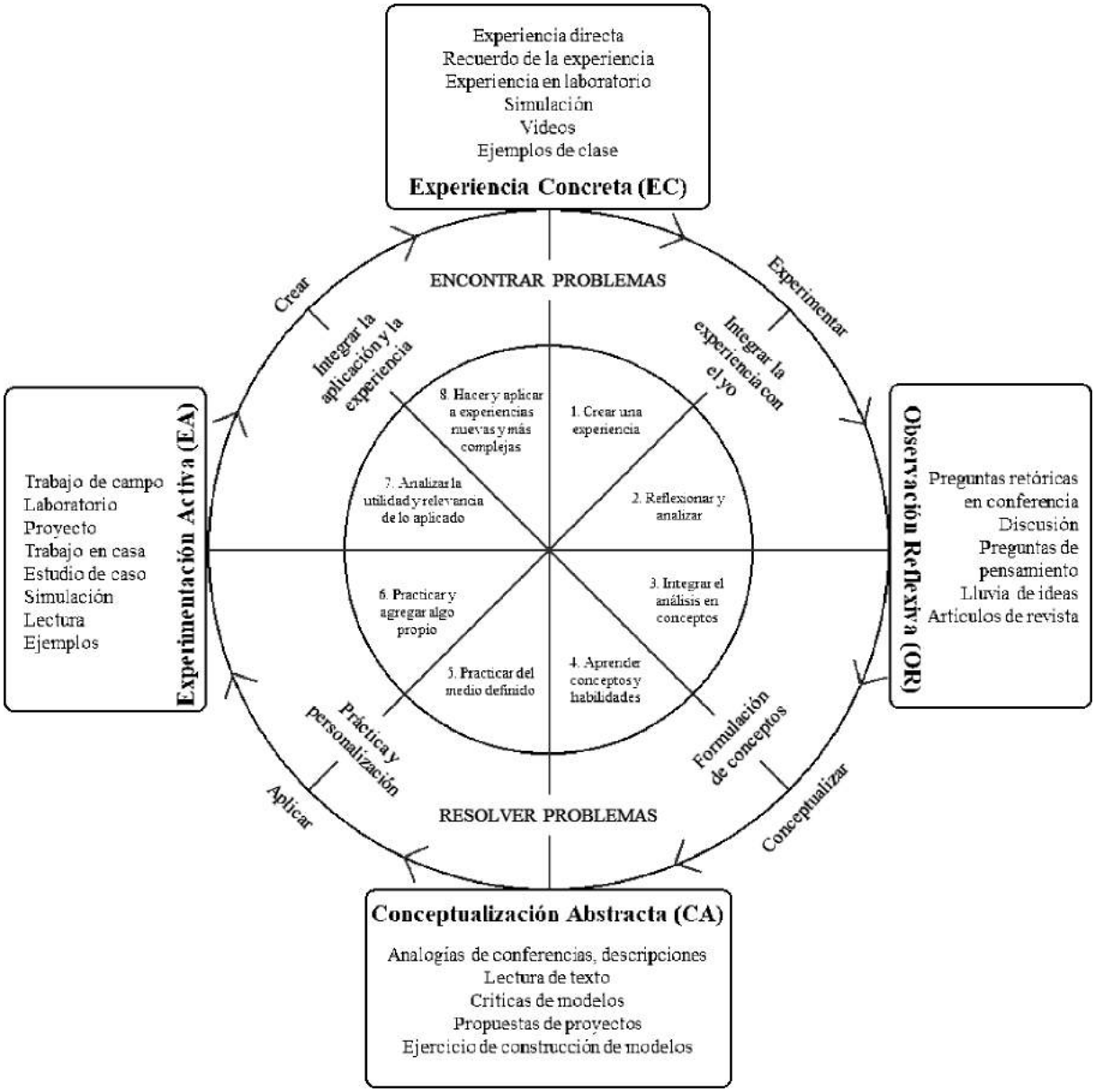
1. Antecedentes

Aprendizaje Experiencial

El Aprendizaje Experiencial (AE), es una metodología ampliamente desarrollada en el entorno educacional norteamericano de principios del siglo xx y originalmente descrita en el año 1938 (Dewey, 1960). Favorece la participación estudiantil y plantea la democratización de la enseñanza (Piña & Amador, 2015), mediante estrategias que responden a la necesidad de adaptarse a las circunstancias sociales actuales. Una de sus principales características la superación de las limitaciones del paradigma educacional tradicional, que históricamente ubica al estudiante en una posición pasiva y como un mero receptor de conocimientos (Romero, 2010). Incorpora además diferentes y complejos enfoques de aprendizaje (Gómez, 2007), permitiendo la interactividad entre los estudiantes. Promueve también la colaboración y el aprendizaje mutuo entre pares (estudiantes), además de abordar aspectos tanto cognitivos como afectivos del aprendizaje, a la misma vez que fomenta el aprendizaje activo (Gutiérrez *et al.*, 2011). De acuerdo a un análisis contemporáneo, el AE puede llegar a constituirse como un modelo de aprendizaje de adultos, en que un grupo de personas organiza su aprendizaje a partir de "tareas de resolución de problemas", haciendo del aprendizaje un proceso motivador y provechoso (Pérez, 2018). De acuerdo a Schön (1992), uno de los elementos característicos del AE es el involucramiento del individuo en una interacción directa con el fenómeno que se está estudiando, y no solo una descripción intelectual o contemplación distante. Se logra entonces a través de esta metodología que el estudiante sea partícipe de un proceso de reflexión personal que otorgue significado a la experiencia vivida (Romero, 2010).

Es a partir del trabajo de Dewy (constructivista) y de los avances realizados por Schön (Andragogía), que David Kolb diseñó un modelo de aprendizaje experiencial compuesto de cuatro ejes, descritos como experiencia concreta (EC), observación reflexiva (OR), conceptualización abstracta (CA) y experimentación activa (EA) (Kolb, 2015). En la EC, el estudiante capta y percibe nueva información a través de los sentidos, del contacto con lo concreto, con los aspectos tangibles de la experiencia. Se incluyen en esta etapa actividades como la simulación, observación, videos y conjuntos de problemas. En la OR el estudiante procesa la experiencia otorgando sentido observando la experiencia y reflexionando sobre la conexión entre lo que se hace y las consecuencias de las acciones. Se incluyen en esta etapa actividades como preguntas de procesamiento, lluvia de ideas y discusiones, entre otras. En la CA el estudiante obtiene nueva información (percibe) pensando. Por medio del pensamiento obtiene nuevos conceptos, ideas y teorías que orientan la acción. Se incluyen en esta etapa actividades como analogías y construcción de modelos, entre otros. Finalmente, en la EA el estudiante comprende y procesa la nueva información haciendo, implicándose en nuevas experiencias y experimentando en forma activa para comprender (Bergsteiner *et al.*, 2010; Gómez, 2007).

Figura 1
Adaptación del Modelo 4MAT (McCarthy, 1981), complementado con la traducción al español del Modelo de aprendizaje experiencial de Kolb (1984, adaptado por Svinicki y Dixon en 1987)



Fuente: Bergsteiner *et al.*, 2010.

Tal como se describiese en el análisis cualitativo realizado en el contexto de esta misma investigación, a través del AE el proceso de aprendizaje conduce al estudiante a construir conocimiento mediante un proceso de "dar sentido" a las experiencias. Este proceso posee la ventaja de ser relativamente sencillo al permitir visualizar en un mismo esquema el proceso de aprendizaje (con las etapas por las que pasa el estudiante cuando aprende), junto a los modos en los que se adquiere nueva información y se transforma en algo significativo. Incor-

pora finalmente, los estilos individuales de aprendizaje, entendidos como los diferentes modos en los que se tiende a abordar el proceso de aprendizaje (Gómez, 2007). Tanto las etapas como las actividades y segmentos pueden observarse con mayor claridad en la Figura 1.

Formación de Estudiantes de enfermería en el área de la psiquiatría

Con la reforma psiquiátrica que partió en Europa (Alonso, 2014) y la posterior promulgación del Plan Nacional de Salud Mental y Psiquiatría con enfoque comunitario en nuestro país (Ministerio de Salud de Chile [MINSAL], 2017), se planteó un desafío cultural y social de generar un mayor nivel de bienestar, que permita acceder oportunamente a los apoyos o tratamientos que cada persona y familia necesita, minimizando la discapacidad y marginación social, además de aceptar y crear espacios de integración para personas con enfermedades mentales (MINSAL, 2017).

El fenómeno de la exclusión es vivido por los pacientes psiquiátricos como una forma de diferenciación social entre los que están "dentro" (incluidos) y los que están "fuera" (excluidos), en todo orden social, familiar, económico, educacional, laboral, entre otros. Según el Modelo de AE y sus componentes, el aprendizaje sería un proceso por medio del cual se construye conocimiento reflexivo, dando sentido a las experiencias vividas, lo que en el ámbito de la salud mental y psiquiatría es fundamental tanto para el estudiante de pregrado de enfermería en proceso de formación, como para las personas susceptibles de ser atendidas en contextos clínicos de alta segregación y fenómenos como la exclusión (Minoletti & Zaccaría, 2005).

Asumir una conducta activa e intencionada frente a fenómenos como estos son un deber del Estado y sus instituciones (Minoletti & Zaccaría, 2005), dentro de la cuales las universidades y organismos educacionales son los responsables de revertir la exclusión o segregación en la formación de sus estudiantes. De esta manera es necesario adecuar las metodologías de aprendizaje en pos de la formación de profesionales respetuosos de la diversidad (Universidad del Desarrollo, 2017), capaces de generar cuidados de enfermería especializados (Universidad del Desarrollo, 2016a), y de aceptar y generar espacios de integración para personas con enfermedades mentales.

Desarrollo de competencias genéricas y disciplinares

Para la universidad en la que se realizó la medición, es un deber formar profesionales respetuosos de la diversidad (Universidad del Desarrollo, 2017). Se plantea dentro de sus valores institucionales la no discriminación y valoración de la diversidad como una forma de promover el respeto mutuo entre sus integrantes, los que se materializan en los objetivos estratégicos del Plan 2025 para la formación de pregrado de sus estudiantes, con el perfeccionamiento de la vinculación con el medio y la extensión del EA para la potenciación del proceso de formación (Universidad del Desarrollo, 2016b). De acuerdo al Proyecto Educativo, la Universidad centra su proceso educativo no sólo en la formación disciplinar, sino también en la formación de valores y actitudes que serán parte de los atributos fundamentales que se forjarán en el egresado como un sello distintivo (Universidad del Desarrollo, 2015). El desarrollo de competencias genéricas como la ética y responsabilidad pública, deben asegurar en el estudiante la reflexión acerca de problemas del contexto social y la toma de decisiones tendientes al bien común (Universidad del Desarrollo, 2016a), todas ellas altamente sintonizadas con el Modelo de AE.

Para dar respuesta a este imperativo, es que se diseñó un curso de pregrado de enfermería en psiquiatría según AE y las cuatro etapas del Modelo (Kolb, 2015). Se incluyó actividades en cada etapa del Modelo como el uso de paciente estandarizado, análisis de videos, reflexiones grupales, práctica clínica en centros hospitalarios, entre otras. Se analizó en un primer momento los resultados desde el paradigma cualitativo (año 2018) y en este artículo se presentan los resultados desde la medición cuantitativa.

2. Método

Estudio cuantitativo, descriptivo y transversal, cuya muestra estuvo compuesta de 77 estudiantes (de un universo de 80). Se aplicó una encuesta anónima especialmente diseñada, compuesta de 7 ítems con respuestas en escala de tipo Likert de cuatro alternativas descritas como Muy De Acuerdo (MDA), De Acuerdo (DA), En Desacuerdo (ED) y Muy En Desacuerdo (MED). Se consultó a los participantes por el nivel de adquisición de la competencia. A todos los participantes se les solicitó la firma de consentimiento informado después de la autorización del Comité de Ética y Curricular de la Carrera, y cautelando los Principios Éticos de Emanuel (Rodríguez, 2004). Los datos fueron analizados mediante programa computacional Excel.

3. Resultados

Participaron 7 hombres y 70 mujeres, con edades que fluctúan entre los 19 y 24 años. Un 97,4% de los estudiantes que participó de la investigación realizó una evaluación positiva de la metodología como medio para favorecer la inclusión de personas con enfermedades psiquiátricas, es decir, está muy de acuerdo o de acuerdo con la aseveración planteada. Un 98,7% de los estudiantes que participó de la investigación hizo una evaluación positiva de la metodología para favorecer el desarrollo de la competencia responsabilidad pública y competencia ética, es decir, está muy de acuerdo o de acuerdo con la aseveración planteada. Un 98,7% de los estudiantes que participó de la investigación realizó una evaluación positiva de la metodología para provocar un cambio de actitud hacia la enfermedad mental, es decir, nuevamente está muy de acuerdo o de acuerdo con la aseveración planteada. Un 98,7% de los estudiantes que participó de la investigación realizó una evaluación positiva de la comprensión teórica de los contenidos y del aumento de su percepción de aprendizaje (también muy de acuerdo o de acuerdo con la aseveración planteada). Finalmente, también un 98,7% de los estudiantes que participó de la investigación realizó una evaluación positiva de la recomendación del curso a otros estudiantes. Todos los resultados anteriormente expuestos son observables en la Figura 2.

Figura 2

Gráfico de resultados generales de la evaluación cuantitativa, aportes del aprendizaje experiencial al desarrollo de competencias

4. Conclusión

El aprendizaje experiencial contribuye exitosamente al desarrollo de competencias genéricas como la inclusión, responsabilidad pública y ética, además de un cambio de actitud de los estudiantes de enfermería que participaron en un curso de psiquiatría para enfermería de pregrado. Por otro es posible ampliar los alcances del aprendizaje experiencial a otros cursos de enfermería y otras disciplinas de salud con el objetivo de formar profesionales respetuosos de la diversidad y garantes de los derechos de las personas con enfermedad mental y sus familias.

Agradecimientos

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Flipped Classrom en la educación de enfermeras de tercer año: cómo convertir la formación en un espacio de aprendizaje

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Abstract

Background: the curricular training in nursing students has two main axes, the theoretical and the practical, in conjunction, provide the knowledge and technical skills that the student will require in their future work performance, allowing the development of critical thinking. Various investigations show that students who participate in active methodologies considering the pillars of the Flipped Classroom model, obtain an improvement in problem solving in relation to those students who do not use them. It is possible to talk about an active learning that promotes the participation of the students in some activity that forces them to reflect on the ideas and on how they are using them. Objectives: To evaluate the integration of knowledge of care management in a patient with acute respiratory pathologies in 3rd year nursing students, through the implementation of the Flipped Classroom model. Method: Cross-sectional descriptive study. A pre and post intervention test and a method satisfaction instrument were applied to 76 students. The data was analyzed using frequency and contingency tables, using the software STATAv.14. Results: in the evaluation of the integration of knowledge, the grades obtained between the pre and post test increased in the percentage of students who obtained a score between 7-6.0 from 29% to 63%. being statistically significant (p = 0.00). Considering the maximum grade 7.0. The student's satisfaction with the methodology was very successful, distributing between 100% to 92% in the statement in full agreement. Discussion: the integrative objective that this project had, in relation to the nursing care process in specific pathologies care is evidenced as a beneficial construct in this learning process of the nursing student, despite the complete and progressive integration of this knowledge in the application of care to a patient is evolutionary and in which the main role is obtained by direct modeling with the clinical tutor within a real scenario. Conclusion: we consider fundamental as a previous and effective training the use of this type of educational methodologies before the student faces the direct attention with the user.

RESUMEN

Introducción: la formación curricular en enfermería tiene dos grandes ejes, la teórica y la práctica que, en conjunción, aportan los conocimientos y las habilidades técnicas que el estudiante requerirá en su desempeño laboral futuro, permitiendo el desarrollo del pensamiento crítico. Diversas investigaciones demuestran que los estudiantes que participan en metodologías activas considerando los pilares del modelo Flipped Classroom, obtienen una mejora en la resolución de problemas en relación a aquellos estudiantes que no las utilizan. Es posible hablar de un aprendizaje activo que promueve el involucramiento de los estudiantes en alguna actividad que les obligue a reflexionar sobre las ideas y sobre cómo las están utilizando. Objetivo: Evaluar la integración de conocimientos de la gestión del cuidado en un paciente con patologías respiratoria aguda en estudiantes de enfermería de 3er año, a través de la implementación del modelo de Flipped Classroom. Método: Estudio descriptivo transversal. Se aplicó un test pre y post intervención y un instrumento de satisfacción de la metodología a 76 estudiantes. Los datos fueron analizados utilizando tablas de frecuencia y contingencia, mediante el software STATAv.14. Resultados: en la evaluación de la integración del conocimiento las notas obtenidas entre el pre y post test aumentaron en el porcentaje de alumnos que obtuvieron nota entre 7-6,0 de un 29% al 63%. siendo estadísticamente significativa (p = 0,00). Considerando la nota máxima 7,0. La satisfacción del estudiante con la metodología es muy buena, distribuyéndose entre el 100% al 92% en la afirmación totalmente de acuerdo. Discusión: el objetivo integrativo que tuvo este proyecto, en relación al proceso de atención enfermero en cuidados de patologías especificas se evidencia como un constructo beneficioso en este proceso de aprendizaje del estudiante de enfermería, no obstante la integración completa y progresiva de

estos conocimientos en la aplicación del cuidado a un paciente tiene carácter evolutivo y en la cual el rol principal lo obtiene el modelamiento directo con el tutor clínico dentro de un escenario real. Conclusión: consideramos fundamental como un entrenamiento previo y efectivo el uso de este tipo de metodologías educativas antes que el estudiante se enfrente a la atención directa del usuario.

Palabras clave: Flipped Classrom, formación, estudiantes enfermería.

1. Antecedentes

Enfermería es el arte del cuidar, no existe otro profesional que tenga descrito dentro de sus áreas de desempeño la funcionalidad del cuidar. Este cuidado no es experiencial, sino en base a conocimientos teórico-prácticos que sustentan el quehacer de la disciplina.

Para lograr esto la carrera de Enfermería tiene en su malla curricular diferentes cursos teóricos-prácticos, los cuales van integrando a lo disciplinar los contenidos de los cursos de ciencias básicas u otras disciplinas. Al interior de la carrera se considera fundamental que el estudiante no solo adquiera conocimiento (aprendizaje conceptual), sino también, que sea capaz de aplicarlo correctamente (aprendizaje procedimental), en esta línea es que se eligió el modelo de Flipped Classroom, donde se fomenta en el estudiante el rol activo en el proceso de enseñanza-aprendizaje, con la constante asesoría y acompañamiento del docente, con la finalidad de dar respuesta a la problemática identificada (1-2). Al tener contenidos teóricos y prácticos se requiere que los estudiantes practiquen de forma activa la aplicación de estos antes de ir a práctica clínica, si el estudiante anticipadamente se enfrenta a situaciones similares en un ambiente protegido estará mejor preparado para las prácticas clínicas

Diversas investigaciones demuestran que los estudiantes que participan en metodologías activas considerando los pilares del modelo Flipped Classroom, obtienen una mejora en la resolución de problemas que aquellos estudiantes que no participaron, proporcionándole una estrategia de aprendizaje integral que le permite el cumplimiento de los objetivos de enseñanza (1,2,3). El Flipped classroom entonces, es el modelo que permite a los docentes ocupar más tiempo en la interacción directa con el estudiante, aumenta la motivación de estos últimos, al aprender en un ambiente controlado, lo que le entrega más confianza al momento de actuar, así también, ayuda a mejorar el rendimiento por medio de la retroalimentación constante del cuerpo docente, que no se preocupa de entregar solo retroalimentación sumativa, sino que también, formativa (4). Este modelo permite centrarse en el estudiante como foco primordial.

Básicamente, es posible hablar de un aprendizaje activo que promueve el involucramiento de los estudiantes en alguna actividad que les obligue a reflexionar sobre las ideas y sobre cómo las están utilizando (5). El trabajo no presencial que asume el alumno con este modelo, fuera de clases, potencia un aprendizaje autónomo que resulta de suma importancia para ampliar su propio aprendizaje, de una forma más profunda y activa.

Es por esto que mediante esta experiencia se logra la construcción de conocimientos basados en el proceso de atención enfermero mediante la búsqueda y síntesis de la información, para luego triangular este proceso a través de la integración del conocimiento en el desarrollo de cuidados de enfermería para una patología específica. Permitiendo la transferencia de conocimientos desde el aula a la práctica, entregando a los estudiantes capacidades cognitivas, psicomotrices, y experiencias de aprendizaje, que mejoraron el desarrollo del pensamiento crítico, la resolución de problemas, la toma de decisiones y el análisis de datos.

Se considera relevante ir cambiando algunas de las estrategias metodológicas de enseñanza-aprendizaje tradicional, como son las clases expositivas, potenciando el desarrollo de

aprendizajes significativos en los estudiantes. Fomentando así, en los estudiantes, no ser un receptor de información, sino un actor responsable de su propia formación, activo y participativo, transformándose en un protagonista de su aprendizaje y el docente en un facilitador que guía el proceso de manera personalizada (6). Esto permitirá al alumnado desarrollar competencias específicas e interpersonales o transversales, posibilitando el desarrollo de habilidades cognitivas de orden superior.

Con la implementación de este modelo, se quiere dar respuesta al siguiente objetivo: Evaluar la integración de conocimientos de la gestión del cuidado en un paciente con patologías respiratoria aguda en estudiantes de enfermería de 3er año, a través de la implementación del modelo de Flipped Classroom.

2. Método

Estudio cuantitativo, descriptivo transversal. Se aplicó un test pre y post intervención y un instrumento de satisfacción de la metodología a 76 estudiantes, los que estaban divididos en dos secciones, la primera con 38 y la segunda con 38 estudiantes respectivamente. Los datos fueron analizados utilizando tablas de frecuencia y contingencia, mediante el software STATAv.14. A todos los participantes se les solicitó la firma de consentimiento informado y se cautelaron los Principios Éticos de Emanuel.

3. Resultados

En la evaluación de la integración del conocimiento las notas obtenidas entre el pre y post test aumento en el porcentaje de alumnos que obtuvieron nota entre 7-6,0 de un 29% al 63%. siendo estadísticamente significativa en ambas secciones (p = 0,00). Considerando la nota máxima 7,0 (Tablas 1 y 2).

Tabla 1

Sección 1 de estudiantes, resultados de las notas Pre y Post test de conocimientos "Atención de enfermería del usuario con Insuficiencia respiratoria aguda con Ventilación Mecánica"

	Pre Test	Post Test
Media	4.91	5.91
Varianza	1.70	0.53
Observaciones	38	38
Coeficiente de correlación de Pearson	0.33	
Diferencia hipotética de las medias	0	
Grados de libertad	37	
Estadístico t	–4.84	
P(T<=t) una cola	.01	
Valor crítico de t (una cola)	1.69	
P(T<=t) dos colas	.01	
Valor crítico de t (dos colas)	2.03	

Tabla 2
Sección 2 de estudiantes,
resultados de las notas Pre y Post test de conocimientos
"Atención de enfermería del usuario con Insuficiencia respiratoria aguda con Ventilación Mecánica"

	Pre Test	Post Test
Media	4.50	5.62
Varianza	1.29	.71
Observaciones	38	38
Coeficiente de correlación de Pearson	.35	
Diferencia hipotética de las medias	0	
Grados de libertad	37	
Estadístico t	–5.97	
P(T<=t) una cola	.00	
Valor crítico de t (una cola)	1.69	
P(T<=t) dos colas	.01	
Valor crítico de t (dos colas)	2.03	

La satisfacción del estudiante con la metodología es muy buena, distribuyéndose entre el 100% al 92% en la afirmación totalmente de acuerdo en 20 de 22 aseveraciones. Hay una solamente evaluada con un 84% y otra en el 58% en relación a la aseveración si el tiempo de la simulación fue adecuado (Tabla 3).

Tabla 3

Porcentaje de respuesta Instrumento de satisfacción del estudiante con la metodología

	Totalmente de acuerdo	Medianamente de acuerdo	En desacuerdo	Muy en desacuerdo	No contesta
Recursos audiovisuales					
La calidad de los videos era apropiada en cuanto a imagen y sonido.	97%	3%			
El contenido de los videos es coherente con las actividades realizadas en clases.	100%				
Tuve oportunidad de acceder a los videos en más de una ocasión.	100%				
La revisión de videos me resultó motivante y dinámica como medio de estudio.	99%	1%			
El contenido de los videos me permitió participar de manera activa en clases.	100%				
Clases presenciales					
Las actividades realizadas en clases se relacionan con los contenidos de los videos.	99%	1%			
Las actividades de la clase se relacionan con los controles realizados antes de la clase.	100%				
La dinámica de la clase es activa, centrándose en el desarrollo de actividades y no en la exposición de contenidos.	99%	1%			
Mi aprendizaje en el aula es más autónomo al tener conocimiento previo de los contenidos.	100%				
Las actividades realizadas en clases son desafiantes para mi aprendizaje.	95%	4%	1%		
Metodología Flipped Learning					
Esta metodología me permitió identificar las actividades derivadas del cuidado de enfermería para esta patología	95%	5%			
Me permitió gestionar el tiempo para estudiar de acuerdo a mis posibilidades.	84%	15%	1%		
Me permitió mejorar mi desempeño en la asignatura.	93%	7%			
Me parece que es una manera interesante y motivante de aprender.	100%				
La metodología es recomendable para ser utilizada en otras asignaturas.	100%				
La metodología me permitió ser protagonista en mi propio aprendizaje.	96%	3%	1%		
Metodología Simulación					
El escenario fue coherente con lo visto en el resto de las actividades.	96%	4%			
El tiempo fue el adecuado	58%	31%	11%		
Esta metodología me permitió mejorar mi desempeño en el proceso de atención de enfermería en esta patología	95%	4%			1%
Se logró la aplicación de los contenidos en simulación semejando la atención directa de enfermería	93%	4%	1%	1%	
El uso de simulación favoreció mi aprendizaje para esta patología	92%	8%			
La metodología es recomendable para ser utilizada en otras asignaturas.	97%	3%			

4. Discusión

El objetivo integrativo que tuvo este proyecto, en relación al proceso de atención enfermero en cuidados de patologías especificas se evidencia como un constructo beneficioso en este proceso de aprendizaje del estudiante de enfermería, no obstante la integración completa y progresiva de estos conocimientos en la aplicación del cuidado a un paciente tiene carácter evolutivo y en la cual el rol principal lo obtiene el modelamiento directo con el tutor clínico dentro de un escenario real.

5. Conclusión

La implementación del Modelo Flipped Classroom contribuye a que en los estudiantes mejoren la comprensión de contenidos fundamentales a ser aplicadas en la atención de enfermería de una persona con Insuficiencia Respiratoria. Considerando fundamental el modelo de flipped claassroom como un entrenamiento previo y efectivo antes que el estudiante se enfrente a la atención directa del usuario.

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Estimulando la implicación del alumnado en economía ecológica mediante juegos colaborativos

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Abstract

Game-based learning refers to the use of game thinking and mechanics to engage and motivate students in the learning process. We applied this innovative concept to complement the theoretical sessions of an introductory course on ecological economics in the Faculty of Economics and Business of the University of the Basque Country (UPV/EHU). A participatory simulation game originally developed by Capellán-Pérez *et al.* (2019) in the context of energy and sustainability education was adapted for this course; and at the same time, the theoretical sessions were reshaped to enhance the learning experience of the gaming. The pedagogical effect of the whole course was evaluated with a previous and posterior questionnaire. The results show that this combined strategy is especially suited to motivate and engage students into the discipline of ecological economics, as well as in order to promote team work and collaborative thinking. We also observed that students gained a better global vision and interrelation between the topics discussed during the course and a greater capacity to understand and interiorise the global socio-environmental crisis that humanity is currently facing.

Resumen

El aprendizaje basado en juegos (game-based learning) hace referencia al uso de estrategias y mecanismos propios de los juegos para activar y motivar a los estudiantes en el proceso de aprendizaje. Hemos aplicado este concepto innovador para complementar las sesiones teóricas de un curso de introducción a la economía ecológica en la Facultad de Economía y Negocios de la Universidad del País Vasco (UPV/EHU). Para este curso se adaptó un juego de simulación participativa, desarrollado originalmente por Capellán-Pérez *et al.* (2019) en el contexto educativo de la energía y la sostenibilidad; y, al mismo tiempo, las sesiones teóricas fueron reestructuradas para mejorar la experiencia del juego. El efecto pedagógico de todo el curso fue evaluado con un cuestionario anterior y posterior. Los resultados muestran que esta estrategia combinada es especialmente adecuada para motivar y comprometer a los estudiantes en la disciplina de la economía ecológica, así como para promover el trabajo en equipo y el pensamiento de colaboración. También hemos observado que los alumnos adquirían una mejor visión global y de la interrelación entre los temas debatidos durante el curso y una mayor capacidad para comprender e interiorizar la crisis socio-ambiental global a la cual se enfrenta la humanidad en la actualidad.

1. Introducción

Las investigaciones científicas demuestran que el actual sistema socioeconómico está llevando al mundo hacia la sobreexplotación y el colapso (Meadows 2004; Rockström *et al.*, 2009; Steffen *et al.*, 2015). Se necesitan medidas de control globales urgentes y radicales para evitar las consecuencias catastróficas del calentamiento global y la superación de otros límites planetarios (Anderson & Bows 2011; IPCC 2014; Ripple *et al.*, 2017; UN, 2019).

El principal problema que afronta el análisis económico bajo el paradigma dominante neoclásico es que pretende resolver estos problemas dentro de la dinámica del crecimiento económico, sin tener en cuenta que el sistema económico no es sino un subsistema del sistema natural (es decir está limitado por los límites biofísicos de nuestro planeta), y, por lo tanto, no puede crecer indefinidamente (Daly, 1991; Georgescu-Roegen, 1996). La economía ecológica se aparta de este paradigma, abandonando la ideología del crecimiento y buscando una economía compatible con la biosfera (Costanza, 1999; Daly, 2005, 1991; Daly *et al.*, 1993; Daly and Farley, 2011; Martínez Alier, 1999; Martínez Alier *et al.*, 1998).

Por lo tanto, la transición hacia un sistema económico sostenible es un desafío mundial que, además de cambios estructurales de la propia economía, requiere de un cambio sustancial en el comportamiento y valores (especialmente en las sociedades occidentales con un consumo material disparado) con el fin de reescalar las necesidades y los deseos bajo los límites de la disponibilidad de los recursos naturales y la compatibilidad con los ciclos de la biosfera. La eficacia de las medidas de política sostenible requiere una colaboración activa entre las personas, las regiones y las instituciones políticas del mundo, lo cual pone de relieve la necesidad de facilitar a los participantes del curso un profundo entendimiento, tanto de la gravedad del problema, como de la complejidad de las soluciones.

De hecho, la enseñanza sobre la economía ecológica y la sostenibilidad no es una tarea fácil dadas las dificultades cognitivas que los seres humanos tienen en la comprensión del funcionamiento de los sistemas complejos. La relación entre las sociedades humanas y la biosfera es principalmente dinámica, regida por continuas retroalimentaciones, no lineales, adaptables, auto-organizadas y evolutivas, mientras que nuestros modelos mentales tienden a ser limitados, lineales y estáticos (Sterman, 2012).

Hoy en día las facultades de economía presentan una falta general de crítica al paradigma neoclásico que sustenta el sistema económico actual (por ejemplo, el imperativo del crecimiento) y, por lo tanto, queda muy poco espacio para enfoques alternativos como el de la economía ecológica. En este contexto, el curso anual de Economía Ecológica en la Facultad de Economía y Empresa de la Universidad del País Vasco (30-40 estudiantes por año) comenzó como un intento de incluir estos conceptos en el programa de estudio. El curso, de 20 horas, fue concebido inicialmente como un curso de introducción a la economía ecológica basado en la investigación a través de un proceso de aprendizaje integral.

En su quinta edición (2018), se incorporó una estrategia de gamificación al proceso de aprendizaje que adapta el juego de simulación participativa MEDEAS-Encrucijada desarrollado por el Grupo de Dinámica de Energía, Economía y Sistemas de la Universidad de Valladolid en el contexto de la educación sobre energía y sostenibilidad. Los objetivos de esta estrategia híbrida que combina sesiones teóricas con la gamificación fueron:

— (1) proporcionar a los estudiantes una mejor comprensión de la magnitud y las posibles consecuencias de la crisis medioambiental global;
— (2) promover el pensamiento reflexivo colectivo sobre los temas del curso;
— (3) reconocer la importancia del acceso y la evaluación crítica de la información y sus fuentes;
— (4) implementar un pensamiento multidisciplinario para comprender e interiorizar mejor el vínculo entre los nuevos conocimientos adquiridos y los desafíos que afrontan en sus propias vidas,
— (5) proporcionar conocimientos para ayudar a los participantes a concebir y aplicar activamente soluciones en su vida personal y colectiva.

El uso de un juego de simulación participativo estuvo motivado por la necesidad de mejorar la motivación y la participación de los estudiantes a través de la experiencia adquirida en escenarios prácticos con métodos y datos científicos actualizados. El enfoque del aprendizaje basado en juegos (ABJ) también tuvo como objetivo reforzar su motivación para buscar soluciones imaginativas a los problemas ambientales a los que se enfrenta nuestro planeta.

El artículo presenta la aplicación de una estrategia de juego como una herramienta de aprendizaje innovadora, capaz de motivar y comprometer a los estudiantes. Además, se describe el desarrollo de un procedimiento de aprendizaje autónomo, participativo y colaborativo. El efecto pedagógico de la estrategia ABJ aplicada al curso de introducción a la economía ecológica se evaluó con un cuestionario anterior y posterior. El resto del artículo está estructurado en 4 secciones, de la siguiente manera. A continuación, se presentan algunos conocimientos sobre el funcionamiento de la metodología de aprendizaje basada en juegos; La Sección 3 proporciona el procedimiento de monitoreo y evaluación; La sección 4 resume y discute los principales resultados de la innovación educativa y, finalmente, la sección 5 termina con las contribuciones de la metodología y las principales conclusiones del artículo.

2. Metodología: aprendizaje basado en juegos

2.1. Diseño del curso

El juego de simulación participativa MEDEAS-Encrucijada (Capellán-Pérez *et al.*, 2019) se eligió como eje vertebrador del curso de aprendizaje basado en la investigación en economía ecológica dado su estado científico actual y se desarrolló de manera coherente con los principios fundamentales de la Economía Ecológica. La estrategia de juego permite la participación activa de los estudiantes en el proceso de aprendizaje, así como una evaluación reflexiva de su proceso de decisión mediante la ejecución iterativa de un modelo de análisis integrado energía-economía-medio ambiente. Los principales objetivos del juego son dos: 1) sensibilizar sobre la gravedad de la crisis medioambiental mundial que afrontan los seres humanos y (2) entender que se pueden adoptar diferentes enfoques para abordar estas cuestiones basadas en diferentes criterios éticos o ideológicos. El juego en última instancia permite a los estudiantes interiorizar que nuestras necesidades (o deseos) están limitadas por las restricciones biofísicas.

La *Fig. 1* muestra cómo el juego de simulación fue fundamental para los temas tratados durante el curso.

Fue necesario un trabajo previo con el fin de integrar la dinámica del juego ya existente con los objetivos del curso. La idea era adaptar el juego a los temas del curso y, al mismo tiempo, adaptar los contenidos de las lecciones teóricas de forma transversal a los requisitos del juego. De esta manera, los estudiantes podrían participar y resolver los temas discutidos en las sesiones de enseñanza y relacionarlos con los desafíos que el cambio climático y el agotamiento de los recursos naturales representan para las sociedades humanas que ellos experimentan durante el juego. Esta problemática se puso en común en un taller entre todos los profesores antes del curso, decidiéndose adaptar y desarrollar material de enseñanza específico para facilitar y agilizar el juego de simulación, así como adaptar y simplificar el juego de simulación participativa a los requisitos del curso. Este material de enseñanza se desarrolló en coordinación entre el personal docente y los diseñadores del juego de simulación siguiendo una estructura y nomenclatura comunes.

Figura 1
MEDEAS-Encrucijada ABJ aproximación a la economía ecológica

La *Tabla 1* presenta los temas tratados en las diferentes lecciones teóricas del curso.

Tabla 1
Descripción de las lecciones teóricas del curso de economía ecológica

Día	Duración	Tema	Código
1	70 min	Transición hacia una economía sostenible	M1
	70 min	Evaluación de los servicios ecosistémicos	M2
	70 min	Principales retos del cambio climático	M3
2	70 min	Gestión y transporte de residuos	M4
	70 min	Economía y deuda ecológica	M5
	70 min	Transición energética sostenible	M6

2.2. Sesión del juego de simulación participativa

La estrategia de juego se organizó en un proceso cooperativo de aprendizaje por equipos, siguiendo la metodología de Aprendizaje en Equipo del Alumno (Devries and Edwards, 1973). La actividad se llevó a cabo en la sesión final del curso por equipos heterogéneos de alumnos que buscaban el aprendizaje cooperativo dentro de los grupos (entre compañeros). Dado que cada equipo tiene diferentes percepciones sobre las tendencias actuales y las posibles soluciones, los resultados entre los grupos no son directamente comparables y, por lo

tanto, la competencia directa entre los grupos no tiene sentido. El objetivo era comparar y discutir en grupo el nivel de logro de los objetivos del juego de simulación entre diferentes equipos. Un facilitador en cada grupo ayudó a los participantes a resolver sus dudas y usar la interfaz gráfica MEDEAS-Encrucijada.

El horizonte de las simulaciones se estableció a mediados de siglo (2050-80) por dos razones principales. En primer lugar, las evaluaciones científicas apuntan al hecho de que, para entonces, la descarbonización de la socio-economía global debería haber progresado sustancialmente (<80-95% de emisiones de GEI en relación con 1990 siguiendo la Hoja de Ruta de la Energía de la UE (European Commission, 2011) o las recomendaciones del IPCC (IPCC, 2014)), por lo que las medidas para evitar un cambio climático peligroso deberían comenzar de inmediato. En segundo lugar, desde el punto de vista del desarrollo tecnológico, las nuevas tecnologías requieren algunas décadas para evolucionar. Esto hace que sea razonable considerar en ese horizonte solo las tecnologías actuales probadas.

Por tanto, el primer paso fue la constitución de grupos. En nuestro caso, fueron 5 grupos con 4-5 miembros. Una vez constituidos los grupos, se invitó a los participantes a que seleccionasen las hipótesis clave. Las hipótesis son dos supuestos (no condicionados por decisiones humanas) que el juego de simulación requiere como punto de partida: (H1) disponibilidad futura de recursos energéticos no renovables (petróleo, gas, carbón y uranio); y (H2) nivel de impactos futuros del cambio climático para la misma emisión de gases de efecto invernadero.

El tercer paso fue realizar una simulación de la extrapolación de las tendencias actuales según lo percibido por los participantes. El objetivo principal de este paso fue visualizar dónde nos podrían llevar las tendencias actuales en 2050-2080. A la luz de los resultados obtenidos, los participantes podrían decidir colectivamente establecer algunos objetivos deseables: objetivos ambientales (estabilización de la temperatura promedio global, O1) y objetivos de bienestar (usar la disponibilidad futura de energía per cápita, O2). Los objetivos podrían ser modificados durante el juego; asimismo los participantes también pueden ampliar con más objetivos a medida que fuera evolucionando el juego.

Tabla 2
Relación entre las lecciones, la hipótesis, los objetivos y las políticas

Tema	Código	Hipótesis	Objetivos	Políticas
Transición hacia una economía sostenible	M1			P2, P10
Evaluación de los servicios ecosistémicos	M2			P4, P6
Principales retos del cambio climático	M3	H2	O1	P12
Gestión y transporte de residuos	M4			P9, P11
Economía y deuda ecológica	M5			P1, P3
Transición energética sostenible	M6	H1	O2	P5, P6, P7, P8

En el siguiente paso, los participantes empezaron a construir escenarios que les permitían de manera iterativa entender la dinámica del sistema complejo humanidad-naturaleza y los dilemas éticos detrás de las diferentes opciones. El primer escenario de extrapolación de tendencias actuales sirve para visualizar adónde caminamos sin políticas adicionales, y sirve como base para la comparación de las simulaciones alternativas siguientes. Para ello,

podían definir un conjunto de 12 objetivos de políticas: (1) Crecimiento de la población, P1; (2) Crecimiento previsto del PIB per cápita, P2; (3) evolución de la estructura de la economía mundial, P3; (4) Implementación de un programa de reforestación para capturar CO_2, P4; (5) Capacidad de energía nuclear planificada, P5; (6) Producción planificada de biocombustibles líquidos, P6; (7) Capacidad de energía renovable planificada para la producción de electricidad, P7; (8) Capacidad de energía renovable planificada para la producción de calor, P8; (9) estructura del sistema de transporte, P9; (10) Cambio tecnológico planificado, P10; (11) tasa de reciclaje de minerales, P11; y (12) evolución de otras emisiones de GEI además de la quema de combustibles fósiles, P12. La contextualización y definición de estas hipótesis (H), objetivos (O) y políticas (P) fueron cubiertas por las clases teóricas como se presenta en la *Tabla 2*.

La fase final la constituye una discusión grupal incluyendo a todos los participantes de todos los grupos. En este punto, cada grupo presentó brevemente sus resultados, reflexiones y comentarios de las simulaciones que habían ejecutado. También se llevó a cabo una discusión general entre los participantes con la ayuda de los facilitadores. Este último paso tuvo como objetivo conectar la experiencia de juego de los participantes con los temas tratados durante el curso. El objetivo final del juego fue proporcionar a los participantes en el curso orientaciones en política de planificación estratégica y en los dilemas éticos que surgen de la evaluación de su viabilidad o aceptabilidad.

3. Seguimiento y evaluación

Con el fin de evaluar el seguimiento y la evaluación del proceso del ABJ, se desarrollaron dos encuestas, una antes del curso y la otra, justo después de la sesión de juego. Varias de las preguntas aparecieron en ambas encuestas. A cada estudiante se le pidió que indicara en cada encuesta un código personal y anónimo para permitir la comprobación cruzada y, por lo tanto, el análisis comparativo de las respuestas antes y después del curso.

La primera encuesta consistió en 14 preguntas, organizadas en tres secciones. Primero, se presenta una batería de preguntas para recopilar información personal y opiniones generales sobre temas relacionados con la economía. Posteriormente, se presentan un conjunto de preguntas sobre el cambio climático y las políticas climáticas internacionales. La encuesta termina con algunas preguntas sobre la propia metodología de aprendizaje. El segundo cuestionario también se dividió en 3 secciones, incluyendo 14 preguntas adicionales en total. En este caso, la primera sección recopila información sobre el nivel de satisfacción de los estudiantes y la posible influencia del curso sobre ellos. La segunda y tercera secciones, mantienen los mismos contenidos de la encuesta inicial, con preguntas idénticas para fines de comparación y otras que las complementan. Para que las preguntas de la encuesta se respondieran con una escala de evaluación, se utilizó un método de evaluación similar a Likert, con un rango de calificación entre un mínimo de 6 y un máximo de 10.

4. Resultados y discusión

En esta sección, presentamos los principales resultados obtenidos en la evaluación del curso, particularmente en lo que respecta a la evaluación de la estrategia de juego. Desde un punto de vista pedagógico, nuestro objetivo fue evaluar la claridad de los objetivos del curso, la motivación de los estudiantes, las interacciones entre los estudiantes y los impactos personales de los contenidos del curso. Además, desde el punto de vista de los contenidos, se pre-

tende evaluar principalmente la información recibida (cantidad y calidad) y la medida en que la información recibida se adaptó al interés de los participantes.

El cuestionario previo fue completado por 20 estudiantes, mientras que la encuesta posterior fue completada por 24 estudiantes. Después de verificar los cuestionarios anteriores y posteriores, se identificaron 19 pares de cuestionarios. Por lo tanto, solo hemos considerado estos 19 pares de cuestionarios para el análisis de datos. La muestra está compuesta por un 16% de hombres y un 84% de mujeres. Todos los participantes tienen estudios superiores y la edad promedio fue de 31 años.

En general, se pudo comprobar que la mayoría de asistentes al curso ya tenían una elevada consciencia de la actual crisis ambiental. Tal y como muestra el análisis del cuestionario previo, todos los estudiantes creían que el cambio climático tendrá efectos negativos o muy negativos en el bienestar humano si las tendencias actuales continúan. En una escala de 1 a 10, su preocupación promedio por los problemas globales fue de 9. En cuanto a la evaluación de la estrategia de juego, a los participantes se les preguntó previamente si tenían algún conocimiento sobre metodologías docentes innovadoras, en general, y sobre estrategias de aprendizaje basadas en juegos, en particular. Casi el 80% de los estudiantes habían trabajado previamente en entornos de enseñanza innovadores. Sin embargo, solo el 52,63% de los participantes había oído hablar de metodologías de aprendizaje basadas en juegos. A pesar de ello, el 100% de los participantes consideró que el uso del juego de simulación como metodología de enseñanza era adecuado y que habían entendido su propósito y funcionamiento. De manera similar, todos los participantes consideraron que el uso de una metodología de aprendizaje basada en juegos era más motivador y/o que había influido en su iniciativa de estudio. MEDEAS-Encrucijada obtuvo excelentes resultados cuando se pidió a los participantes que calificaran en una escala de 1 a 10 si el juego hubiera sido; comprensible (7.90), entretenido (8.74), útil en términos de aprendizaje (8.95) o riguroso y objetivo (8.17).

En la misma línea de valoraciones positivas, existe un acuerdo generalizado en cuanto a que el aprendizaje basado en juegos; facilita el apoyo mutuo entre compañeros, contribuye a crear sensación de equipo, mejora el ambiente en el aula, fomenta la comunicación y ayuda a afianzar los conocimientos adquiridos durante el curso.

Por último, el cuestionario posterior mostró que el juego de simulación MEDEAS-Encrucijada fomenta la participación e implicación en el curso y motiva a investigar sobre los temas tratados. Además, los participantes declararon claramente que, en comparación con los cursos más tradicionales, el entorno de juego les había ayudado a comprender mejor el problema y sus consecuencias.

5. Conclusiones

Los resultados de las investigaciones científicas muestran que el sistema económico actual está llevando al mundo hacia la sobreexplotación y el colapso. La economía tradicional no aborda este problema y presenta como solución los mismos principios que han traído a la sociedad moderna a una crisis de sostenibilidad semejante. En este contexto, la economía ecológica redefine la economía clásica, proponiendo un análisis más amplio en el que la cuestión económica es una parte de los complejos procesos dinámicos de la biosfera. Con el objetivo de incluir la economía ecológica en los currículos académicos de la Facultad de Economía y Empresa de la Universidad del País Vasco (UPV/EHU), un curso de introducción a esta disciplina celebró su quinta edición en octubre de 2018. En esta edición se incluyó una estrategia

de ABJ en el proceso de aprendizaje, adaptando para ese fin un juego de simulación participativa MEDEAS-Encrucijada recientemente desarrollado por Capellán-Pérez *et al.* (2019).

La adaptación del juego a las especificaciones del curso, así como la adaptación del curso a los requisitos del juego, se llevaron a cabo conjuntamente entre los diseñadores del juego y los docentes del curso. Mientras que el juego se celebró durante la última sesión del curso, en las sesiones anteriores se presentaron los conceptos teóricos con especial énfasis en la introducción y el desarrollo de los conceptos necesarios para ser utilizados como aportes al juego colaborativo MEDEAS-Encrucijada.

Se realizó un seguimiento de la metodología de aprendizaje combinada con dos encuestas, una antes del inicio del curso y otra, justo después del juego. Los estudiantes valoraron positivamente el juego, aceptando que era comprensible, útil para fines de aprendizaje, riguroso y entretenido. Por otro lado, considerando el método de aprendizaje, los estudiantes coincidieron en gran medida en que el juego ayudó a afianzar los conceptos teóricos recibidos durante las lecciones teóricas, a aumentar la comunicación entre estudiantes y profesores/moderadores, a mejorar la atmósfera de aprendizaje, a fomentar el espíritu de equipo y a facilitar el compañerismo. Aunque solo se consideraron 19 encuestas, se puede concluir que la metodología de aprendizaje que integra MEDEAS-Encrucijada ha demostrado ser una herramienta valiosa para incluir la economía ecológica en el programa académico.

En este contexto, el ABJ ha permitido una mejor comprensión de la magnitud y las consecuencias de la crisis medioambiental; promoviendo el pensamiento reflexivo sobre los temas del curso; reconociendo la importancia del acceso y la evaluación crítica de la información y sus fuentes; y, sobre todo, la implementación de un pensamiento multidisciplinario para comprender e interiorizar mejor el vínculo entre los nuevos conocimientos adquiridos y los desafíos que afrontan en sus propias vidas. Teniendo en cuenta todo esto, la experiencia ha resultado ser muy exitosa y la metodología ABJ se utilizará nuevamente como pieza central en las futuras ediciones del curso.

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Implicación del alumnado universitario a través de un servicio de mejora de la calidad de vida de personas con discapacidad

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Abstract

The objective of this study is to analyze the impact that participation in subject articulated through the methodology named *learning and service in solidarity* has on the 3rd year students of the Degree in Pedagogy of the Faculty of Education, Philosophy and Anthropology (UPV/EHU). This methodology is deployed in the subject of *Disability and Inclusion* and commits both to the specific competences and cross-competences of the degree.

One of the best ways to acquire professional skills is to introduce students to real or near-real contexts. Participation in *Uliazpi* (Autonomous Entity of the Provincial Council of Guipúzcoa) offers students the possibility of developing their skills under academic supervision from the UPV/EHU. The subject of *Disability and Inclusion* is shaped in such a way that the process contents are dealt with by providing a service to people with serious behavioral disorders in order for them to develop a life as normal as possible, favoring their social inclusion.

The study is approached using a mixed methodology that combines quantitative and qualitative tools for collecting and analyzing information. The fieldwork consists of two moments: 1) questionnaire of 15 Likert type questions that has been constructed to obtain the opinion of the students about the degree of development of the specific and cross-competences, and 2) focus group has been carried out, after the results of the questionnaire, to deepen into those significant competences that students have detected. In this communication we will address the quantitative part of the study.

Resumen

El estudio que se presenta tiene por objetivo analizar la influencia de la participación en el programa de aprendizaje-servicio de Uliazpi (Organismo Autónomo de la Diputación Foral de Guipúzcoa) en la percepción del alumnado de 3.er curso del Grado en Pedagogía de la Facultad de Educación, Filosofía y Antropología (UPV/EHU) en relación al desarrollo de las competencias específicas de la asignatura de *Discapacidad e Inclusión* como transversales del Grado.

Una de las mejores formas de adquirir las competencias profesionales es introduciendo al alumnado en contextos reales o cercanos a la realidad. La participación en contextos Uliazpi, brinda la posibilidad al alumnado de desarrollar competencias con supervisión académica desde la UPV/EHU. La asignatura *Discapacidad e inclusión* está conformada de tal manera que los contenidos procedimentales se abordan llevando a cabo un servicio a personas con graves trastornos de comportamiento al objeto de que desarrollen una vida lo más normalizada posible favoreciendo su inclusión social.

El estudio se aborda utilizando una metodología mixta que combina herramientas cuantitativas y cualitativas de recogida y análisis de la información. El trabajo de campo consta de dos momentos: 1) cuestionario de 15 preguntas tipo Likert para recabar la opinión del alumnado sobre el grado de desarrollo de las competencias específicas de la asignatura y transversales del grado y, 2) grupo focal para ahondar en aquellas competencias con resultados más significativos desde la interpretación del alumnado. En esta comunicación abordaremos la parte cuantitativa de este estudio.

1. Introducción

Desde que se inició el proceso de Bolonia (1999), las universidades se replantearon su papel en relación al proceso de aprendizaje-enseñanza del alumnado y, propusieron enlazar los contenidos de la educación superior con las necesidades de este mundo cambiante en el que vivimos y en el que se mueve el alumnado. Todo ello derivó en plantear un sistema universitario basado en competencias donde el alumnado, para desarrollarlas, tiene que enfrentarse a situaciones complejas movilizando contenidos propios del área profesional. Es, por ello, que la inquietud e implicación del alumnado hay que asegurarla. Como reconoce el *Student engagement* el alumnado debe estar involucrado en el trabajo a pesar de los obstáculos y desafíos, y ser visible su emoción con la tarea (Kuh *et al.*, 2008; Porter, 2012; Reeve, Jang, Carrell, Jeon & Barch, 2004).

Si bien la implicación del alumnado en su propio proceso de aprendizaje es necesaria, también lo es el garantizar la colaboración de entidades que permitan que el alumnado se vaya experimentando como profesional en servicio. Esta combinación entre aprendizaje y servicio articulada en una propuesta pedagógica adecuada, ayuda al estudiantado a dotar de significatividad la propuesta académica y ofrecer sugerencias sobre las que reflexionar. Además, el hecho de unir aprendizaje y servicio produce dos tipos de resultados: mejora tanto el aprendizaje como el servicio y, produce resultados educativos en el alumnado que no son sencillos de alcanzar por otros caminos (Puig *et al.*, 2007).

2. Metodología

El estudio se aborda utilizando una metodología mixta que combina herramientas cuantitativas y cualitativas de recogida y análisis de la información. El trabajo de campo consta de dos momentos: 1) cuestionario de 15 preguntas tipo Likert para recabar la opinión del alumnado sobre el grado de desarrollo de las competencias específicas de la asignatura y transversales del grado y, 2) grupo focal para ahondar en aquellas competencias con resultados más significativos desde la interpretación del alumnado.

En este trabajo abordaremos en profundidad sólo la parte cuantitativa relativa a la participación del alumnado en el programa de *Apoyo en el Hogar para menores con Discapacidad Intelectual y/o del Desarrollo (DI/DD) y conductas problemáticas y sus familias en Gipuzkoa* de la Fundación Uliazpi. Al objeto de conocer el grado de desarrollo de las competencias del alumnado al cursar la asignatura de *Discapacidad e Inclusión* y a las competencias transversales del Grado de Pedagogía.

Respecto al programa, partimos de que las personas con discapacidad intelectual y del desarrollo necesitan apoyos y planes personales para llevar adelante sus proyectos de vida de calidad. Con frecuencia estos apoyos se proporcionan en centros especializados y, otras veces, en contextos naturales, allí donde las personas viven, juegan, aprenden o trabajan. Desde hace ya algunos años, Uliazpi (Organismo Autónomo de la Diputación Foral de Gipuzkoa), ha apostado, además del apoyo en centros y, en colaboración con la UPV/EHU, por esta vía impulsando el Programa de Apoyo en el Hogar para menores con DI/DD y conductas problemáticas y sus familias en Gipuzkoa.

En relación a las competencias específicas de la asignatura de *Discapacidad e Inclusión* que se han analizado son:

1. Analizar y diagnosticar personas, grupos, contextos e instituciones educativas con objeto de fundamentar y desarrollar la intervención pedagógica.

2. Conocer, interpretar, investigar y construir conocimiento crítico relevante en temas educativos que le permitan emitir juicios y orientaciones que incluyan la reflexión y toma de decisiones sobre temas importantes de índole científico, político, social y ético desde la perspectiva de los Derechos Humanos.
3. Diseñar, desarrollar y evaluar los procesos y programas educativos, siguiendo criterios de inclusión social, calidad y equidad, en contextos y colectivos diversos.
4. Crear condiciones para que las personas se vinculen y comuniquen de manera horizontal y empática, con objeto de ser efectivos en la inclusión social (escucha, negociación, consenso y disenso, ética...) en contextos plurilingües y multiculturales.

Las competencias transversales que se han abordado para este estudio se basan en los cinco dominios competenciales formulados en el Informe de la III Conferencia de Educación Superior de la región Asia-Pacífico de la Unesco (2016):

— Las *Habilidades interpersonales,* relacionadas con la capacidad para utilizar los conocimientos y habilidades comunicativas con la finalidad de lograr una buena interacción con otras personas. Integra competencias tales como: la comunicación, el trabajo en equipo, la colaboración, el liderazgo y la empatía.
— Las *Habilidades intrapersonales,* relacionadas con la capacidad introspectiva que permite a las personas conocer sus debilidades y potencialidades para construir una percepción precisa sobre sí mismas. Este conocimiento es utilizado para tomar decisiones adecuadas y autorregularse. Tiene que ver con competencias emocionales como: el autocontrol, la autonomía y la motivación.
— El *Pensamiento crítico e innovador*, relacionado con la capacidad de valorar de forma crítica la información o los conocimientos existentes para comprender y adaptarse a situaciones diversas. Integra competencias tales como: la reflexión, el análisis sistemático, la toma de decisiones razonada, la creatividad y el emprendizaje.
— La *Ciudadanía Global,* relacionada con la capacidad de enfrentarse a los desafíos que surgen de procesos interconectados, y que necesitan de una formación que posibilite vivir dentro de una perspectiva más amplia y global. Integra diversas competencias relacionadas con: la tolerancia, la apertura, la responsabilidad, el respeto a la diversidad, la ética, la perspectiva intercultural, la participación democrática, el respeto al medio ambiente y el sentido de pertenencia
— La *Alfabetización mediática e informacional,* relacionada con la capacidad de utilizar de forma crítica y ética las Tecnologías de la Información y la Comunicación para la gestión de la información digital y de los contenidos multimedia. Integra competencias tales como: la búsqueda, almacenamiento, transformación y compartición de la información.

A partir de estos dominios, se propone un conjunto de ocho competencias deseables para todo el alumnado de Grado y de Postgrado de la UPV/EHU recogidas en el *Catálogo de Competencias Transversales de la UPV/EHU* (Uranga *et al.*, 2019), denominadas de la siguiente manera: *Autonomía y Autorregulación*; *Compromiso Social*; Comunicación; *Ética y Responsabilidad Profesional*; *Gestión de la Información y Ciudadanía Digital; Innovación y Emprendizaje; Pensamiento Crítico*; *y Trabajo en Equipo.* Estas son las competencias que se han asumido como las competencias transversales del Grado de Pedagogía con la consiguiente adaptación al contexto de dicho Grado.

2.1. Objetivos

Los objetivos del estudio son:

— Analizar la influencia de la participación en el programa de aprendizaje-servicio de *Uliazpi* en la percepción del alumnado sobre el desarrollo de las competencias específicas de la asignatura de *Discapacidad e Inclusión*.
— Analizar la influencia de la participación en el programa de aprendizaje-servicio de Uliazpi en la percepción del alumnado sobre el desarrollo de las competencias transversales del Grado.

2.2. Muestra

La muestra que ha participado en este estudio ha sido el alumnado matriculado en la asignatura optativa de *Pedagogía Laboral*, asignatura ofertada únicamente en euskera perteneciente al módulo 6 del Grado de Pedagogía. Este módulo se sitúa en el segundo cuatrimestre del tercer curso de este Grado. En este módulo el alumnado se reparte entre las diferentes asignaturas optativas que se ofertan y el número de matriculados en las mismas no supera en muchos casos las 12 matrículas, siendo el idioma una de las variables utilizadas para la elección de la optatividad. Además, numeroso alumnado de tercer curso opta por ir a completar sus estudios en alguno de los programas de movilidad ofertados por el EEES y eso hace que se reduzca aún más el número de matrículas.

Las características de la muestra son las que se recogen en la tabla 1:

Tabla 1
Muestra

Participantes	N = 11
Identidad de género	Femenino N = 11
Idioma de matrícula	Euskera N = 11
Curso	3.er curso N = 11

3. Resultados

En relación a los resultados, lo primero que tenemos que apuntar es que éste es un estudio piloto y en ningún caso concluyente. Lo que pretendemos es iniciar una investigación longitudinal que con el tiempo nos pueda arrojar datos de la importancia de la participación en proyectos de aprendizaje-servicio para la adquisición de las competencias específicas de las asignaturas en las que se enmarcan y de las competencias transversales de la titulación en la que se sitúan.

3.1. Participación en la Fundación Uliazpi en relación a las competencias específicas de la asignatura de *Discapacidad e Inclusión*

Aunque las diferencias no sean significativas en todas las competencias de la asignatura *Discapacidad e Inclusión* analizadas, se puede apreciar en la tabla 2 que el alumnado que participa en el programa Uliazpi percibe que tiene más desarrolladas dichas competencias que el alumnado que no participa.

Tabla 2
Fundación Uliazpi y competencias asignatura Discapacidad e Inclusión

ULIAZPI		CONTEXTO	INTERVENCION	INTERPRETACION	JUICIO	PROGRAMA	CONDICION	PROPUESTAS
0	Media	3,60	3,20	3,40	3,20	2,80	3,40	3,40
	N	5	5	5	5	5	5	5
	Desviación estándar	,548	,837	,548	,837	,837	,894	,548
1	Media	3,83	3,83	4,00	3,50	3,33	3,50	3,83
	N	6	6	6	6	6	6	6
	Desviación estándar	,408	,753	,632	,837	,816	,837	,753
Total	Media	3,73	3,55	3,73	3,36	3,09	3,45	3,64
	N	11	11	11	11	11	11	11
	Desviación estándar	,467	,820	,647	,809	,831	,820	,674

3.2. Participación en la Fundación Uliazpi en relación a las competencias transversales del Grado de pedagogía

Cuando analizamos la relación entre la participación en el programa de Uliazpi con las competencias transversales de la titulación, aparecen resultados significativos en algunas de ellas: comunicación, autonomía y autorregulación, pensamiento crítico, innovación y emprendizaje y, por último, compromiso social.

A continuación expondremos los resultados de las competencias transversales en las que aparecen ítems con significatividad.

a) *Comunicación*

Cuando analizamos la competencia comunicativa vemos que el alumnado que participa en el programa Uliazpi tiene una percepción más alta en casi todas los items que el alumnado que no participa, a excepción del ítem referente a la incorporación en el discurso de las recomendaciones para el uso inclusivo del Euskera y del Castellano y la perspectiva de género en la que la diferencia es mínima (véase tabla 3).

Tabla 3
Uliazpi y comunicación

ULIAZPI		ESTRUCTURAS	NORMAS	ESCUCHA	COMUNICAR	EXPRESAR	EXPRESIONVYNV	EXPOSICION	RESPETO	INTERACCION	ASERTIVIDAD	EUSKERAYGENERO
0	Media	3,20	2,60	3,40	3,40	3,80	3,40	3,60	3,60	3,60	3,00	3,60
	N	5	5	5	5	5	5	5	5	5	5	5
	Desviación estándar	,837	,548	,548	,548	,447	,894	,548	,894	,548	,000	,548
1	Media	3,33	3,33	4,67	4,00	4,00	3,67	3,67	4,17	3,83	3,33	3,50
	N	6	6	6	6	6	6	6	6	6	6	6
	Desviación estándar	,816	1,211	,516	,632	,894	,816	1,033	,408	,408	,516	,548
Total	Media	3,27	3,00	4,09	3,73	3,91	3,55	3,64	3,91	3,73	3,18	3,55
	N	11	11	11	11	11	11	11	11	11	11	11
	Desviación estándar	,786	1,000	,831	,647	,701	,820	,809	,701	,467	,405	,522

Analizando mediante el Análisis de Varianza ANOVA la significatividad de los resultados, vemos que hay significatividad (Sig = 0,003) en el ítem de *mantener la escucha activa en grupos de trabajo diversos con empatía y asertividad.* Este resultado puede ser debido a la importancia que se da desde los seminarios de seguimiento semanales a que analicen la información recogida de manera objetiva y que no se hagan juicios de valor en las relaciones con los familiares de los usuarios que participan en el servicio. Todo ha de ser analizado desde la empatía, la escucha activa y, comunicado con asertividad. Es uno de los ejes que se trabajan en el programa.

b) *Autonomía y autorregulación*

Respecto a esta competencia el análisis de las medias muestra que en la mayor parte de los ítems, al igual que en comunicación, el alumnado participante en Uliazpi se percibe con mayor competencia que el alumnado que no participa (véase tabla 4).

Tabla 4

Uliazpi y Autonomía y Autorregulación

ULIAZPI		MOTIVACION	ESTRATEGIAS	AUTONOMIA	FORTALEZAS	ESFUERZO	RESPONSABILIDAD	ARGUMENTACION	ACTUACION	EMOCION	PREVIA	RACIONALIDAD	CRITICA	APRENDIZAJE
0	Media	3,80	3,00	3,00	4,00	3,80	3,80	3,40	2,80	3,40	4,00	3,20	3,80	3,80
	N	5	5	5	5	5	5	5	5	5	5	5	5	5
	Desviación estándar	,447	,707	,000	,000	,447	,447	,548	,447	,548	,000	,447	,447	,447
1	Media	3,50	3,67	3,50	3,50	3,83	3,83	4,00	4,00	3,83	4,17	3,83	4,17	4,00
	N	6	6	6	6	6	6	6	6	6	6	6	6	6
	Desviación estándar	1,049	,516	,548	1,049	,753	,983	,632	,632	,753	,983	,753	,753	,632
Total	Media	3,64	3,36	3,27	3,73	3,82	3,82	3,73	3,45	3,64	4,09	3,55	4,00	3,91
	N	11	11	11	11	11	11	11	11	11	11	11	11	11
	Desviación estándar	,809	,674	,467	,786	,603	,751	,647	,820	,674	,701	,688	,632	,539

Para esta competencia se ha hallado significatividad (Sig = 0,006), mediante ANOVA, en las respuestas del alumnado participante en el programa Uliazpi en lo referente al siguiente ítem: *Modificar de manera positiva las propias actuaciones como resultado de un proceso de contraste con experiencias y aprendizajes ajenos*. Casualmente este es uno de los objetivos de los seminarios de seguimiento semanales que se realizan en la Facultad. Esto es lo que les ayuda a aprender de forma significativa, mediante el contraste que obtienen de la propia práctica.

c) *Innovación y emprendizaje*

Respecto a esta competencia el análisis de las medias muestra que en la mayor parte de los ítems, al igual que en las anteriores, el alumnado participante en Uliazpi se percibe con mayor competencia que el alumnado que no lo hace (véase tabla 5).

Tabla 5
Uliazpi y Innovación y emprendizaje

ULIAZPI		MEJORA	OPORTUNIDAD	INNOVACION	ACTICUDCONST	EXPECTATIVA	INTERVENCION	EMERGENTE	PLAN	EMPRENDER	INCERTIDUMBRE	LIDERAZGO
0	Media	3,00	3,20	3,20	3,80	3,00	3,00	3,20	3,20	3,00	3,20	3,00
	N	5	5	5	5	5	5	5	5	5	5	5
	Desviación estándar	,707	,837	,837	,447	,707	1,000	,447	,447	,707	,447	,707
1	Media	3,83	3,83	3,33	3,67	3,50	3,33	3,50	4,00	3,50	3,50	3,17
	N	6	6	6	6	6	6	6	6	6	6	6
	Desviación estándar	,753	,753	1,033	,516	,548	,816	,548	,632	,837	,837	,753
Total	Media	3,45	3,55	3,27	3,73	3,27	3,18	3,36	3,64	3,27	3,36	3,09
	N	11	11	11	11	11	11	11	11	11	11	11
	Desviación estándar	,820	,820	,905	,467	,647	,874	,505	,674	,786	,674	,701

Para esta competencia se ha hallado significatividad (Sig = 0,042), mediante ANOVA, en las respuestas del alumnado participante en el programa Uliazpi en lo referente al siguiente ítem: *Poner en marcha acciones para dar respuesta a necesidades y mejoras concretas, siguiendo mi plan de trabajo.* La elaboración de planes de trabajo se plantea semanalmente en el seminario de seguimiento para después ponerla en práctica en el contexto natural del usuario de Uliazpi con problemas conductuales. La siguiente semana se vuelve a traer al seminario para analizar cómo ha ido dicha práctica y así poder volver a elaborar un nuevo plan de trabajo.

d) *Pensamiento crítico*

Respecto a esta competencia el análisis de las medias muestra que en la mayor parte de los ítems, al igual que en las anteriores, el alumnado participante en Uliazpi se percibe con mayor competencia que el alumnado que no participa (véase tabla 6).

Tabla 6
Uliazpi y Pensamiento crítico

ULIAZPI		PCOBSERVACION	PCIDENTIPROBLE	PCHIPOTESIS	PCSINTESIS	PCINTERPRETACION	PCCUESTION	PCSOLUCION	PCPROCESO	PCPLAN	PCRESOLUCION	PCCONTRASTE	PCCONCLUSION	PCINTERDISCIPLINAR
0	Media	3,40	3,20	3,00	3,00	2,60	3,40	3,60	3,20	2,60	2,80	3,20	3,20	3,20
	N	5	5	5	5	5	5	5	5	5	5	5	5	5
	Desviación estándar	,548	,447	,000	,707	,548	,548	,548	,447	,894	,837	,447	,837	,837
1	Media	3,17	3,67	3,50	3,00	3,50	3,67	3,83	3,67	3,83	3,83	4,00	3,67	3,50
	N	6	6	6	6	6	6	6	6	6	6	6	6	6
	Desviación estándar	,408	,516	,837	,894	,548	,816	,753	,516	,983	,753	,894	,516	,837
Total	Media	3,27	3,45	3,27	3,00	3,09	3,55	3,73	3,45	3,27	3,36	3,64	3,45	3,36
	N	11	11	11	11	11	11	11	11	11	11	11	11	11
	Desviación estándar	,467	,522	,647	,775	,701	,688	,647	,522	1,104	,924	,809	,688	,809

Para esta competencia se ha hallado significatividad (Sig = 0,024), mediante ANOVA, en las respuestas del alumnado participante en el programa Uliazpi en lo referente al siguiente ítem: *Interpretar la información obtenida de diferentes fuentes valorando desde una perspectiva crítica la pertinencia y el alcance de la misma*. Este es un aspecto que trabajamos en el seminario en numerosas ocasiones para que cuando el alumnado está con la familia sepa interpretar la realidad de la forma más objetiva posible y no dejándose influenciar ni posicionándose a favor o en contra de nadie en el contexto familiar. El contexto familiar es complejo y el/la estudiante tiene que actuar con la mayor profesionalidad posible.

e) *Compromiso social*

Respecto a esta competencia el análisis de las medias muestra que en la mayor parte de los ítems, al igual que en las anteriores, el alumnado participante en Uliazpi se percibe con mayor competencia que el alumnado que no lo hace (véase tabla 7).

Tabla 7
Uliazpi y Compromiso social

ULIAZPI		DESIGUALDAD	DIVERSIDAD	VIASSUPERACION	GESTIONRECURSOS	IGUALDADGENERO	IMPACTOMEDIO	POLITICA	JUICIOSOCIAL	INTERDISCIPLINAR	DESARROLLOSOST
0	Media	3,80	3,40	3,60	3,20	3,20	2,60	3,00	3,40	2,60	3,00
	N	5	5	5	5	5	5	5	5	5	5
	Desviación estándar	,447	,548	,548	,447	,837	,548	,707	,548	,548	,000
1	Media	4,00	4,17	3,67	3,67	3,83	3,50	3,00	3,50	3,17	3,17
	N	6	6	6	6	6	6	6	6	6	6
	Desviación estándar	,894	,753	,816	,516	,753	,548	,632	,548	,753	,753
Total	Media	3,91	3,82	3,64	3,45	3,55	3,09	3,00	3,45	2,91	3,09
	N	11	11	11	11	11	11	11	11	11	11
	Desviación estándar	,701	,751	,674	,522	,820	,701	,632	,522	,701	,539

Para esta competencia se ha hallado significatividad (Sig = 0,024), mediante ANOVA, en las respuestas del alumnado participante en el programa Uliazpi en lo referente al siguiente ítem: *Analizar el impacto social y medioambiental de las acciones científico-técnicas y de las decisiones y propuestas profesionales*. En realidad de este ítem trabajamos sobre todo el impacto social de las acciones que el alumnado realiza con el caso que supervisa para mejorar las propuestas profesiones que realiza.

4. Conclusiones

Si aunáramos todos los ítems con significatividad extraídos del cuestionario podríamos tener una aproximación del trabajo que se realiza dentro del programa Uliazpi, ya sea dentro de los seminarios de seguimiento como en el contexto natural donde se inserta el alumnado para ofertar el servicio:

- *Mantener la escucha activa en grupos de trabajo diversos con empatía y asertividad. (Seminario)*
- *Modificar de manera positiva las propias actuaciones como resultado de un proceso de contraste con experiencias y aprendizajes ajenos. (Seminario y contexto natural)*
- *Poner en marcha acciones para dar respuesta a necesidades y mejoras concretas, siguiendo mi plan de trabajo. (Contexto natural)*
- *Interpretar la información obtenida de diferentes fuentes valorando desde una perspectiva crítica la pertinencia y el alcance de la misma. (Contexto natural y Seminario)*

— *Analizar el impacto social y medioambiental de las acciones científico-técnicas y de las decisiones y propuestas profesionales. (Seminario)*

La conclusión a la que llegamos con esta investigación incipiente es que la participación del alumnado en el programa Uliazpi influye en el desarrollo de las competencias específicas de la asignatura de *Discapacidad e Inclusión* del Grado de Pedagogía, pero sobre todo en el desarrollo de las competencias transversales de la titulación.

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Working with students as our partners to improve student engagement

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Abstract

Sometimes the term 'student engagement' can inadvertently be considered something that is done to or for students and can be focused too much on outcomes (see for example Matthews 2016). Consequently, in a School of Strategy and Leadership within a UK University Business School, we are starting to focus more on the relational process of engaging with our students via various 'Students as Partners' type initiatives. We believe that this approach also enables the development of strong relationships with our students built on mutual trust and respect which we see as being particularly important at a time when the student population is becoming ever more diverse (albeit not always particularly well integrated). As such working with our student partners we have over the last 18 months delivered a number of 'Students as Partners' activities which will be discussed in this paper. These include the roll out of a student buddy scheme for new first year undergraduate students, a number of student projects where students themselves have undertaken 'SOTL' related research with the aim of improving Student Experience, a staff - student forum on improving student engagement on our largest undergraduate course as well as a 'best practice' workshop in which staff worked alongside students to consider new ways to work on partnership activities within the School. Additionally, we have recently launched student led practice presentation workshops delivered as part of an assessed module, and will shortly be rolling out of a School wide Student Ideas Scheme. This Paper will provide an overview of each of these initiatives including some practical advice on developing Students as Partners activities from scratch, together with a discussion of some of the main benefits we have seen for both students and staff arising from the roll out of these initiatives. The paper will also discuss the main challenges we have faced and our plans to overcome those challenges.

1. Introduction

This paper discusses an on-going Project in a School of Strategy and Leadership in a UK University Business School, to work with students as our partners in order to improve student engagement within the School. In doing so, we wish to move away from more typical strategies to increase 'student engagement' which can too easily become things that are done *to or for* students and instead focus on the relational process of engaging *with* students through partnership activities (see Matthews 2016).

According to Cook-Sather *et al.* (2018:1) "The term [Students as Partners] aims to capture an aspiration for working together in higher education in a way that rejects traditional hierarchies and assumptions about expertise and responsibility". Healey and Healey (2018) make the point that Students as Partners (SaP) is a difficult topic on which to generalise as partnership activities take place in many different contexts. However, this project has endeavoured to follow the approach of Cook-Sather, Bovill and Felten (2014:6-7), who suggest that SaP should be "a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision making, implementation, investigation, or analysis." They also stress that underpinning SaP activities should be a set of partnership values which they identify as respect, shared responsibility, and reciprocity.

We have also focussed on creating opportunities for initiatives that sit towards the higher end of Bovill and Bulley's Ladder of student participation in curriculum design (2011: 176-188) adapted from Arnstein (1969) in order to arrive at a point where students have substantial influence over their own learning. We have taken an incremental approach to this by building on a series of pilot initiatives to develop momentum. This 'start small' approach is also recommended by Cook-Sather, Bovill and Felten and reflects the realities of resource and time constraints.

2. Methods

We looked at a range of useful SaP resources (see for example Healey 2019 and Cook-Sather, Bovill and Felten 2014) at the outset of this Project to draw up a list of priority activities. Our focus was to identify those activities that could be piloted within relatively short time scales and had the potential to be rolled out to include larger numbers of students in the future. These activities are discussed below.

2.1. Student Buddy Pilot Scheme

We started with a student buddy scheme because it would be relatively straightforward to implement and had the potential to bring immediate benefits to new students. We also believed that current students might welcome the responsibility of supporting new students at the start of their course.

The scheme was initially piloted in 2017, by asking second year students on our largest undergraduate course, if they would be interested in volunteering to become a student buddy to support incoming students in the course's January entry cohort which comprised of approximately 60 new students. We did not set any selection criteria as we wanted to encourage a diverse range of students to become buddies. The main requirements of the role, which were overviewed during a mandatory training session, were for the buddies to provide the new students with practical information about the university and student life and signpost them to appropriate support available. The buddies were also asked to attend a welcome meeting for the new students and then meet up occasionally with their assigned student(s) in their first semester to check that they were settling in OK. (The requirements of the role were kept deliberately 'light touch' to avoid it being overly burdensome).

In total eight students volunteered to become buddies and 10 of the new students signed up to be buddied (the new students' participation was obviously optional). Following this pilot, the buddy scheme was rolled out across each of our 3 main undergraduate courses the following September. To date a total of 35 students across these 3 courses have become buddies.

Although the buddy role is voluntary, we have been able to award 'credit' to the participating students. This is in the form of Continuing Professional Development (CPD) points which all students on each of our 3 main undergraduate courses are required to collect, in order to pass their mandatory CPD module (a form of 'careers' module taken at each level of study). CPD points are awarded for participating in CPD related activities as these should contribute to students' employability credentials. Additionally, after successfully completing their role, the buddies are provided with a certificate recognizing their contribution.

2.2. Educational Research Undertaken By Students As Part Of Their Assessed Coursework

This initiative has consisted of students working in small groups to undertake a research project investigating improvements that can be made to the current practises of the school which have a bearing on student experience and student outcomes. For example, students working on these projects have looked at how the school could better integrate research into teaching and learning and how the school could best support undergraduates to improve their prospects of obtaining a graduate job. This work has been undertaken as part of an optional second year work-based project module whereby for their Module assessment, students work on a project for a client organisation (the client in this case being the University itself). The students also present their findings and resultant recommendations to the School's Management team. Since the module was launched in 2017 more than 60 students have worked on these internal projects.

2.3. Students as Partners Best Practice Workshop

'Best practice' workshops on various aspects of Teaching, Learning and Assessment are organised monthly for the School's academic staff. A session was arranged on SaP, however on this occasion, students who had taken part in our SaP activities were also invited. In total 7 students accepted the invitation and worked alongside staff to identify potential initiatives that could be delivered within a SaP framework. The participating students were again awarded CPD points in recognition of their contribution. Several ideas emerged as a result of this session – including a student-staff discussion panel on student engagement as discussed below.

2.4. Student - Staff Discussion Panel On Student Engagement

The rationale behind this discussion panel, was to explore ways the School could help facilitate greater levels of student engagement. The focus was on our largest undergraduate course which has a student intake of over 300 new students per year. All students on the course were invited to attend, although unfortunately only 2 students did so. Nevertheless, the resultant discussion between the Course Management Team and the students who did attend, was very positive with some interesting ideas generated. These ideas were summarised in a document co-authored by the staff and students attending which was then forwarded to the Faculty's Student Voice Working Group for further consideration. The remit of the Working Group is to consider Faculty wide initiatives to improve student engagement and ensure that the student voice is heard. It is chaired by the Associate Dean for Student Experience and comprises both staff and student representatives.

2.5. Student Led Presentation Practice Workshops

This is a new initiative that has been piloted in 2019. It arose from a first-year student's request for the School to facilitate student led presentation practice workshops as the student felt that he and his peers would benefit from delivering 'practice' presentations to their fellow students in a 'safe' environment. We were happy to accommodate this and suggested that the workshops could be delivered as an optional CPD module activity as this would

enable the student participants to collect CPD points. The workshop format was then jointly developed by the student who had suggested the idea and the module leader of the CPD Module. Whilst student led, a staff member is also present at each session just in case any issues arise that the student leader might need support to deal with. The two sessions to date have both had full attendance (albeit restricted to 8 students per workshop - to ensure that all students have time to present and receive feedback). Informal feedback on these sessions has been very positive both from the student participants and the staff who were in attendance. A disappointment though has been that only one student (the student who suggested the idea in the first place) has volunteered to lead the workshops.

2.6. Planned Activities For The New Academic Year

School Student Ideas Forum

Given that a relatively small number of students have participated in the previous SaP activities discussed above, we wanted to create a medium through which all students in the School are given the opportunity to share ideas for potential School enhancements. With this mind, we are in the process of setting up an online School Student Ideas forum (via our online learning platform) whereby all students will be able to share their ideas. This could be anything from ideas around Teaching, Learning and Assessment methods, or ideas for new courses, to additional resources that would support learning or suggested locations for future field trips. All ideas will be welcome as long as the focus is on *future* enhancements (complaints about existing courses and modules can already be aired through other communication channels – for example Module and Course Evaluation Questionnaires or via Student Reps).

We are also trying to make the forum very 'user friendly' so that students will need only to submit a simple form with the basic details of their idea. Each idea submitted will then be made available on the forum for 4 weeks, so all other students will have the chance to see and comment on it. Thereafter, the School's Management team will announce what subsequent action they will take and their rationale for this. As an additional incentive to encourage students to participate, we hope to be able to award a £50 Amazon gift voucher for the best idea submitted in each academic year.

Second Student - Staff Discussion Panel on Student Engagement

We would like to hold a second student-staff discussion panel on student engagement. There is obviously a clear need however to encourage greater numbers of students to take part and so we will be asking the Student Union to jointly publicise and potentially co-host / facilitate this next event which we are hoping to arrange for early in the new academic year.

3. Reflections

We have not yet had the opportunity to collect any primary data from the students and staff participants in the above activities and indeed conducting this research will be an important next step for the project. Nevertheless, the anecdotal evidence we have seen to date from participants has been positive and generally in line with previous research findings (see Mercer-Mapstone *et al.,* 2017) as discussed below.

3.1. Benefits

Mercer-Mapstone *et al.* (2017) undertook a systematic literature review of empirical SaP research and found that the mostly commonly reported positive outcomes for students of SaP activities included increased engagement, motivation and ownership of learning, increased understanding of the 'other's' experience (i.e. seeing things from the teacher's perspective), improved relationships with staff, increased awareness of employability skills and attributes and an increased sense of belonging. The informal feedback we have received from our student participants to date, has also tended to mirror these findings. It could also be argued that the SaP activities we have piloted have helped build stronger relationships between the participating students and staff as these activities have given students the opportunity to see and meet with their teachers outside of the normal classroom environment.

Our anecdotal evidence to date also seems to suggest that an increased sense of collegiality has arisen from these activities. For example, we have had students that were buddied as new students going on to becoming buddies themselves and students that have wanted to continue buddying once their original term of being a buddy has ended, because they have enjoyed the experience and want to continue to support new students and make new friends in the process.

One area that we cannot yet be confident about though is whether our student participants would report feeling more motivated or engaged as a result of taking part in these initiatives. This is because these students have tended to be very engaged and highly motivated students anyway.

In terms of benefits for staff, Mercer-Mapstone *et al.* (2017) found that the most commonly reported positive outcomes included improved relationships with students, enhanced teaching / teaching materials and the ability to see things more clearly from the perspective of their students. These findings also chime with anecdotal comments by staff who have taken part in this project's activities. Indeed, the opportunity to develop a better understanding and appreciation of issues faced by today's students —through for example the discussion panel on student engagement— has been particularly valued.

3.2. Drawbacks

The major negative outcomes (fewer in number and nearly all relating to students) as reported on by Mercer-Mapstone *et al.* (2017) are worsened relationships and student disillusionment where partnership activities do not result in change to the status quo. Additionally, in these circumstances, pre-existing power inequalities between teachers and students are confirmed from the student's perspective with a resultant decrease in student engagement and motivation.

There have not yet been any cases of our students informally mentioning the above types of negative outcomes however this cannot be properly assessed until we undertake formal research. We have though recognized that we do need to put in place appropriate mechanisms so that any resultant action (or non-action) arising from future SaP initiatives can be properly communicated to students. This is why we plan to ensure that all ideas submitted to the School Ideas Forum, as discussed above, will be responded to by the School's Management team including the action that will be taken as a result.

3.3. Challenges and Learning Points

The main disappointment we have experienced so far has been the relatively small number of students that have been involved and indeed the students that have participated have tended to be students that are already very engaged as discussed above. Bell (2016) and Felten *et al.* (2013) report similar issues with SaP activities, whilst Bovill (2017) suggests that depending on the context, full participation across the student body may not be possible or even desirable. Nevertheless, we would still like to find ways to reach out to students who do not normally take part in these initiatives as those are the students who could potentially benefit the most from participating.

There is also the nagging doubt that we could inadvertently be using SaP activities as a tool to 'evidence' examples of student engagement without fully embracing the partnership ethos. Indeed, there is an argument that SaP terminology can be misappropriated by University leaders to pay lip service to improving student satisfaction whilst doing nothing to disrupt existing power structures (Matthews 2017, Matthews *et al.* 2018). On reflection, and with the benefit of hindsight, it would have definitely been better to have invited students to join in the process of identifying priority areas for our SaP activities at the outset of the Project (an approach recently advocated by Mercer-Mapstone and Marie 2019) and this is certainly something that we now intend to address as discussed below.

4. Next Steps

We have not yet collected any primary research data and so do not yet have formal results to report. We now plan to undertake that research with both student and staff participants. Additionally, we want to undertake research to find out why the vast majority of students have not chosen to participate as this is currently a rather overlooked area of SaP research (Marquis *et al.*, 2018) plus it should develop our understanding of approaches we can take to increase student participation in the future.

We also intend to invite students to work alongside staff in a SaP 'strategy' team to jointly develop our future approach to SaP as we recognise this has been lacking up until now.

Additionally, there have not yet been any SaP activities that have involved postgraduate students. This is partly because postgraduate students are here for only a year as opposed to 3 or 4 years in the case of undergraduates, but we nevertheless want to explore ways that we can involve postgraduates in future activities.

We will also be giving further consideration to how we can best reward students for their contribution to partnership activities. This is important (see Ahmad *et al.*, 2017) as it doesn't seem equitable to ask students to donate their time and effort for nothing in return. We have at least been able to offer CPD points to our previous student participants, however, if we want to extend SaP to additional cohorts (including postgraduates) then we will need to find other ways to reward them —if as things stand— we are not able to offer any financial rewards.

Finally, we plan to seek out opportunities to collaborate on SaP activities with colleagues and students in other faculties to ensure that this important work builds up University wide momentum. In the meantime, we will continue to look at examples of best practise in other instructions both in the UK and internationally and focus on considering how we can adapt newly emerging initiatives within our own School.

5. Conclusions

This paper has highlighted the rationale for our focus on SaP initiatives and has provided an overview of the initiatives we have taken to date as well as those that are still in development. An important next step for the Project will be to undertake primary research with both students that have participated in SaP activities and those that have chosen not to. We also intend to invite students to co-create our future SAP strategy as well as reaching out to colleagues and students in other faculties to look for opportunities for collaboration.

It feels like we have only started to scratch the surface of this important activity and are keen to find new ways to extend its reach and impact.

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Electronic and audio feedback: student engagement and perception

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Abstract

This paper presents the results of a pilot project on the use of electronic and audio feedback, exploring student engagement and perceptions. The purpose of the project was to find a way to encourage and motivate students to engage with the feedback process; to change from a culture of students focusing on their final numerical grades to a culture where students engage with and process their feedback. This encourages students to become agents who can self-evaluate and assess their own academic work. The ongoing project also seeks to explore how students internalise feedback, the emotional impact of receiving feedback and how audio feedback can be used to regulate and take the emotion out of giving and receiving feedback. This paper presents data that was collected in 2017/2018; however, the presentation will also include data collected during 2018/2019, and concludes with a reflection on the use of electronic and audio feedback from a lecturer perspective. A major finding is that the students did access and engage with the feedback and identified benefits to their learning.

1. Introduction

Education has become a lifelong process and many students are now coming to higher education at different junctures in their lives. The students in our classrooms come from a diverse range of backgrounds and many have had very different educational experience. These factors influence how a student may engage in the classroom, their approach to learning and how they process feedback. Evaluating and assessing student course work is a fundamental and universal responsibility of lecturers. This process of providing and receiving feedback can be an emotionally charged experience for both the lecturer and the student alike. The marketisation of higher education has resulted in students becoming increasingly assertive consumers of education with increased expectation of individualised, personal attention and grades (Martínez-Arboleda, 2018). The evaluation efforts of the lecturer, that is the grades they assign, have important and often lifelong consequences for the student, the education system and society (Brackett *et al.*, 2013).

This small-scale innovation of practice and related research began during the academic year 2017/2018 as part of project referred to as SPEEDS (Social Policy Education Enhancing Digital Skills), a collaboration between Social Policy educators, students, and educational technologists across several Institutes of Technologies and Universities in the Republic of Ireland. The purpose of the collaboration was to transform personal and professional digital capacities in a teaching and learning context. This research continues to be a work in progress, with plans to develop and extend it further as part of a thesis on a master's degree in Teaching and Learning. This will include surveys with future cohorts plus qualitative approaches such as interview/focus groups.

2. Literature review

According to McCarthy (2015, p. 153) assessment and feedback is central to student learning in higher education and effective feedback is essential "as the scaffolding that enhances learning". He stresses that despite current literature outlining the importance of high quality and timely feedback, there are many obstacles to the delivery of such feedback. One of the major obstacles is engaging students in the assessment feedback process. Students often find that the feedback they receive is, too late, too vague and unclear due to illegible handwriting. This results in the students misunderstanding the feedback and or failing to engage with it and as a result many simply ignore the feedback provided (ibid, 2015). This is in direct contrast to audio feedback where research by Lunt and Curran (2010) found that students were ten times more likely to download an audio file online than collect their written feedback. Emery and Atkinson (2009) suggest that one minute of audio feedback is the equivalent of 100 written words of feedback and as a result audio feedback gives lecturers a platform to provide a comprehensive and sensitive approach to providing feedback.

Research conducted by Ice *et al.* (2007) found that students perceive audio feedback as more supportive and caring than the more traditional approach of written feedback, reporting a greater understanding of the feedback. Further research conducted by Merry and Osmond (2007), King *et al.* (2008), and Hennessy and Foster (2014) also found this to be the case. In addition, Northcliffe and Middleton (2008) indicate that the tone and expression of the lecturer providing the feedback both to the depth of communication between the lecturer and the student. Simply referring to students by their name during feedback facilitates a deeper connection between the student and the lecturer (Ice *et al.*, 2007).

The relationship and social interactions between the lecturer and the student has power at its core. Värlander (2008) argues, that as a result, giving and receiving feedback can often awake emotions such as pride or shame as well as guilt and anxiety in one or both parties. Students' emotions greatly influence the way in which they can receive and process feedback. Feedback can influence how a students' feel about their about their academic ability (positively and negatively) and what and how they can learn (Dweck, 1999), and sometimes the value of the feedback may be 'eclipsed by learner's reactions' to it (Race, 1995 as cited in Värlander, 2008, p. 145). Therefore, Voelkel and Mello (2014) indicate that it's easier for students to hear critical feedback than to read it.

Sadler (2013) argues that the role of the lecturer is not to critique and offer advise on how to improve but rather it is to teach students how to assess the quality of their work and modify it as they do it. To do this students must be taught to develop the ability to evaluate and judge their own work, so they can identify and distinguish between what is unacceptable, satisfactory, good, very good and excellent pieces of work. Clear and comprehensive feedback is one of the key pedagogical approaches which can be remodelled to support students in developing "evaluative judgement" (Joughin, *et al.*, 2018).

3. Overview of the Project

3.1. Aim of the Project

This research project seeks to evaluate the use of electronic and audio feedback as a means of enhancing the formative assessment process for students, and a mechanism for managing emotions within the feedback loop for both the lecturer and student.

3.2. Project Objectives

— To explore the extent of student engagement with audio and electronic feedback.
— To investigate students' perception of audio and electronic feedback as a feedback medium.
— To explore the emotions students and lecturers associate with feedback (ongoing).

3.3. Rationale for this Project

Over the years I found that despite the fact, I had spent hours grading and providing feedback on assignments many students failed to attend for feedback. Those who did attend appeared to have difficulty fully understanding the feedback. I felt that several factors may have contributed to this such as illegible handwriting, lack of detail and/or the short period of time they had to review the feedback in class. I observed a significant number of students submitting assignments year in year out with many of the same errors, and many saw little or no improvement in their grade from one assignment to the next. On some occasions when students did attend for feedback, a small minority of students became emotional (upset, disappointment and/or anger) and this appeared to impede their ability to take the feedback on board. Sometimes this impacted on me emotionally and as a result this had the potential to influence my objectiveness when grading their future assignments. Therefore, I was looking for a way to encourage students to become involved in the feedback process, and to take ownership and responsibility for their own learning. I also wished to take some of the emotion out of the feedback process both for the student and for myself as the lecturer.

My current teaching includes year 1, year 2 and year 4 on the Applied Social Care Degree, students may exit at year 3 with a Level 7 degree or Year 4 with a Level 8 degree. I also teach a module on the MA in Child, Youth and Family. During the academic year 2017/2018 I decided to pilot electronic grading and audio feedback with year 1, with year 4 and with the MA students. I chose the year 1 as I have a very large number of students in the class (over 100) and I wanted to see if grading assignments electronically and providing the audio feedback would be time efficient or more time consuming than my traditional method of marking and providing feedback. I also found that year 1 students require more in-depth feedback. I wanted my students to become engaged in the feedback process from the outset of their higher education and for them to see the value of feedback. I wanted to encourage them to place greater emphasis on the feedback rather than the grade value. I chose year 4 as they have had three years of receiving feedback in a more traditional manner and therefore, they were best placed to provide me with a comparative overview of their experience of receiving traditional feedback versus the electronic and audio feedback. Finally, I chose the MA students as this is the smallest cohort of students I teach (six to eight students on average each year) and I wanted to give them an opportunity to submit a draft piece of work, receive detailed formative feedback and then submit the final submission. By assessing their work electronically, giving the audio feedback on the draft piece, and then getting the students to submit their final submission having had the benefit of the electronic and audio feedback, I could measure if the students had engaged with the feedback and implemented it into their final submission.

4. Research Methods

In the academic year 2017/2018, I began using electronic and audio feedback using the tool Turnitin Feedback Studio. To gauge student feedback, students were invited to

participate in an anonymous online survey. The survey questions consisted of a combination of quantitative (closed questions, Likert scale) and qualitative (open) questions. The survey was made available to 1st and 4th year students through a link in the virtual learning environment (VLE) in April 2018. Over 12-day period 55 students responded. As this is an ongoing piece of research a revised survey was also completed by year 1, year 4 and master's students during the academic year 2018/2019 – these new findings will be presented and discussed during the oral presentation that accompanies this paper. Further research is planned, including focus groups and interviews to delve deeper into the emotions associated with feedback.

Description of the feedback approach used:

1. Students are fully briefed on the assignment and on the feedback process before doing their assignments. This included a demonstration on how to access the electronic and audio feedback.
2. Student uploads their work to the Turnitin portal of the VLE.
3. Lecturer logs onto the VLE, views the students' work, creates a suite of reusable feedback comments which can be inserted through each student's work as required.
4. For each student, the lecturer records up to three minutes of detailed formative feedback. This feedback, based on the assessment criteria, signposts elements of good work, indicates what improvements need to be made, and suggest how these can be made in order to improve and enhance their work.
5. Once all the student assignments have been graded, a VLE announcement is made that the work has been marked and that students can now access the audio and electronic feedback.
6. One week later the numerical grade is made available to each student. This delay allows the student an opportunity to read, review and process the feedback rather than focusing exclusively on the numerical grade.

5. Student Feedback

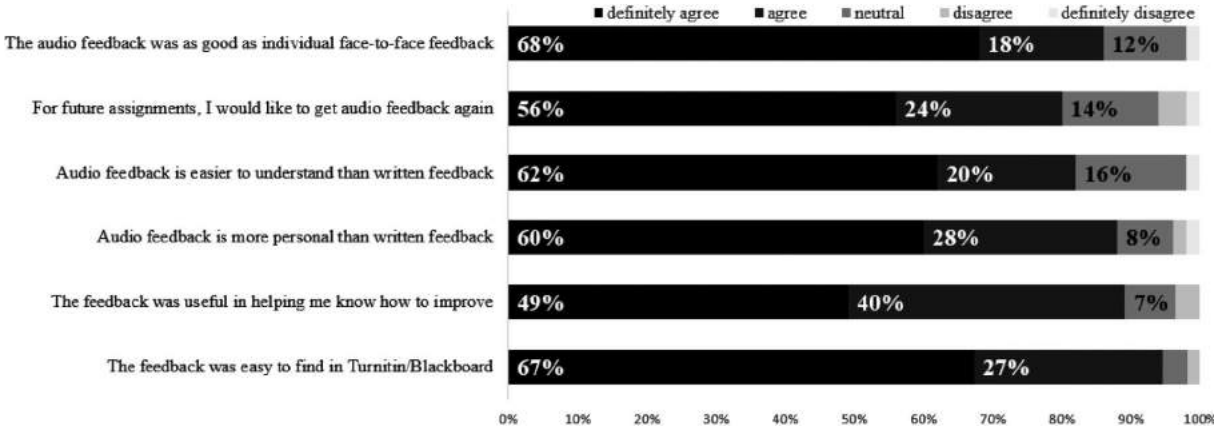
5.1. Extent of student engagement with the audio feedback

Fifty-five students responded to the survey. Only three respondents indicated that they had not engaged with the electronic and audio feedback. Of these, one indicated they had not received any audio feedback (this was noted and during 2018/2019 all students were advised to contact me immediately if they did not receive audio feedback or if there were any technical glitches etc.). One student provided no further detail as to why they did not engage in the process. However, the third students' response was very interesting as this student separately self-identified to me and outlined that they did not engage with or like the audio feedback. When I probed the student on this issue, they outlined that they would have preferred an opportunity to meet with me (the lecturer) to discuss the feedback. The student indicated that they had been disappointed and angry with the grade they received (it did transpire that they had read and listened to the feedback, and they did understand the feedback) and that they wanted to vent their anger and frustration. This was of significance as it indicates that the electronic and audio feedback can play a role in the management of emotions for both the student and the lecturer, and in this instance acted as a useful buffer between the student and the lecturer.

5.2. Student perceptions of electronic and audio feedback

Fig. 1., provides an overview of students' perceptions and evaluation of electronic and audio feedback, 89% (n=55) indicated that they found the feedback was useful in helping them know how to improve on future assignment, with 49% definitely agreeing. The vast majority, 95% (n=55), found the feedback easy to find in Turnitin/VLE (67% definitely agree). Specifically related to audio feedback, 86% (n=50) indicated that they found the audio feedback to be as good as an individual face-to-face feedback session with their lecturer, with 68% definitely agreeing. 80% (n=50) indicated that they would like to receive this method of feedback again (56% definitely agree). 82% (n=50) indicated that the audio feedback was easier to understand than the written feedback (62% definitely agree). 88% (n=50) felt it was more personal than written feedback (60% definitely agree).

Figure 1
Student evaluation of audio feedback



As part of the survey students were asked to answer several open questions in a bid to ascertain their perceptions of the electronic and audio feedback. The students were very positive in their responses and highlighted what they perceived to be the benefits of receiving feedback in this way. Students particularly liked that the feedback was specific to them.

> "Audio feedback is highly beneficial and allows students to feel more satisfied in understanding what they need to work on to improve in the future and why they got the given mark."

> "You get comments specifically related to your work. I found this very helpful."

A number commented on the fact that the feedback was not only personalised but also discreet and private. Several students indicated that they often feel that within the class there can be sense of competition between students to achieve the best grades and students who fall short of this can feel embarrassed, demoralised and demotivated.

> "I feel when students are given their assignments for 10-15 minutes during class we may feel under pressure to accomplish a better grade as we tend to

> compare our work to the other students in the classroom and then if we see that we may not be doing as well as other friends or classmates it may cause more negative feeling as students could feel embarrassed that they are not doing as well as they had hoped and therefore have no sense of achievement."

In line with the literature in the area one of the key outcomes of this research was that students clearly found the audio feedback helpful. In fact, virtually all the respondents indicated that they valued the opportunity to listen and re- listen to the feedback at a time and in a place of their choosing.

> "It is easier to process feedback as you can go back over it in your own time."
>
> "That it was personal, and you can access the assignment as many times as you wished."

The students also indicate that having the audio feedback also benefits them when preparing assignments for other modules and they were able to use the feedback given to enhance and improve their grades in assignments for other modules also.

> "Definitely so helpful and I've seen my other assignments improve since this."

One of the most common responses was that they would like to get audio feedback from all their lectures.

> "Would love if every lecturer would do this"

6. Lecturer reflections

Evaluating and assessing student course work is a fundamental responsibility of lecturers. This process of providing and receiving feedback can be an emotionally charged experience for both the student and the lecturer alike. One of the major challenges is providing timely and comprehensive feedback to students. Traditionally feedback has been provided via marking sheets and providing student with an opportunity to view their assignment feedback and ask any questions they may have regarding the same. However, many students fail to avail of this opportunity and very often it is only students who do very well or students who wished to question their grade show up to the feedback sessions. Therefore, I felt there was a need to reach out directly to each student in a more positive and personalised way, and to try to engage as many of them as possible in the feedback process. Electronic and audio feedback has provided me with an opportunity to do this.

By using audio feedback, I was able to speak directly to students. I was able to provide them with clear and comprehensive feedback that they could access time and time again. Also, via the audio feedback I encouraged students to place more emphasis on engaging with the feedback rather than the grade. I attempted to encourage this by releasing the audio and electronic feedback to the students two days before I made their grades available. I was also able to monitor who had reviewed the feedback.

Electronic and audio feedback also provided me with an opportunity to provide my students with feed forward. Prior to engaging with this project previous the MA students wrote an assignment weighted at 60%. I would grade it and provide feedback, however the feedback was redundant as this programme runs for one year, so they had no opportunity to use the feedback I provided to improve and enhance their grade. Therefore, by providing these students with an opportunity to submit a draft assignment, the feedforward provided each student with an opportunity to engage with, process and implement the feedback into their final submission which would then be graded. This gave the students an opportunity to improve and enhance their submission and ultimately their grades. This did in fact happen, most of the final submission were substantially better than the original draft.

I now provide audio and electronic feedback to all my students across all the programmes that I am teaching. Since the beginning of this academic year 2018/2019, all my assessments are via the use of digital technology and as a result I have gone paperless which also has a positive impact environmentally. Now I cannot imagine retuning to the more traditional methods of doing assessments and providing feedback.

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Partnership, student orientation and peer mentoring: Embedding students as partners as 'culture' in a new Social Sciences programme

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Abstract

Students as Partners has emerged as an important research topic and practice in Higher Education. It involves faculty, staff and students each sharing their particular expertise and working together to achieve common goals. The approach engages students more fully both with their institution and their learning and encourages the development of students' decision making capacities as well as their sense of belonging to the university (Cook-Sather *et al.*, 2014; Healey *et al.*, 2014). In 2018, a decision was made by the Social Sciences Programme Board at University College Dublin (UCD) to adopt a 'Students as Partners' approach to enhance student engagement. This paper will present findings from a subsequent research project involving Social Sciences faculty, professional staff and undergraduate peer mentors. It adopts a scholarly approach to investigating the impact of several of the initiatives that followed.

A new Peer Mentor programme for Social Sciences students was introduced in 2018 using 'Students as Partners' principles. The team agreed that the objective of orientation was to welcome students and engender a sense of belonging to their academic subjects rather than focusing on information provision. Over the summer paid undergraduate student interns worked on orientation planning, including a partnership approach to peer mentoring, with the new social sciences programme team. During their training, all peer mentors were invited to join a research team to co-evaluate the partnership approach with faculty and professional staff; eight peer mentors volunteered and two will co-present the conference paper in Bilbao with a faculty member of the team.

This paper explores interns and peer mentors' perspectives on their experiences as co-designers and peer mentors. It assesses the extent to which the ethos, design and delivery of orientation was understood in partnership terms across the different types of partners: faculty/staff; student interns; and peer mentors. There was a variable awareness of partnership across the different groups but also of understanding it as a *process* of engagement (Healey *et al.*, 2014). Contrary to fears that partnership will potentially become instrumentalised in an increasingly managerial higher education environment (Tomlinson, 2017), our research indicates that the intrinsic value of partnership was recognised and supported across the partners despite time pressures, other costs and challenges.

1. Introduction

In line with paradigm changes in the broader social sciences, partnership has recently become the focus of much interest within higher education. Partnership can be defined as the engagement of a range of stakeholders with each other to achieve a common goal (HEA, 2014). In recent years, partnership has been the focus of much work in higher education (Bovill *et al.*, 2011; Healey *et al.*, 2014). Given the many demands on higher education institutions, working in partnership has the potential to contribute to a range of goals including the development of graduate attributes, improving staff-student relationships, enhancing employability, adopting more scholarly approaches to teaching, student learning and engagement (Bovill *et al.*, 2016). The approach engages students more fully both with their institution and their learning and encourages the development of students' decision

making capacities as well as their sense of belonging to the university (Cook-Sather *et al.*, 2014; Healey *et al.*, 2014).

Healey *et al.* (2014) suggest the need to consider partnership as a process that engages students more fully with their institution and their own learning. While all partnership generates engagement, not all engagement is partnership. Partnership is a way of working, usually with specific student groups, that achieves broader objectives and it moves towards empowerment of students with decision-making capacity rather than just affording them a consultative role. What characterises partnership is the involvement of students with both the process and the outcome and the sharing of the risk and the rewards of the endeavour between all parties (HEA and NUS, 2011). Partnerships occur at both the individual and institutional level, in various contexts (HEA, 2014) and may embrace a diversity of stakeholders. In 2018, a decision was made by the Social Sciences Programme Board at University College Dublin (UCD) to adopt a 'Students as Partners' approach to enhance student engagement across the new undergraduate programme. This paper focuses on a subsequent research project investigating the impact of one of the initiatives that followed, involving a research team of two Social Sciences faculty, one member of the professional staff and eight undergraduate peer mentors. It speaks to two of the EuroSoTL conference themes: Experiences that stimulate student engagement and Developing inquiry and research in undergraduate students.

1.1. **Background and Context**

University College Dublin is a large, research-intensive university in the Republic of Ireland. Since 2007, enhancement of the first year student experience has been a core part of consecutive institutional strategies (Gibney *et al.*, 2011). Orientation is a key support to help first year students transition to University and to make friends in their programme (Tinto, 1975). Research on student transitions highlights the importance of this key period, as those who have difficulties with the transition may perform poorly and/ or disengage at an early stage from university life (Lowe and Cook, 2003; Pitkethly and Prosser, 2001). All incoming students are invited to campus the week before classes start for their first face-to-face introduction to the university. Overall across the university 95% of students take up this opportunity annually and feedback from incoming students is that it is a positive and useful experience.

In 2016, a decision was taken to restructure Social Science undergraduate education at UCD, and a number of working groups —including a students as partners working group— were established by the Associate Dean (one of the coauthors of this paper SOS) to progress various elements of curriculum design. The desire was that the new programme (extended to four years from three) would achieve a range of curricular and wider objectives, and partnership working was identified as a core culture or ethos that could support these goals. Informed by the literature that highlights the value of partnership working in building sense of belonging, heightening levels of engagement, and building identity (see for example Moore-Cherry *et al.*, 2016), senior leaders and administrators made a commitment to supporting this approach. It was recognised that not every student will be able, or want, to participate in partnership working but the new programme sought to promote a culture of opportunity for engagement and partnership.

The Working Group, led by one of the co-authors of this paper (N M-C), identified orientation as a key place and time where partnership working between the College team, faculty and students could showcase the desired culture of the new programme and College.

Central to orientation at UCD is peer mentoring. Students in their second or third year volunteer to mentor incoming students taking one of the same social sciences subjects. In 2018, informed by 'Students as Partners' principles, a new partnership approach to the planning and implementation of Orientation was taken. Orientation was targeted as a useful space to begin to create engaging, interactive and student friendly partnerships that would allow stronger relationships with faculty and peers be created (Bozick, 2007). The objective of orientation was revised to welcome students and engender a sense of belonging to their academic subjects rather than the more traditional focus on information provision. Over the summer paid undergraduate student interns worked on orientation planning in partnership with staff and faculty. A partnership model to the deliver of peer mentoring was also developed, and peer mentors were given the freedom to decide how they would structure orientation activities with their mentees. During their training, all peer mentors were also invited to join a research team to co-research the partnership approach with faculty and professional staff; eight peer mentors volunteered (including two of the co-authors of this paper AA and CS). The partnerships developed were student-faculty-staff as well as student-student, and crossed orientation planning, peer mentoring, and research activities as a way to begin embedding this new ethos within the College.

2. Methodology

This study adopted a mixed methods research design combining surveys, reflective diaries and a focus group. From the entire peer mentoring cohort, a total of 49 people volunteered to participate in the research. All 49 completed the survey, 35 completed reflective diaries and 5 participated in a follow-up focus group. All were current undergraduate second year Social Sciences students who had applied to be peer mentors to incoming first years in the academic year of 2018/2019. The nature and purpose of the research was described to all mentors at a training day in May 2018 and signed consent was received from those who agreed to participate. There was no academic or monetary reward for participation. Approval from the UCD Human Research Ethics Committee was obtained before data collection commenced.

The survey comprising open-ended questions was administered before the first of two training days and asked current peer mentors to reflect back on their experiences as a first year mentee and to consider what they thought would characterise a good peer mentor and peer mentoring experience. Reflective diaries were the primary method used to capture the peer mentors' experience of co-designing a mentoring programme for other students, as well as their experience of being a peer mentor (see also Hall and Jaugietis 2011). There were four questions for students to complete each week; the questions were drawn up by the faculty members of the research team in consultation with one of the peer mentors.

There were a total of 35 rich and detailed entries by 31 peer mentors in the first two weeks of the semester, with 4 mentors completing 2 entries. As the semester got more busy for the peer mentors the entries deteriorated. In order to gather greater insights into the experience of being a mentor, a lunchtime focus group was undertaken and lunch provided as an incentive to participate. The focus group covered a wide variety of topics, from the experience and perception of the the role to the benefits of being a peer mentor. Both these sources of data was thematically analysed by peer mentors who were members of this research team.

Finally, interviews were completed with (a) 5 students who had been formally involved in the planning and setup of the orientation programme, contributing as members of

committees and/or working as paid interns in partnership roles over the summer and (b) two key members of staff who had worked closely with the summer interns and had been centrally involved in both the set up and delivery of the orientation programme. This interview data was thematically analysed by staff and faculty members of the research team.

3. Experiencing Partnership

3.1. Peer mentors

Key themes that emerged and will be presented in more detail include:

— an apparent gap between the expectations of peer mentoring and the realities in practice
— the benefits of mentoring to the mentors which included an enhanced sense of institutional belonging
— an expansion of academic and social networks
— the centrality of emotion to the peer mentoring experience and the challenges of managing emotions.

3.2 Interns

Key themes that emerged and will be presented in more detail include:

— the benefits of this work experience which included the development of key skills and an enhancement of confidence and perceived employability.
— a sense of enhancing student supports through the work
— the pleasures and challenges of partnership working.
— feeling a greater sense of belonging to the University that has carried through into their ongoing studies and engagement with the College.

3.3. Staff

Key themes that emerged and will be presented in more detail include:

— allowed access to a different, valuable source of expertise for key project work and ensured the development of appropriately targeted material.
— a quality enhancement measure, ensuring materials and events were authentic
— provided staff with a valuable experience and learning as an employer of interns that will be beneficial to the development of a wider cross-Programme internship scheme
— the pleasures and challenges of partnership working.

4. Impacts of Partnership: Co-Research Team

The students as partners project has empowered student members to take ownership of the future direction of the peer mentor programme, producing a report containing specific recommendations. Planning for peer mentoring in the 2018-19 academic year has been

informed by the recommendations, with several implemented in full or in part and others on the College work plan for future years.

The project has made the value of partnership working visible to colleagues at UCD and may stimulate further partnership activity. The findings from the research has been widely disseminated and has made the Students as Partners ethos visible within the College, across the University and more widely.

- presentation by two student members of the team to Faculty at the Social Sciences Programme Board
- presentation by two student members of the team to other peer mentors, the College Principal and student advisors at the end of semester Peer Mentor celebration
- presentation by two student members of the team to the UCD community at a Work Smarter Together seminar
- EuroSoTL presentation by two student and one faculty members of the team
- a journal article on the experience of being a peer mentor is currently being finalised by four of the team, led by two of the student members.

We will present reflections on the experience of the members of the team of participating in this research project.

5. Discussion and Conclusion

This paper reports on first steps in the process of establishing and mainstreaming a partnership culture and ethos at programme level. One change that has been created is a redefinition of who is the expert, with student expertise made visible to a range of stakeholders. Taking a partnership approach to orientation has taught us is that it requires an openness to discomfort and recognising that partnership includes getting things wrong as well as right (Bryson and Furlonger 2018).

Our research indicates that the value of partnership was recognised and supported by the partners despite time pressures, other costs and challenges. There was no evidence to suggest that it was an instrumentalised form of partnership (Tomlinson, 2017). There were differences in its' visibility across different types of partnerships. In the faculty/ student and staff/ student partnerships the concept was central to how respondents discussed the project work, and a shared understanding of partnership developed over the project. Partnership was least visible in the peer mentor data where the focus was more evaluative and the the role was not always seen as a student/ student partnerships. A key question that will be considered is whether its lack of visibility is necessarily problematic.

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Students as partners in research in higher education: the views of students from a socio-economically disadvantaged area

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Abstract

Higher education in recent years has seen the expansion of active and collaborative teaching and learning and there is an emerging discourse in SoTL on 'students as partners'. These initiatives are diverse, including for example the co-construction of curriculum design and co-inquiry in research and evaluation. The principle of inclusion of hard-to-reach students and previously excluded groups has been highlighted as being of particular importance (Bovill, 2017). However, evaluating the impact of such partnerships has thus far received less systematic attention. This paper argues with Bender and Grey (1999, 4) that teaching, like other forms of scholarship 'must not only be reflective, systematic and replicable, but public'. It thus presents an evaluation of a participatory research project where academics partnered with students in one of the most socio-economically disadvantaged estates in Cork City, Ireland which is currently undergoing regeneration.

The project involved 15 mature students enrolled in a part-time Diploma (60 ECTS credits over two years) with the centre for Adult Continuing Education, UCC. Most were early school leavers and faced barriers engaging in higher education, including financial and socio-cultural. A module was specifically designed whereby the students and academics co-constructed a household survey and became field researchers to gather the views of fellow residents on the regeneration of their area. The paper analyses the students experience of partnership with academics from their own point of view to assess what difference their engagement in the project made to them. Overall, the paper documents the process of co-inquiry with students from a disadvantaged area and aims to ascertain how meaningful was their learning experience.

1. Introduction

'Students as partners' (SaP) is an emerging discourse in the SoTL and is based on a shared ethos of moving students from a position of learning *from* to learning *with* academics. SaP includes diverse initiatives from the co-construction of curriculum design and assessment to co-inquiry in research and evaluation. Such approaches seek 'to engage students and staff as collaborators on teaching and learning endeavours, establishing collegial working relationships based on reciprocity, mutual respect, shared responsibility, and complementary contributions' (Marquis *et al.*, 2017: 720). The benefits of student-staff partnership initiatives are many and include deepening learning through engaging a diversity of perspectives, a transformed sense of self, enhancing staff and student motivation and developing trust between teachers and learners (Marquis *et al.*, 2017; Matthews *et al.*, 2018). But there are also concerns and challenges, in particular related to power relations in the partnership process and which students can avail of or have the opportunity to engage in partnership. Bovill (2017) emphasises the importance of inclusion as a principle underpinning SaP practice and highlights the importance of enhancing inclusion of hard-to-reach students and previously excluded groups.

While SaP is a more recent development in SoTL, in the social sciences there has long been a focus on collaborative working through community-based and participatory research.

These focus on involving community partners in co-creative approaches to understanding and tackling issues facing communities. Community based research is defined as 'a collaborative approach to research that equitably involves all partners in the research process and recognises the unique strengths that each brings' (Kellogg Foundation quoted in Faridi *et al.*, 2007: 2). Bergold and Thomas (2012) define participatory research as a methodology that 'argues in favor of the possibility, the significance, and the usefulness of involving research partners in the knowledge-production process; research methods are geared towards planning and conducting the research process *with* those people whose life-world and meaningful actions are under study'. They propose that the primary aim of participatory research is to give members of marginalised groups a voice and they highlight the gains to research through bringing the experiences, everyday knowledge, and ability of the participants into the research process as well as the gains to the individuals involved through gaining new perspectives and insights. Both the literature on SaP and participatory research explores how the extent of participation can vary and Bovill (2017) presents a matrix of participation regarding student-staff partnership in conceptualising collaborative evaluation.

However, evaluating the impact of student-academic partnership has thus far received less systematic attention despite the extensive body of literature on collaborative approaches to research. Studies tend to focus on the challenges and facilitating factors to partnership which, while valuable, neglect outcome measures and the development of evaluation frameworks (Faridi *et al.*, 2007). Most research conducted on community-based participatory research focuses on process rather than outcomes and impact (Piggot-Irvine *et al.*, 2015; Faridi *et al.*, 2007); this is similar in research to date on students as partners (Ahmed *et al.*, 2017; Coombe *et al.*, 2018), with the exception of Curran (2017) who focuses on impact in terms of personal development and enhancement of the learning climate. This paper therefore presents an evaluation of a participatory research survey conducted with the collaboration of mature students from a large social housing estate in Cork City, Ireland that is currently undergoing regeneration. The evaluation explores the experiences of both the academics and student partners involved in the survey. This paper presents the students' experience of partnership with academics from their own point of view and assesses what difference their engagement in the project made to them.

2. Methods

In 2014, Cork City Council commissioned the School of Applied Social Studies to evaluate the implementation of the Cork Northwest Quarter Regeneration (CNWQR) Masterplan. The CNWQR programme involves the demolition of 450 houses and their replacement by 656 new housing units in Knocknaheeny, one of the most deprived areas in Cork City with a young demographic, high unemployment, and low levels of education in comparison to the rest of the city.

In 2015, three academics co-designed a household survey with 15 mature students (see acknowledgements in section 5 below) who were resident in Knocknaheeny and were enrolled in a part-time Women's Studies Diploma with ACE in UCC. Most of the students were early school leavers and had faced barriers engaging in higher education. For the survey, the students undertook a specially devised 5-ECTS credit module on 'Research in the Community' and through a series of workshops facilitated by the academics, they co-designed the questionnaire and became field researchers to gather the views of fellow residents. The survey was followed up with a focus group meeting in late 2015 between the researchers and the Cork City Council Regeneration team to discuss the findings; key

findings were distributed in a community newsletter to all households in the area; and follow up focus groups were held with other residents in 2016.

In 2019, an evaluation was conducted on the process of the survey in order to consider what had worked well, how satisfied were the mature student participants with the partnership and what difference did it make to them (as asked by Vortruba, 1996). Consistent with the survey, the evaluation also followed a participatory methodology, incorporating 'user engagement in determining, designing and analysing research questions and approach' (Johnson *et al.*, 2019: 17). A focus group was initially held with five of the original survey participants to discuss the evaluation interview questions. Qualitative semi-structured interviews were subsequently held with 10 participants and conducted by Dr Mark Cullinane, who was new to the project and thus brought independent voice and insight. The interview questions included a focus on the ways the student participants felt they influenced the design of the research and its implementation, what they liked about the project, what they would change, what they gained from their participation and from studying and engaging with UCC.

3. Results

This section presents two dimensions of the findings. The first relates to satisfaction with the partnership process and project outcomes, while the second relates to personal/subjective benefits in terms of growth in confidence, enjoyment and friendship, and knowledge and progression of education. Pseudonyms are used in all of the quotes.

3.1. Satisfaction with Partnership Process and Project Outcomes

Many of the participants spoke of how they felt influential in the research process and that their input was valued by the academics. They saw the importance of their participation in terms of their familiarity with the area and that their local knowledge enhanced the questionnaire as they knew what to ask and how to ask it.

> 'And when it was all being put together and you know, when we were all in the group doing the work, we were all treated like...like our input was important and what we were doing was important and appreciated.' (Máire)
>
> 'It was great that everyone had an input … I thought it was absolutely magical, the intelligence of all the women that were involved in putting this together, because they really came out with the very very important details that we felt as women up here that we needed to ask.' (Roisín)

Some felt that they bridged the barrier between the academic environment and the local community as they spoke the 'language' of their community, would be known in the area and would be more trusted than the academics.

> 'I'll put it like this to you Mark. You have UCC speak, and you have our speak. I'm not putting one down or one up, right? But you need our speak to go around, because if I was using UCC speak, they'd say what are you on about, you know what I mean, it'll put people's hackles up anyway, yeah? It's like... escalators and a lift, you know.' (Margaret)

> 'There was loads of people that would've had connections with our families, well our mothers...I think that made it a bit more personable with people as well, d'you know that I suppose you're talking to people on the same level rather than people from the outside coming in' (Áine)

While many were highly satisfied with the process of the survey being developed and carried out, several of the participants felt that there was insufficient follow up regarding the impact of the survey and that they would have liked to have found out more about what the City Council did with the results.

> 'We don't know what the outcome of this, we don't know how it was handled, was it put on the back burner, and we just done the survey and that was it.' (Carmel)

> 'When it comes to the end of it like, it was like we found out nothin. Like, we went out and done this, at the end of it we don't know what happened, where it went, what happened' (Sandra)

These reflections underscore the importance of continuing to communicate the impact of the survey, which may be incremental and not immediately evident straight after the completion of the work.

3.2. Personal benefits

3.2.1. *Growth in Confidence*

Both the literature on SaP and participatory research highlights how when partners feel influential in a collaborative process, when they find they are taken seriously as co-researchers and develop more and more research competencies, their confidence is developed (Bergold and Thomas, 2012; Curran, 2017). This finding is replicated in this study and many of the participants spoke of how much their confidence was enhanced by engaging in the project design and in the fieldwork.

> 'yes, I can be educated, I'm not stupid, I'm not ignorant, I have something to contribute.' (Liz)

> 'going around to the houses and speaking to people, like that would give you confidence in yourself, d'you know what I mean?' (Maire)

One of the participants highlighted how her engagement with UCC transformed her self-understanding.

> 'I married very young, and you're the housewife, you're the mother, you're, you know...you're the daughter that have to run to your mother and look after her, when they're getting older, god bless them right, and it's like...finally doing something for myself, realising that I'm a human being and I have an important part to play in life, like I said I was goin to meetings before, I was interested, and that was a great help to kind of build up my confidence, to have a better understanding.' (Roisin)

3.2.2. *Enjoyment and Friendship*

For many, the enjoyment and friendships they gained in the process of collaboration and conducting the research in the community was also highly significant.

> 'It was very enjoyable. I love this kind of thing. I love doing research, I love getting the information that they get from it, but I also enjoy the women, being with the women so much, I love being out in the community, I love talking to my neighbours. The whole process is enjoyable, it really is now, very enjoyable.' (Liz)

Their friendships have been sustained over time and many from the group continue to meet weekly in the local area following the completion of their studies.

> 'Do you know the best thing of all, I met great friends. You know? Great friends here….Didn't know one person. Now I' m not a shy person anyway, and I love meeting new people anyway, but I made such great friends. And I've had so many laughs, continuing over the years.' (Margaret)

3.2.3. *Knowledge and Progression of Education*

Learning how to conduct a research project was valued by several of the participants, especially given the significance of the project informing the CNWQR programme.

> 'I never would've had been asked to give input on putting a questionnaire together that was going to be used. … this time, you know I contributed to the compilation of a questionnaire that was put into practice. And then you know there's an end product at the end of it. I thought that was brilliant.' (Maire)

> 'like I never did a research project, but it was good to know, I suppose, how to set up one and how to do one' (Aine)

Some of the participants highlighted how they also learned new aspects from meeting their community during the fieldwork.

> 'I enjoyed it, we were meeting people and listening to their list of complaints about what was going on, why they weren't happy with things, and you'd learn things that you wouldn't have thought about really.' (Nora)

This led to a transformed perspective for Aine on parts of the neighbourhood that she had preconceptions about growing up.

> 'even though I'm from kind of this side of the community, I would never have been down around some of the places, … I suppose, when I was growing up as well, an awful lot of it would've been a no-go area. That, I wouldn't have gone over there, and I wouldn't have been allowed to go there, I'd have been afraid to go there, and I suppose going back as an adult...it wasn't daunting at all, and the people were lovely there, and the houses were beautiful as well.'

For two of the participants, taking part in the Diploma and the research in the community opened new opportunities and they subsequently went on to graduate from Bachelor degrees in UCC.

> 'It gave me the encouragement that I needed to apply for my degree, and that's what I actually got out. Now I'm delighted I did my degree, and I'm delighted because I loved going to college and everything like that, and I loved all that like, so yeah, it set me on my road' (Eleanor)

4. Concluding Reflections

The evaluation highlights the significance of working in partnership with mature students from a disadvantaged area from the students' point of view. Their engagement in applied research had significant personal impacts and benefits. The participants spoke of their sense of the value of the work that they contributed, highlighted their growth in confidence and their enjoyment of new experiences and development of friendships, and explored the learning and broadening of their horizons that they gained. The participants also hold critical, insightful reflections on the process of partnership that can inform our future practice, in particular the importance of seeing and communicating project outcomes. While this was a short term, though in-depth involvement in a research task, it drew on and developed the students' capacities and skills and was a meaningful learning experience for a group that had previously faced educational disadvantage and exclusion.

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Setting the Tinderbox of Student Engagement Alight: Drawing on the Principles of SoTL to Stimulate Activism in an Undergraduate Module on Sexualities and Society in University College Cork (UCC), Ireland

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Abstract

The imperative for research and education to address societal and community challenges increasingly underpins Higher Education academic strategy. The Irish National Strategy for Higher Education to 2030, calls for teaching and learning strategies that, 'teach civic responsibility and strengthen communities' (Hunt 2011, p.76), and UCC's Civic Engagement Plan 2017-2022 (p. 22), pledges to 'create value for our community through an international outlook and informed and creative engagement on local and global issues'. A 'good problem' then for us as teachers, was that of exploring how we could enable students to develop competencies for reflecting on social issues and applying knowledge to facilitate change in civic contexts. Focusing on a final-year undergraduate module entitled *Sexualities and Societies*, delivered to students on Social Science and Youth and Community Work programmes, we set out to ensure that our curriculum and the methods we were using to uncover it, went beyond the promotion of subject expertise, to create a learning environment where students could develop skills for informed and creative engagement with the wider civic sphere. This paper makes public the story of our pedagogical efforts to support and encourage students to critically interrogate and challenge discriminatory practices in the area of genders and sexualities. We share examples of 'what works' and of 'what it looks like' (Hutchings 2000), with particular emphasis on the integration of new digital technologies in our work. The paper concludes by highlighting the possibilities for dynamic collaborations between teachers, students, the academy and the community and reflecting on the role which the principles of SoTL can play in setting the tinderbox of student engagement alight.

1. Methods - Naming the 'Good Problem' in Our Teaching

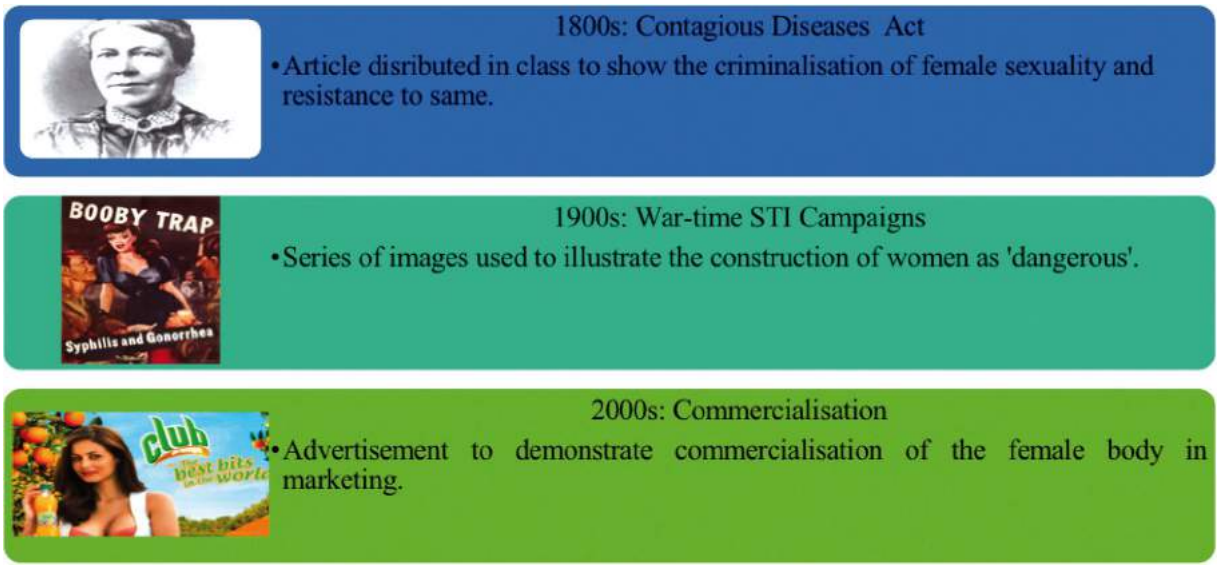
Sexualities and Societies is a final-year undergraduate module that we deliver to 52 students taking programmes in social science, youth and community work and social policy. The student cohort includes students who entered university directly from second level school, mature students who entered aged 23 and over, and visiting students on Erasmus and US Semester Abroad programmes. The module explores how conceptualisations of sexualities and genders shape social policies and determine constructions of 'appropriate' and 'acceptable' sexualities. The through-line focuses on the nature and mechanisms of sexual and gender regulation over time and place, highlighting how power is implicated in the construction of inequalities and discrimination, and tracing ongoing resistance and activism for change. The challenge for us as teachers, was to ensure that our curriculum and the methods we were using to uncover it, went beyond the promotion of subject expertise, to create a learning environment where students could develop the skills required for informed and creative engagement with the wider civic sphere. This paper tells the story of our pedagogical efforts in supporting students to develop 'insightful competence' (IUA, 2015) for critically interrogating and challenging discriminatory practices in the area of genders and sexualities.

Our interest in sparking a citizenship orientation in students is value based, reflecting our commitment to promoting equality and inclusion. The imperative to address societal and community challenges, increasingly underpins Irish Higher Education strategy. The *National Strategy for Higher Education to 2030* encourages Higher Education Institutions (HEIs) to 'teach civic responsibility and strengthen communities' (Hunt 2011, p.76), a sentiment reiterated in the Irish Higher Education Authority *Systems Performance Framework 2018-2020* (p. 11), UCC's *Civic Engagement Plan 2017-2022* and goal three of UCC's *Strategic Plan 2017-2022* (p. 22) which pledges to 'create value for our community through an international outlook and informed and creative engagement on local and global issues'. As such, the 'good problem' for us as teachers was that of exploring how we could teach and assess in ways that enabled students to develop competencies to reflect on social issues and apply knowledge to facilitate change in civic contexts.

1.1. 'Uncovering' the curriculum

Guided by our goal of teaching for change, we responded to Bass' (1999) call to teach for understanding rather than for coverage. We crafted the curriculum to allow empirical data and conceptual ideas to unfold in an iterative way and built teaching sessions around problem-based, case-studies such as that documented in Figure 1 which provides students with examples of the problematisation and regulation of female sexuality in different times and places.

Figure 1
'What is the plot?' – Uncovering constructions of female gender and sexuality over time and place



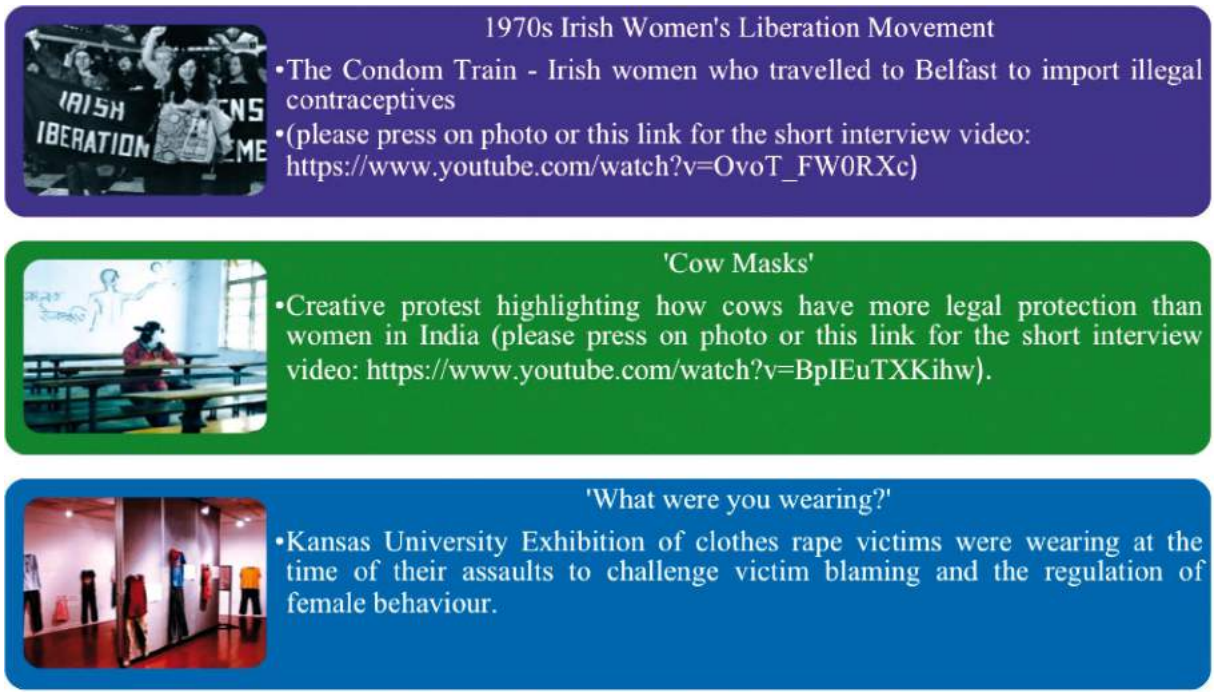
Shulman, 2004, p. 9.

Our commitment to connecting pedagogy with active citizenship, led us to systematically thread examples of the application of knowledge for change into the weave of the module (see Figure 2). This strategy of examining power dynamics in everyday practices

was devised to develop students' competencies in critical reflection, and course materials were selected for their potential to incite students to reflect on their own views and the roles they might play as change agents.

Figure 2

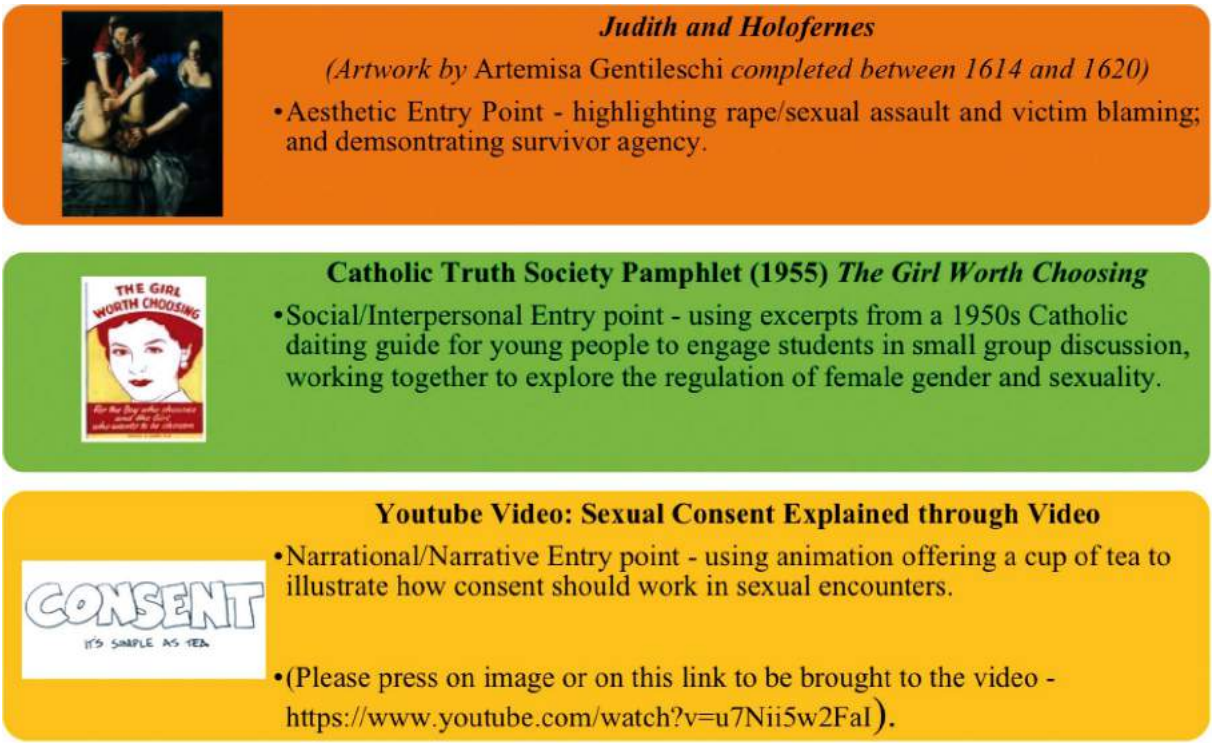
The Application of Knowledge for Activism – Case-study Activism to Challenge Control of Female Sexuality



The theories of power and sexuality anchoring the module conceptually, were introduced in a staged way as explanatory tools for unpicking the issues profiled in the case-studies. This approach was designed to 'hold the attention of students more effectively and consolidate their learning more durably' (Shulman, 2004, p. 9). We deliberately drew on a range of multi-media artefacts (art, newspaper articles, health promotion materials, *Youtube* clips, etc.) to support multiple entry points into the generative topic. This provided opportunities for students with different intelligence profiles (Gardner, 2006) and life experiences to examine and build on prior learning and to find ways into the topic that suited their learning styles (See Figure 3).

Figure 3

'A room with at least five doors or entry points into it' - Using Multiple Entry Points to Scaffold Learning'



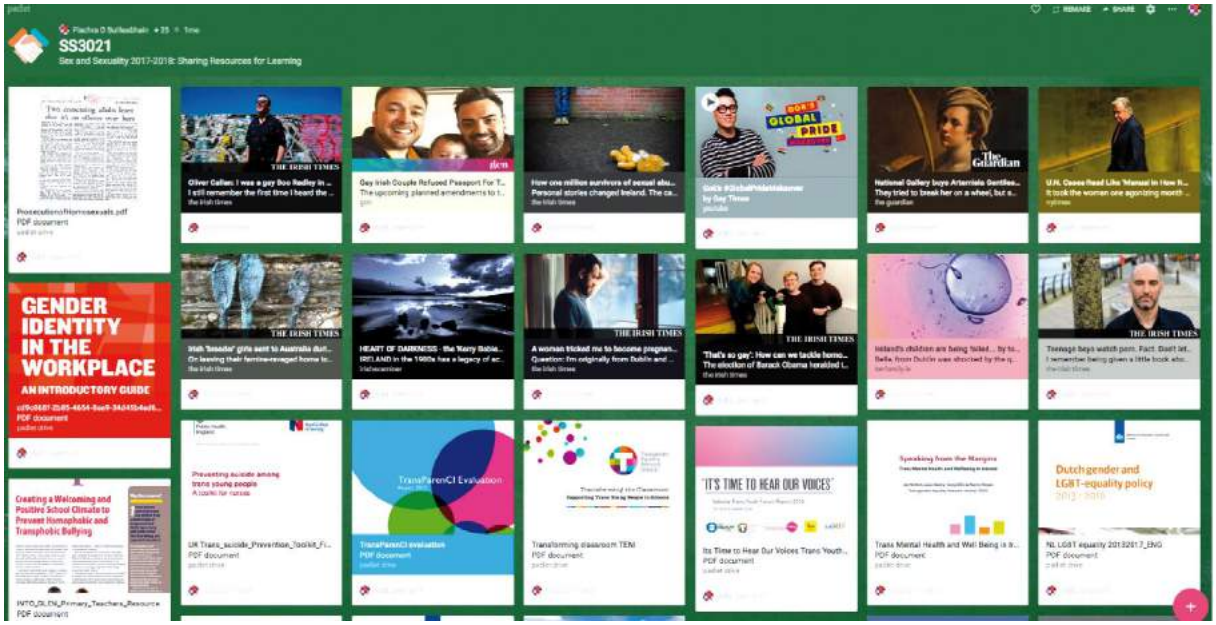
Gardner, 1991, p. 245.

1.2. Employing digital technology to scaffold discursive and disruptive learning environments

Our focus on promoting equality, inclusion and civic engagement, translated into a teaching approach, which prioritised including students as partners in the learning process (Healey, Flint & Harrington, 2014). Recognising Foucault's (1975) contention that classroom design imposes passivity on students, we challenged ourselves to create spaces that encouraged active and disruptive learning. We aimed to create a collaborative classroom, which recognised students' prior knowledge (Gardner, 1985), their capacity to learn from each other and their potential as curriculum co-creators. Classes were structured around three interactive learning activities, primarily group-based and scheduled at the start, middle and end of the session. We used *Padlet* (an online bulletin board) to enable students to anonymously suggest curriculum content, share sources, ask questions and provide feedback. *Padlet,* allowed us to co-curate a range of materials with students and provided a platform for them to demonstrate learning, by making connections between the module and societal issues encountered outside the classroom (see Figure 4. We also employed *Padlet* to archive materials generated from in-class activities, allowing students to go back and review the work generated by others in the learning cohort. This extended the student learning-opportunities created by in-class activities, and provided us as teachers, with another evidence base for assessing student learning.

Figure 4

'Going Public' - Using Padlet in co-creating discursive spaces within and beyond the classroom



McCarthy and Supple, 2017.

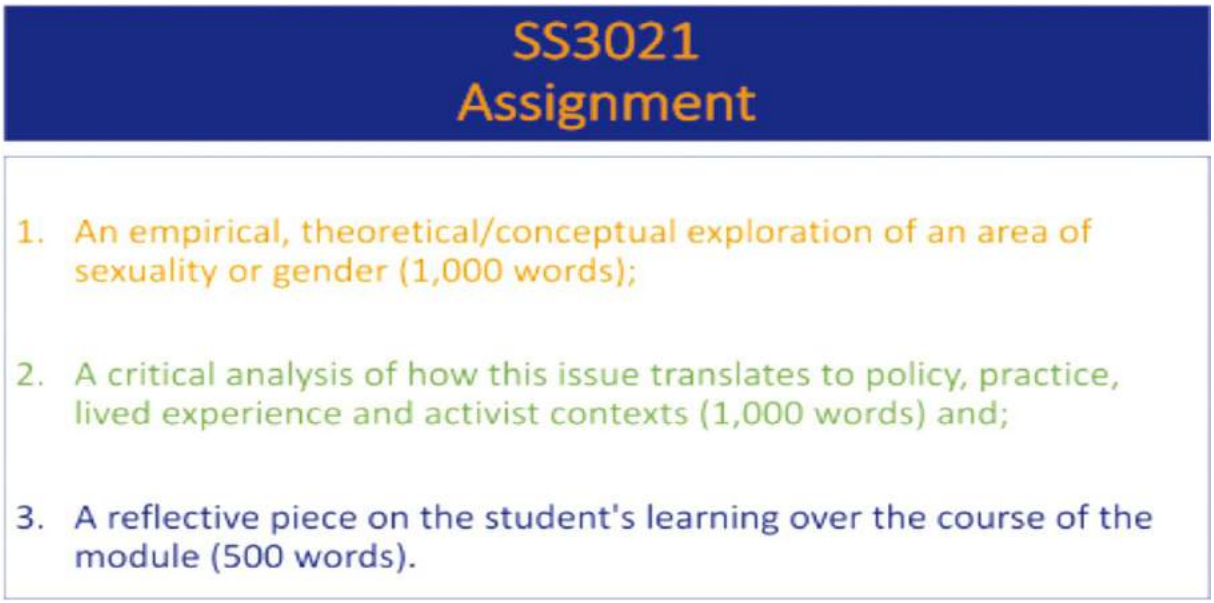
PollEverywhere (a live polling app) supported CATs (Angelo and Cross, 1993), which examined students' knowledge about the various issues under discussion. For example, we provided students with statements about the experiences of LGBT+ people and they rated them as true or false. This generated interactive discussion based on the results displayed live on the screen and facilitated guided inquiry and deep discussion about the discrimination faced by particular groups such as LGBT+ people. By 'going beyond their private thinking and involving them in publicly demonstrating their understanding' (McCarthy and Supple, 2017, p. 68), *PollEverywhere* provided a safe way to make the students' thinking visible and to challenge misconceptions and stereotypes.

1.3. Assessment to support the 'scholarship of application'

Our commitment to a scholarship of application that employs knowledge to foster change (Boyer, 1990), obliged us to re-evaluate the existing terminal examination assessment. An approach that developed and demonstrated students' critical and interrogative learning was required. We devised a portfolio assignment inviting students to discuss how a theory/ concept might inform change in an area of gender or sexuality and to reflect on their learning (see Figure 5).

To help students be clear about what we wanted them to learn, we distributed the assignment at an early stage and facilitated peer-learning by asking them to plan their response to the assignment, which was then reviewed by critical friends, providing a formative small-group learning experience.

Figure 5
Assessing the scholarship of application



2. Results – The Student Perspective: What Works and What it Looks Like?

Feedback was sought to help us reflect on whether we achieved our goals of creating an interactive learning environment which promoted a scholarship of application. Students' perspectives were gathered through an anonymous end of semester feedback survey distributed in the last teaching session and from the reflection section of the students' assignments. Analysis of the data gathered from the reflection section of the students' assignments indicates that the module succeeded in supporting students to: reflect on and re-evaluate their own values and attitudes around sexualities and genders; to engage in critical inquiry into inequalities in sexualities and genders; and to translate these critical insights into informed discussions and engagement beyond the classroom. The indicative data excerpts below provide some insights into the students' learning.

2.1. Re-evaluation of values and attitudes

> 'Upon reflection, I feel like I've grown both personally and academically. This course has opened my eyes to the wide array of ideas and debate in the realm of sexuality. I have become significantly more self-aware and empathetic to the gay community as I discovered the various struggles they battled through.'
>
> (Student No. 21 – Irish Student)

> 'I think the main benefit of the course for me was that it challenged my thinking with every lecture.'
>
> (Student No. 11 – Irish Student)

'The derogatory use of 'that's so gay' to this day is something I must remind myself to remove from my vocabulary as it has been the slang for anything seen as unacceptable for the majority of my life. **I am ashamed now looking back that I could have been so cruel and judging but it was the environment that we lived in.**'

(Student No 45 – Irish Student)

2.2. Development of critical insights

'This module has really challenged my thinking in regards to what the social norm is in society on both a narrow scale such as college and also on a much broader, national scale. I have really begun to see that it takes a lot of hard work and activism in order to change people's opinions and that not all of society is capable of being so open-minded.'

(Student No 9 – Irish Student)

2.3. Translating critical insights beyond the classroom

'I learned an extensive new amount of information from this course… I am excited to now have the knowledge to participate in certain conversations regarding sexuality and society and share what I have learned with others who may not be as knowledgeable in regards to the subject.'

(Student No. 25 – International Student)

'Throughout the past few weeks my friends and I have had discussions after having this class on certain topics. My housemate is Indian and I came home one day and discussed the topic of female gender over in India and about why women wear cow masks. We talked about the significance of it and what it represents as a political question if women are less important than cows in the country.'

(Student No. 35 – Irish Student)

'My studies … have allowed me to critically analyse the society in which I live and have equipped me with the tools to examine the modern conceptions of sexuality. I have also been made aware of the need to maintain current momentum … to ensure that society continues to … become more open, more accepting and a safe place for all.'

(Student No. 17 – Irish Student)

2.4. Creating a discursive and disruptive learning environment

The data gathered from the feedback survey provided overwhelmingly positive responses about module content, design and delivery.

'I found the course content was laid out well as it flowed from one topic and related to the next. The mix of video, handout, group discussion encouraged personal experience and relevant learning.'

'Found the methods of including the class to be very helpful e.g. articles, Padlet etc., as they allowed me to hear someone else's voice around a topic and highlighted different issues.'

'I have learnt to be much more confident and vocal in expressing my opinions in front of others. … It really felt like such an open module. The hesitation and shyness about first answering questions or giving your opinions disappears quite fast. The main aspect of this was that everyone was entitled to their own opinion, and you would not be judged based on your own opinion.'

(Student No. 37 – Irish Student)

3. Conclusion – Setting Student Engagement Alight

The signature pedagogy (Shulman, 2005) of social policy is arguably a pedagogy of practice and performance, characterized by a commitment to providing students with: a broad and holistic evidence base; skills to engage in critical analysis and to project a critical voice; and skills to support ongoing reflexivity. The pedagogical experiment described above, emerged from our desire to teach in a way that reflected the deep structure of this signature pedagogy, while also responding to emerging strategies around equality and civic engagement. Our key learning is that students embrace opportunities to collaborate and rise to the challenge of reflecting on their values and their potential as agents of change. The students' feedback demonstrates that they experienced the module as interactive and engaging and that they felt part of a 'community of inquiry' (Shulman, 2004). Their feedback also flags increased confidence, self- awareness and critical engagement. Most significantly, it emphasizes the key importance of learning spaces where they feel respected and listened to. Providing students with opportunities to explore, express, and exchange their views in discussion with others, is we would argue, a pre-requirement of the scholarship of application (Boyer, 1990). The possibilities for dynamic collaborations between teachers, students, the academy and the community are immense, and the principles of SoTL contain the spark to set the tinderbox of student engagement alight. The next step for us as teachers, is to expand 'visions of the possible' (Shulman, 1998) by findings ways of giving students practical opportunities to tease out the complexities of advocating for change in contested, real-life contexts. And so a new 'good problem' (Bass, 1999) is born, and we are working to address it by designing a community-based workshop led by local civic partners, which will provide out students with a more applied, experiential learning context in which to further explore ways of applying their scholarship.

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Laurel vs Hardy: a PBL activity for motivating first year university students in Physics

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Abstract

We report an experience where first year students of the subject "General Physics" must model a leisure event observable in daily life using simple concepts already studied. Considering students' different backgrounds, one of the aims of this activity is to motivate and engage them by showing that the Physics they learn is able to explain many simple daily life phenomena. As it is often done in science, they must also be aware of the advantage of modelling a complex problem by starting with a simpler one. In particular, the example they had to explain is the following: two cyclists, a fat one (Oliver Hardy) and a skinny one (Stan Laurel) ride downhill on a bike without pedalling. Who goes faster and why? The activity was programmed to be solved in a 50-minute lecture where the students had to work in teams of 3 to encourage team-work and the habit of discussion. The students got the setting of the problem a few days before so they could work in advance on the driving question and review the concepts they needed to use. In order to check the previous work done at home, the day of the lecture, they answered a 4-question multiple choice Kahoot quiz during the first minutes of the session. During the next 30 minutes, the students worked in teams discussing their ideas and solving the problem, which they had to hand in so that the lecturer could later identify weaknesses in their reasoning. Afterwards, their learning process was re-evaluated using another Kahoot quiz and finally the lecturer solved the problem in the blackboard. The results of the first quiz showed that the students had not worked hard enough preparing the session. However, the second quiz demonstrated that after their discussion about the topic and the explanations by the instructors, they had significantly advanced in their learning process, answering correctly to the key questions. This activity was rated as very useful by most of the students, as it allowed them to identify their weaknesses and strengths in solving problems.

1. Introduction

First year university students in Science, Technology, Engineering and Mathematics (STEM) disciplins find the Physics subject hard and difficult to pass. There are many objective reasons which explain this observation: First, it is their first year in the university, where the teaching and studying systems change drastically from what they were used to in (high-)school. Second, they enter the university with very different backgrounds in Mathematics and Physics, and most important, the majority of them are not used to working on a daily basis and they are not even aware of its importance until it is too late. Even if the change of the teaching-learning process from a lecturer-centered teaching to a constructivist student-driven learning guided by the lecturer took place nearly a decade ago [1-7], the authors of this communication have the feeling that students still do not feel the responsibility of holding the leading role of their education. In addition to learning the contents of the subject, the students are supposed to develop abilities and competences.

The objectives now arise as learning-process results and competence achievements [8-9]. It is for this reason that in the last years we have implemented many different activities to promote the assimilation of as many competences as possible. For instance, we have tried to promote the routine of frequent study by setting Moodle quizzes at the end of every chapter so that students revise the subject on a regular basis (at least weekly) and we have found that the students passing these Moodle tests, regardless whether they are compulsory or optional, have a higher chance to pass the subject and with a better mark [10-11]. We have also designed many simple experiments that we show before starting a topic as a challenge to their intuition triggering their curiosity towards the topic they are about to learn and increasing their eagerness to understand them. This has proved to be a very effective way to motivate our students, which in overall have improved their performance in the subject [12-13]. With the aim of showing our students that they are able to explain simple daily-life related phenomena with the Physics they learn in first year, we have introduced in the last two academic years a new problem-based learning (PBL) activity involving the most basic law of Physics, i.e., Newton's second law. In this activity, students should also be aware of the advantage of treating complex problems by starting with a simple one and later adding more elaborated steps. Additionally, since they work in teams of three students, team-work and the habit of discussion is also encouraged. The setting of the problem given to the students can be found in Section 2. We will present the results in Section 3 and we will draw our conclusions in Section 4.

2. Methodology

The activity was prepared to be solved in a 50-minute lecture. The material with the driving question together with some hints to solve the problem using two toy-models and the timeline for the session was made available to the students through the course Moodle platform (called eGela in the University of the Basque Country) one week before. This way, they were supposed to work in the problem and revise all the necessary topics or ask any unclear issues to the lecturers in advance. The exercise solved by the students was handed to the lecturer at the end of the session, but it had no impact on the students' final mark. The lecturers used them solely as a way to identify weaknesses in students' reasoning. However, it is hoped that this activity was useful for the students as a self-evaluation instrument too. In order to check the previous work done by the students at home they answered a short Kahoot quiz before starting the activity. After the activity and before the lecturer solved the exercise in the blackboard a second Kahoot quiz was given to the students to quantify their learning progress.

2.1. Timeline of the activity

Fig 1 shows the timeline we proposed for the activity as it was given to the students.

Figure 1
Timeline of the activity as it was given to the students

This exercise will be solved in a lecture (50') according to this timetable.

1. This text will be published in eGela a few days before the D-day. Each student should read it carefully and review all the necessary concepts before the D-day. You can come to office hours if you have any questions.
2. (5'): We will check your previous work by means of a Kahoot quiz.
3. (10'): Sit in teams of 3 or 4 and discuss your ideas and previous work to solve the two exercises. Ask questions to the lecturer (if there is still something you don't understand).
4. (20'): Solve the exercise within the team. If there are still more questions the lecturer will answer them. At the end of the 20' interval, the written solution will be handed to the lecturer (1 per team).
5. (5'): A final Kahoot test to re-evaluate the exercise and the learning process will be run.
6. (10'): The lecturer will solve the exercise in the blackboard.

2.2. Driving question

Fig. 2 shows the driving question proposed for the activity.

Figure 2
Driving question of the PBL activity

There might be many keen cyclists among you. In that case you might have noticed that when two cyclists go downhill in parallel without pedalling and none of them acts as a screen to the other one, the fattest one (Oliver Hardy, onwards) moves faster than the thinnest one (Stan Laurel, onwards). See Figure 1. Did you notice this? Why does this happen? (See `http://www.cyclist.co.uk/in-depth/2873/fat-v-skinny-who-goes-downhill-faster`)

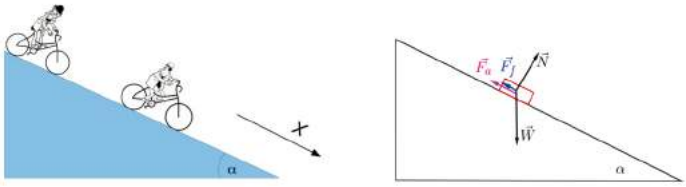


Figure 1: Left: Laurel and Hardy on the bike, downhill without pedalling. Right: Force diagram. $\vec{F}_f$ stands for friction force and $\vec{F}_a$ for aerodynamic or drag force.

2.3. Solving the problem step by step using two toy models

The students were suggested to solve the problem using two toy-models where many hints were given and some questions were posed to help them think critically the approximations they were using and the results they obtained. *Fig. 3* shows the description of the toy-models given to students.

Figure 3
Toy-models used to solve the PBL activity

We are going to solve a couple of short exercises which will help us to understand the result of the competition between Laurel and Hardy. As it is usually done in Physics, we will use a toy model, simple in a first approach, and more elaborated in the next one. What we want **to explain is the following observation**: *the fattest one (Oliver) goes downhill faster than the thinnest one (Laurel) (remember they are not pedalling).*

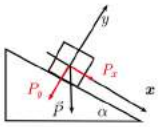
1. **Toy model 1:**
   Study the motion of any of the cyclists as if they were a (point) mass going down an inclined plane with dynamic friction, using the concepts studied in topic 3A. This model is very simplified because we are neglecting the rotation of the bike wheels, which is not too bad if we assume that both bikes are equal. Can the equations explain the observation? Why?
2. **Toy model 2: A bit more elaborated...**
   As we have seen in the lectures, when an object is submerged in a fluid, an aerodynamic or drag force acts in the opposite direction of the motion. This force is usually proportional to velocity: $\vec{F}_a = -k\vec{v}$. Imagine our cyclists are going downhill at full speed. Therefore a more elaborated model should also take into account the drag force (on top of the previous model). Before adding this correction, let's do further simplifying considerations.
   (a) The coefficient k is proportional to the cross-section (or surface, A) of the cyclist in the direction of the motion, that is, $k = \beta A$. Do you think this is a reasonable hypothesis? Would you jump from an airplane from a height of 3000 m without a parachute? And with a parachute?
   (b) We will suppose that the shape of Laurel and Hardy can be modelled by a sphere of radius R (each of them has its own radius R_L and R_H). Thus assuming that their bodies have the same density ρ_b, you should be able to write the mass m of any of them and their cross sections A as a function of their radii. Write them now (while you are reading this at home).
   Now add the aerodynamic force to the previous toy model. Use the following questions as a guide to explain your results:
   - Do you find a terminal velocity in the solution?
   - Is this terminal velocity a function of the shape of the cyclist (i.e. of R)?
   - Who has the largest R, Stan Laurel or Oliver Hardy?

2.4. Kahoot test before starting the activity

Fig. 4 shows the four questions set using the Kahoot application [14] before (B) the activity. Students had a limited time of 60 seconds for answering questions B1 and B2, and 30 seconds for questions B3 and B4.

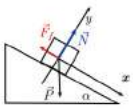
Figure 4
The Kahoot quiz set before the activity

B1) One of the projections of the weight P is



(a) $P_x = mg\cos\alpha$
(b) $P_x = mg\sin\alpha$
(c) $P_y = mg\sin\alpha$
(d) It can't be answered, because the angle is not drawn.

B2) The correct equation for the system according to the force diagram is



(a) $N = \mu F_f$
(b) $ma = mg\sin\alpha - \mu mg\cos\alpha$
(c) $N = mg\sin\alpha$
(d) $N - \mu mg\cos\alpha = 0$

B3) Aerodynamic friction is
(a) parallel to velocity and in opposite direction
(b) negligible in the case of cyclists
(c) proportional to the normal of the weight
(d) proportional to the normal force

B4) The concept of "terminal velocity" is related to the fact that
(a) at that speed acceleration is null
(b) speed is null beyond the area where motion is defined
(c) one can not define an acceleration above that velocity
(d) speed can not be larger than that value

2.5. Kahoot test after solving the activity

Fig. 5 shows the four questions set using the Kahoot application after (A) the activity. We note that the questions are related to the concepts treated in the test before the activity (see *Fig. 4*) and therefore can be used to check whether students have improved their understanding on the subject after the activity. All questions had a time limit to answer of 30 seconds except for A3 for which the time limit was 60 seconds.

Figure 5
The Kahoot quiz set after the activity

A1) Aerodynamic friction may be written as
(a) $F_a = -kv$
(b) $F_a = -\mu mg\cos\alpha$
(c) is never zero
(d) $F_a = kv$

A2) The concept of "terminal velocity" (v_T) is related to the fact that
(a) acceleration is null when $v = v_T$
(b) acceleration is null when $v > v_T$
(c) speed is never lower than that value
(d) acceleration is null when $v < v_T$

A3) The equation for the cyclist is written as
(a) $ma = mg\cos\alpha - \mu mg\sin\alpha - kv$
(b) $ma = mg\sin\alpha - \mu mg\cos\alpha - kv$
(c) $ma = -kv$
(d) $mg\sin\alpha = kvm$

A4) How do you rate the problem of Laurel & Hardy, as a tool to review the concepts of forces?
(a) Very useful
(b) Useful
(c) Not useful
(d) A waste of time

3. Results

This activity has been performed with students enrolled in the degrees of Physics, Electronic Engineering and Mathematics and in the double degree in Physics and Electronic Engineering during the last two academic years, 2017/2018 and 2018/1019. Each academic year the students had the possibility to choose the language for taking the subject between Basque or English. Therefore, students were distributed in two different groups and lecture rooms according to the language chosen. However, the two groups advanced in parallel and exactly the same course methodology was followed in both groups: they used the same handouts and exercise lists, they performed the same activities during the lectures, the same Mooodle quizzes at the end of each topic, and they took exactly the same exam. For this reason, we have analysed a single sample composed by all the students from both academic years and both languages, which amounts to 224 students.

Tables 1 and *2* show the percentage of students that chose each of the proposed answers to the Kahoot questions before (see *Fig. 4*) and after (see *Fig. 5*) doing the activity, respectively. The correct answer to each question is marked in bold face except for A4.

Table 1
Results of the Kahoot quiz before the activity

	a	b	c	d
B1	14.1	76.1	7.8	2.0
B2	6.3	60.5	15.6	17.6
B3	87.9	2.7	5.4	4.0
B4	43.0	2.8	7.5	46.7

Table 2
Results of the Kahoot quiz after the activity

	a	b	c	d
A1	81.8	4.1	1.4	12.7
A2	70.9	21.5	1.3	6.3
A3	19.6	78.1	0.0	2.2
A4	75.8	13.2	1.3	9.7

Question B1 involved vector decomposition using basic trigonometry and B2 was related to the application of Newton's second law. Both concepts are high-school level concepts, which were answered correctly by 76% and 60.5% of the students. Although not bad, this was a bit disappointing for the lecturers. The third question (B3) was a "text" question in the sense that it did not involve any mathematical equation and was answered correctly by nearly 88%. Still, it is surprising that answer (b) was chosen by a few students when the toy-model they were supposed to read at home explicitly stated that the more elaborated model took into account aerodynamic drag. Answer (c) does not make any sense either. Finally, in question B4, which referred to the key concept needed to solve the problem, only 43% gave the correct answer. In fact nearly 47% of students chose answer (d) which clearly is not an answer given by chance, and therefore shows a clear misunderstanding about this concept. This was the only new concept they had to revise at home which, together with the fact that no student came to office hours to ask any question while preparing the activity, makes us think that maybe they didn't work hard enough during the preparation.

All the concepts revised in the Kahoot quiz before the activity were then reformulated in the second quiz before the lecturer solved the exercise in the blackboard. Question A1is

related to question B3. However, instead of using a "text" question, the mathematical formalism for the aerodynamic friction force was used. In this case the result was slightly worse since 82% answered correctly. In fact 12% gave the same answer but with the opposite sign, which shows the difficulty some of the students have when using maths to do Physics. Question A2 asks again about the terminal velocity which was treated in B4. It is clear now that after doing the activity a significant progress was made since 71% of the students got the correct answer, a significant improvement over the 43% who answered correctly before. Nevertheless there is still a 21% of the students who points to an incorrect answer, showing that more stress needs to be made on this concept. Question A3 involved the concepts dealt with in B1 and B2. The result is very similar. It is again surprising that nearly 20% continue making mistakes in vector decomposition. Finally, the last question (A4) was just designed to test the willingness of students towards these activities. This shows that 90% of the students found the activity useful or very useful.

During the activity and while students were working in teams, we noticed a good dynamics within the groups: students discussed their ideas and even explained each other unclear issues. They didn't ask too much to the lecturers, but the few questions they did showed that they did not read thoroughly the material before the activity, since these were questions related to things that they were supposed to have read or revise. This improved in the second academic year, most likely because the lecturers insisted more on the importance of coming well prepared to the activity. At this point we do not really know how to motivate the students to read and take seriously the previous work that needs to be done before an activity like this. Its evaluation for the final mark of the subject may be a way, but using the evaluation as a motivation or menace does not sound good to us. In the long term we think it will be counter-productive.

At the end of the session and after the lecturer corrected the exercises in the blackboard we asked whether they though it was a difficult exercise. Most of them agreed that it was easy and that they had not worked hard enough. They also mentioned that it was a useful exercise that made them realize how they should work and what their weaknesses are.

All in all the lecturers were happy with the result and they will continue designing activities like this in the future.

4. Summary, Acknowledgements and References

The PBL activity presented here was meant to complement other activities with the aim of motivating students in a first year Physics subject and encouraging them to work on a regular basis. The problem suggested to the students was given in advance and it included two short Kahoot quizzes, one before and another one after the activity, which allowed to obtain a quantitative assessment of their learning progress. The problem was solved in teams which stimulated discussion within the team and promoted team-work. Results show that students did not prepare well enough for the session. However the activity improved the understanding of the key concept treated and helped them and the lecturers identifying their weaknesses.

Acknowledgements

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Belbin Team Roles to Enhance Students' Engagement to Project Based Learning in Chemical Engineering

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Abstract

There is a longstanding recognition of the need to incorporate group work projects in higher education curricula. However, learning teams are often dysfunctional leading to disappointing learning experiences. There are several reasons: different motivation, expectations or commitment, personality clashes, dominant and passive members, etc. Cooperative learning is not about simply putting students together in groups, but about providing good facilitation. Well versed in this issue, the instructors of the subject process and product engineering in chemical engineering degree at the university of the basque country UPV/EHU, introduced an education intervention to enhance student engagement in project based team-learning: constructing student groups using belbin's role theory for the task to design an industrial chemical process. Belbin categorized individual behaviour within the team into nine roles, grouped into 3 categories: mental roles (plant-monitor evaluator-specialist), social roles (resource researcher-coordinator-teamworker) and action roles (sharper-implementator-finisher). The central claim of the belbin's role theory is that a 'balanced' team, build up by selecting individuals that covers all nine roles, has a greater propensity to perform highly. An individual's natural team role preferences are rapidly identified through the belbin self-perception index and 4-6 observers' assessments. This personal information will allow reinforcing each student's self-concept, as they recognize the natural teamworking skills they can bring to the team, which is key for the complementarity in team-working, independently of their previous academic grades. Beforehand, it is crucial to perform experiential sessions to glimpse the high number of non-technical and innate abilities that allow to successfully reaching a team challenge. After the intervention, the students have shown (through a questionnaire) an increase in their motivation, which is also reflected in a better functioning of the teams analysed through the individual accountability factor and the enhancement of their academic grades.

1. Introduction

1.1. Background

One of the most important elements of the Project Based Learning (PBL) methodology is the cooperative learning (CL), that is, the learning experience of small groups, oriented to the solution of the problem. Cooperative learning aims to get the student to acquire also attitudes and positions oriented to teamwork, essential in the professional environment of the 21st century. Small-group teaching and learning by means of Problem Based Learning methodology has achieved an admirable position in medical education as a means for increasing student's interest, teamwork ability, deeper retention of knowledge and skills, and improving the self-directed learning [1]. In medical schools, up to ten students work together facilitated by a tutor during PBL tutorial sessions. In engineering education, where the enrolment and class size is high (50-100), the CL element of the PBL implementation is difficult to monitor, because usually a sole teacher is in charge of all students, so each group of students tackle the problem in a self-directed way without tutoring [2]. Under conditions, even though students may be assigned to groups in PBL, they do not automatically develop

team working skills. In fact, without proper support, the problems may arise in the small groups resulting in an unpleasant learning experience [3,4], especially if students have little experience in PBL and CL lecture-based teaching is generalized. Then, ensuring the proper functioning of teams is crucial to increase students' motivation and learning effectiveness.

We found same difficulties when implementing PBL methodology in the subject Process and Product Engineering (9 ECTS credits, 5th semester) of the Chemical Engineering Bachelor Program at the University of the Basque Country (UPV/EHU). The first 4.5 ECTS are focused on learning strategies for the design of chemical processes. PBL has been chosen as the best teaching-learning methodology. The driving force of the subject is a project focused on the development of a base-case design of an industrial chemical process, i.e., the production of cumene [5]. The project is divided into different synthesis steps, as described by [6], where each step corresponds to one milestone and its corresponding deliverable: (1) Literature Survey, focused on the state of the art of the process; (2) Reactor Design and Simulation; (3) Separation Processes-Process Overall Design; (4) Heat Integration and Heat Exchanger Network Design; and, (5) a final report in which Economic and Profitability Analysis are included. Although the final report covered all the learning outcomes to be summatively assessed, students received feedback and formative assessment after finishing each deliverable, which helped students check for understanding throughout all the learning and project design process. 70 students enrolled in this course divided into two main groups: one group is taking the course in Basque language (Euskera) and the other in Spanish.

We have designed the cooperative activities and tasks in such a way that they meet the five basic elements reported by [7]: (1) positive interdependence, (2) individual and group accountability, (3) face-to-face interaction, (4) interpersonal skills, and (5) group processing. All the ingredients are important, but the most difficult to achieve are (1) and (2) [8], that is, the contribution of all the members is necessary to successfully complete the group's task, and no member can ignore the work of the colleagues and only focus on one part of the work. Among several strategies proposed in the literature to ensure both [2,9] we applied the following [10]: (1) training sessions on teamwork based on jigsaw and team game tournament, (2) keeping the size of the group small (5 members) according to task difficulty and dimension, (3) define rotatory group's spokesperson, and, (4) develop and monitor questionnaires for individual accountability. Even so, some groups did not work properly, which caused problems; and, thus, a lower success index than expected. The most plausible hypothesis could be the inappropriate group composition, since the students created their own groups according to their personal preferences [10, 11].

1.2. The innovation

Engineering design team members typically have their own area of (design) responsibility, are often dependent on the work of other members, but are also working towards the common goal of completing the design project [12]. Many theories have been expounded about the selection of team members and the optimum size for teams. In engineering education the most common methods used in team building are [12]: the Myers-Briggs Type Indicator (to identify an individual's psychological type preferences), the Belbin Test (to identify the role that an individual may fulfill in a team) and the functional approach (to identify and provide the necessary skills). Accordingly, we asked students, who had completed the PBL experience formerly, to reflect on the different types of skills needed within the team to successfully complete the project. We found that many of these skills correspond to the roles of Belbin's theory [13].

Belbin defines a team role as "a tendency to behave, contribute and interrelate with others in a particular way" [13]. Belbin roles describe a certain type of behavior that characterizes an individual's behavior with respect to others in a team focused on facilitating team progress and efficiency. The real value of Belbin team-role theory rests in both individual and the team being aware of all its members' roles and using that information to help manage the team and to deal with external parameters. An individual's Belbin team role is not fixed and people can consciously change their behavior in a team environment [12]. Belbin categorized individual behavior within the team into nine roles, grouped into 3 categories [14]: mental roles (Plant-Monitor Evaluator-Specialist), social roles (Resource Researcher-Coordinator-Teamworker) and action roles (Sharper-Implementator-Finisher). The central claim of the Belbin's role theory is that a 'balanced' team, build up by selecting individuals that covers all nine roles, has a greater propensity to perform highly.

We also found the team size of 5 was within the range (5 to 9) for the best team performance [15]. As the team size increases the team becomes unmanageable and when the size decreases below 5 the desired natural (Belbin) team role and functional skills cannot always be covered.

The aim of this work is to analyze whether it is possible to introduce role interdependence in group dynamics by selecting group members using Belbin's theory in order to enhanced students engagement to the PBL group.

2. Methodology

Balanced groups were formed according to the following stages:

1. Before 18/19 academic year instructors received training in Belbin's Roles Theory from Belbin Associates.
2. An awareness session to help teams communicate and recognise their different contributions. Randomly formed teams were required to form a strategy to "rescue a rocket" within a short timeframe, out from a circular carpet (mood) by using only some ropes of different size. It followed a discussion session to analyze skills and roles used in the exercise.
3. Individual team roles were assessed using the Team Role Self Perception Inventory (TRSPI) and the Observer Assessment Sheet (OAS) provided by Belbin-GETSET. The TRSPI is composed of seven sections with 10 items in each one, where the nine Belbin's roles are represented except for one, which assesses social desirability. Students distributed 10 points between the statements according to the strength in which they feel the statement reflected their own behavior. Given the concerns over the validity of the self-perception [14], OAS was also fulfilled by 4-5 co-workers who knew an individual well. It is a 72 item peer-rated checklist divided into two parts, which contains 45 positive and 27 negative adjectives, respectively. Observers ticked (one or twice) the adjectives which better suited the individual's behavior. With this information Belbin GETSET generated individual reports, which summarized the percentage distribution of their 9 roles. Instructors formed the groups (4-5 members) taking into account primary/natural (>70 points) and secondary (30-70 points) team roles [14].
4. Session for Belbin's role theory analysis. Using the jigsaw technique students analyzed team role descriptors, strengths and weaknesses.

5. Students received their individual reports and were asked to complete a written critical reflection of their roles, focusing on their strengths and weaknesses by giving real examples. They also received instructors' feedback to encourage them.
6. Finally, instructors notified the team groups formed. Members were asked to enter their names in the segments that correspond to their top two Team Roles. The circle gives an overview of the Team Roles present in the team.

3. Results

The impact of the Belbin's role intervention was assessed by 4 different ways:

3.1. Observation based results

In the first stages of the intervention (training sessions, completing a self-perception GETSET Inventory and analyzing individual report of Belbin's roles) the attitude of the students was expectation and excitement before the novelty. They also accepted with enthusiasm their teammates selected by the instructors. It must be noted that students receive generally lecture-based teaching and other instructors form teams by allowing students to self select (as we do formerly), alphabetically or randomly.

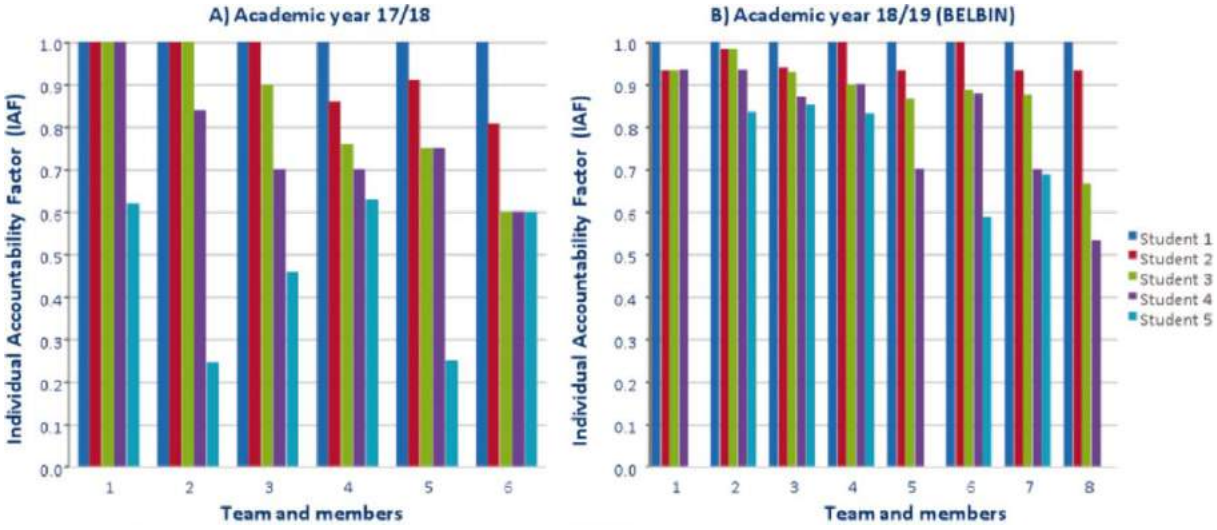
The written reflective analysis carried out by each student on the results of Belbin test showed that approximately 70% felt identified with the resulting combination of Belbin's role. Some provided concrete evidences in relation to their roles in other team experiences, not necessarily academic. This allowed the teachers knowing our students more deeply, including their non-academic interests and skills. The teachers felt that the students' motivation for the new approach to the PBL project was higher than in previous years. We tried to reinforce this high motivation with constructive feedback to their reflective analysis.

Due to the high number of students and the limited school time, it was not possible to carry out an exhaustive and personalized follow-up with the groups on Belbin's roles in teamwork. Alternatively, teachers carried out this task with short interviews with the teams during the sessions dedicated to the development of the design project. Overall, the students were able to quickly identify the roles that each member was performing. Mostly, it coincided with their preferred roles and sometimes with their assumable roles, but never with non-assumable roles.

3.2. Individual accountability factor

We formerly reported a method to evaluate individual accountability in CL activities, such as PBL [10]. It consists on submitting students to monitoring questionnaires (MQs) in order to verify that each student knows the essential aspects of the team project. Students answered these questions immediately after finishing each deliverable of the design project. Figure 1 shows the Individual Accountability Factor (IAF), calculated as the average of the scores obtained in the MQs divided by the highest averages in the team [10], of each student within the groups for 17/18 and 18/19 academic years (without and with, Belbin's role intervention, respectively). Overall, the IAF of all the members of the different teams is higher and more homogeneous with Belbins's role intervention (18/19) than without it (17/18). This reflects cohesion and engagement of team members has increased, and then the positive interdependence has enforced.

Figure 1
IAF distribution within the groups for 17/18 and 18/19 academic years



3.3. Academic grading

The course assessment for the first 4.5 ECTS is divided into three components, which are the project (60%), a final individual examination (33%) and individual quizzes (7%). The individual final examination aims to assess individually the degree of ability to achieve the learning outcomes, previously and presumably achieved by the group during the development of the project design.

Figure 2
Grading distribution for the academic year 18/19 after Belbin's role intervention in comparison with the grading distribution for previous academic years, from 13/14 to 17/18

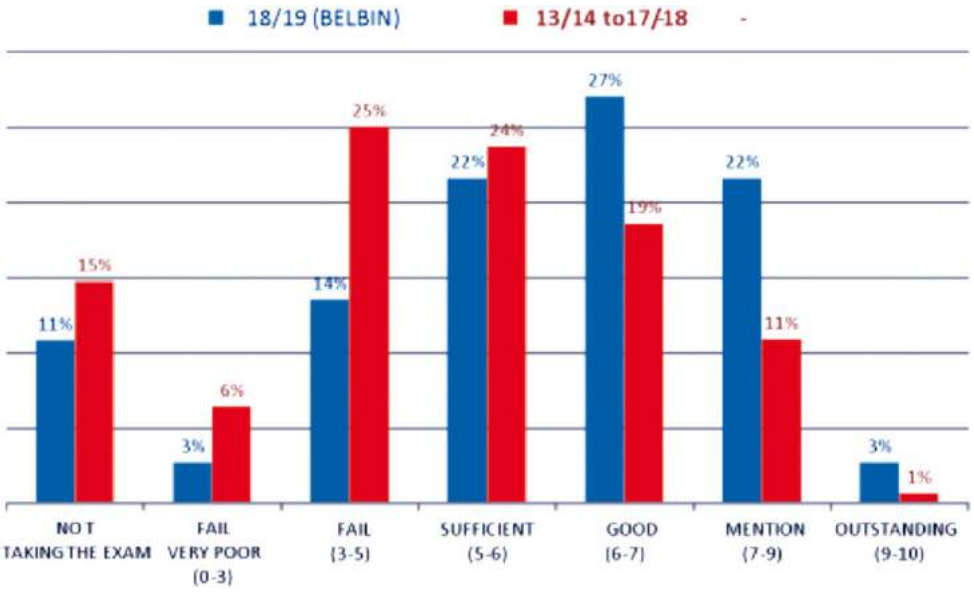
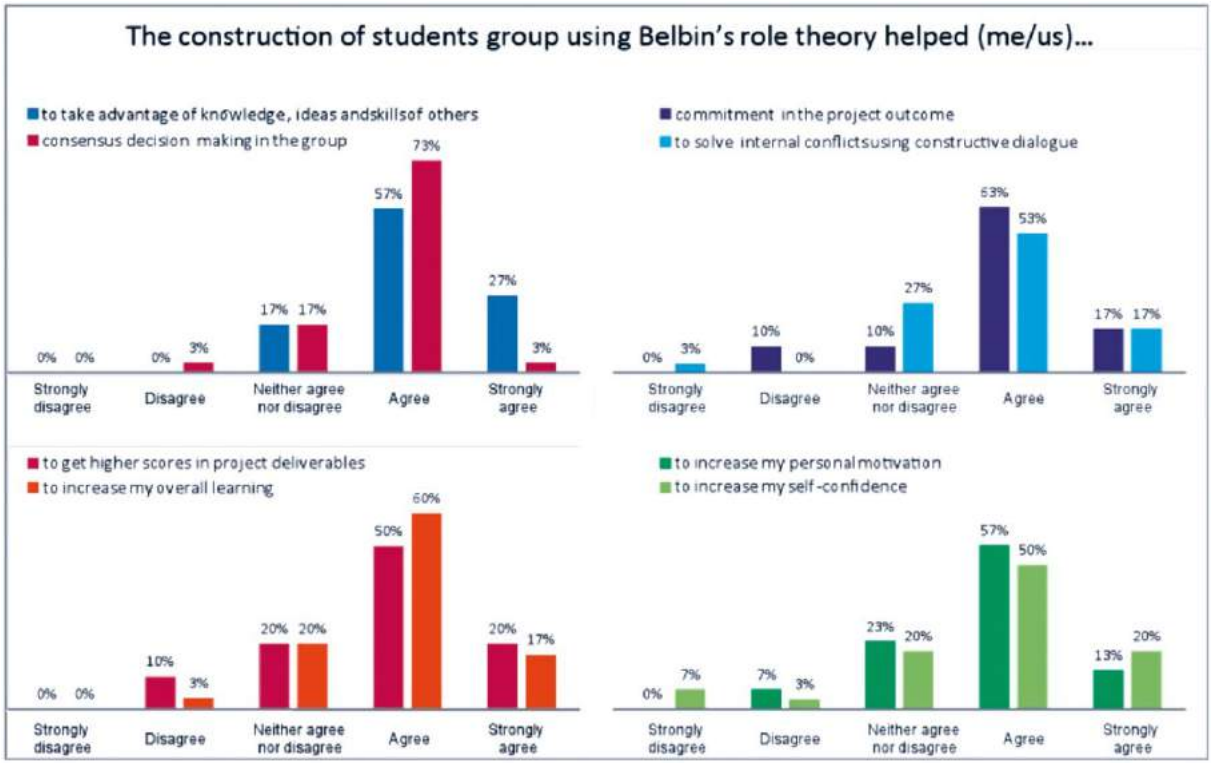


Figure 2 shows the grading distribution for the academic year 18/19 after Belbin's role intervention in comparison with the grading distribution for previous academic years, from 13/14 to 17/18. These results correspond to the group taking the course in Euskera, since same instructor (A. Aranzabal) was teaching the subject for all this time, which allows to reduce the effect of the instructor.

Besides improvements in teamwork performance, the Belbin's role intervention resulted in better final grades, both in the individual examination and in the subject as a whole. The number of students not taking the exam and not passing it decreased significantly, while the number of students with "pass" and "mention" grades increased. This seems to be related to the initial higher motivation which have encouraged for teamworking, leading to a more significant learning.

Figure 3

Students' opinion on 6 of the items selected from the opinion survey about the influence of using Belbin's role theory to construct the groups on the personal and team experience

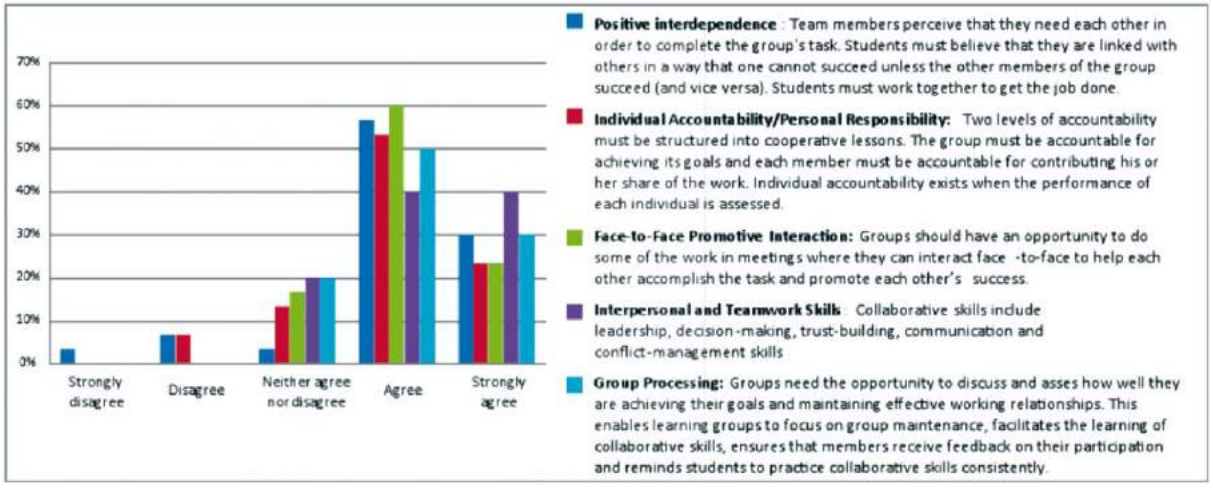


3.4. Students' experience and opinion

Students' experience and opinion was collected by means of a Likert scale opinion survey (1 — strongly disagree, 5 — strongly agree) of 29 items. Students' answers allowed us to assess their perception on the effectiveness of Belbin's role intervention to promote positive interdependence and engagement to teamworking. Figure 3 shows students' opinion

on 6 of these items. Students were also asked to grade with Likert scale the five ingredients to become a real cooperative team. 80% of students agree or strongly agree that the cooperative learning ingredients have been present in their teamworking performance (Figure 4).

Figure 4
Students' opinion about the incorporation of 5 elements of cooperative learning into their teamwork



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Avanzando en una docencia con perspectiva de género

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Abstract

From various academic, institutional and/or activist approaches, the concept of gender friendly enviroment has become popular, to characterize spaces, in our educational case, in which we establish a series of tools that allow to incorporate the gender perspective. Within the framework of the educational Innovation Project of the UPV-EHU, *Docencia con perspectiva de género en los grados de la Facultad de Ciencias Sociales y de la Comunicación*, we are working on tools to advance these logics based on seduction strategies to the importance of the consideration of differences in gender treatment in achieving egalitarian education.

We propose to present a tool of approach to the gender that starts from an analysis of the reality settled in what exists and not so much in what we would like to exist. Thus, the data of the faculty indicate the existence of a significant percentage of students sensitive to these issues. To this percentage is another group even more important that although not make visible the impact of gender in their curriculum development, it is highly responsive when it comes to having tools for analysis with a gender perspective.

So things should be established strategies that analyze the plural reality of the classroom, in order to detect varied strategies that empower "related persons" and are able to attract the various types of "absent persons".

After proposing 1) strategies of analysis of the reality (sociograms of affinity to the question), 2) a methodology to approach the gender supported by the experience of the students, taking advantage of various techniques that allow them and themselves experience the negative consequences of gender stereotypes. In addition to this logic settled in an experiential approach 3) we will present tools to ensure in group work in the classroom from the consideration of the various group roles and their associations to one or the other gender, balancing the weight of public visibility and the work of reproduction of the group to both genders. Finally, 4)we'll identify a series of ex ante and ex post evaluation tools with a gender perspective.

Resumen

Desde diversos acercamientos académicos, institucionales y/o activistas se ha popularizado el concepto de *gender friendly enviroment*, para caracterizar espacios, en nuestro caso educativos, en los que se establecen una serie de herramientas que permitan incorporar la perspectiva de género. En el marco del Proyecto de Innovación Educativa de la UPV-EHU *Docencia con perspectiva de género en los grados de la Facultad de Ciencias Sociales y de la Comunicación* estamos trabajando herramientas que permitan avanzar en estas lógicas asentadas en estrategias de seducción a la importancia que tiene la consideración de las diferencias de tratamiento de los géneros a la hora de lograr una enseñanza igualitaria.

Proponemos presentar una herramienta de acercamiento al género que parta de un análisis de la realidad asentado en lo que existe y no tanto en lo que nos gustaría que existiese. Así, los datos de la Facultad indican la existencia de un porcentaje importante de alumnado sensible a estas cuestiones. A este porcentaje se otro grupo aun más importante que aunque no visibilizan el impacto del género en su desarrollo curricular, es sumamente receptivo a la hora de contar con herramientas de análisis con perspectiva de género.

Así las cosas, se deben establecer estrategias que analicen la plural realidad del aula, a fin de detectar estrategias variadas que empoderen a "las personas afines" y sean capaces de atraer a los diversos tipos de "personas ausentes".

Tras proponer 1) estrategias de análisis de la realidad (sociogramas de afinidad a la cuestión), presentaremos 2) una metodología de acercamiento al género apoyada en la experiencia del alumnado,

aprovechando diversas técnicas que permitan que ellos y ellas mismas experimenten de forma personal las consecuencias negativas de los estereotipos de género. Además de esta lógica asentada en un acercamiento experiencial, 3) presentaremos herramientas para garantizar en el trabajo en grupo en el aula desde la consideración de los diversos roles grupales y sus asociaciones a uno u otro género, equilibrando el peso de la visibilidad pública y el trabajo de reproducción del grupo a ambos géneros. Finalmente, 4) identificaremos una serie de herramientas de evaluación *ex ante* y *ex post* con perspectiva de género.

1. A modo de introducción

En esta comunicación se recogen algunas propuestas prácticas para comenzar abordar la inclusión de la perspectiva de género en la docencia universitaria. Dichas propuestas han sido pensadas y diseñadas en el contexto de un Proyecto de Innovación Educativa denominado *Docencia con perspectiva de género en los grados de la Facultad de CCSS y de la Comunicación: diagnóstico y propuestas para avanzar*, en el que seguimos trabajando. El logro de los objetivos ha necesitado de una estrategia metodológica plural. En una primera fase, ya finalizada, y con el fin de lograr identificar, analizar y medir el grado de integración de la perspectiva de género en el diseño curricular, hemos utilizado técnicas cuantitativas: análisis de contenido del curriculum de los cinco grados, y encuesta a administrar al alumnado y profesorado. En una fase previa se ha trabajado desde una perspectiva metodológica cualitativa; la discusión de grupo se ha considerado la más idónea para lograr identificar, conocer y detectar las representaciones sociales y los sentidos que el alumnado atribuye a las desigualdades de género. Así mismo, para diseñar propuestas y estrategias de mejora en los grados del área de ciencias sociales, hemos trabajado y continuamos haciéndolo desde la Investigación Acción Participativa, cuya praxis investigativa facilita la inclusión de otra herramienta fundamental como es la enseñanza cooperativa. En el desarrollo de esta IAP se enmarcan dos talleres de formación de profesorado que hemos impartido en enero y junio del año en curso, dirigidos a profesorado con sensibilidad previa en materia de género que necesita reflexionar colectivamente sobre la mejor manera de superar una visión androcéntrica de la docencia, tanto en las formas, como en los contenidos y en las prácticas. Estas sesiones han sido concebidas como espacios de aprendizaje colectivo entre las personas participantes, elevando una preocupaciones a las que haremos referencia más adelante al contextualizar las prácticas propuestas.

2. El género en la práctica docente universitaria

Como docentes nos corresponde contribuir a la formación integral de nuestro alumnado, desarrollar sus capacidades, talento y juicio crítico, ofreciéndoles ideas que les permitan comprender la complejidad de la vida social y afrontar los problemas de la vida cotidiana. Somos, pues, agentes transmisores de conocimiento y valores, pero también agentes de socialización que reproducimos las normas y la cultura de la sociedad en la que vivimos, y en la que hemos sido socializados de forma diferente en lo que al sexo/género se refiere. Esta socialización diferencial implica una asignación de estilos cognitivos, conductuales y actitudinales, así como códigos morales y normas estereotípicas según el género asignado a las personas, que produce una asimetría de poder que privilegia a los hombres sobre las mujeres. Estos estereotipos de género que atribuyen características y comportamientos "típicos" a los hombres y a las mujeres (sexo) a partir de la distinción entre lo masculino y lo femenino (género) contribuyen a mantener las desigualdades entre hombres y mujeres.

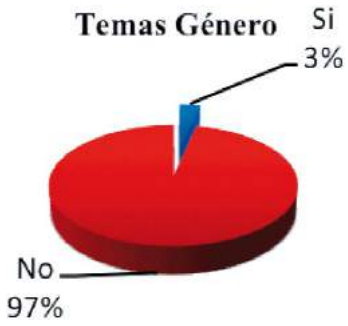
La mayoría de las y los docentes creen que tratan de forma equitativa al alumnado en el aula, sin embargo tendemos a reproducir esa socialización diferencial introduciendo de forma inconsciente sesgos y estereotipos de género en todas las dimensiones de nuestra práctica educativa, tanto en las cuestiones más formales (el curriculum, por ejemplo), como en las relacionales (estilos de interacción comunicativa, comportamiento en el aula o expectativas educativas). El alumnado a su vez reproduce en sus interacciones en el aula y fuera de ella esos estereotipos, también de forma inconsciente. Introducir la perspectiva de género en el proceso de enseñanza-aprendizaje contribuye a deconstruir los estereotipos de género que mantienen las desigualdades entre las y los estudiantes, las y los docentes, en los diferentes espacios de la formación universitaria.

La inclusión de esta perspectiva en la docencia de los grados de la Facultad de CCSS y de la Comunicación de la UPV/EHU se ha producido de forma paulatina en los últimos años y ha sido liderada fundamentalmente por un grupo de profesoras feministas llegando a consolidarse con el Máster oficial de Estudios Feministas y de Género que también se imparte en esta facultad. Pero, realmente ¿hemos avanzado en la introducción de las cuestiones de género en la docencia de los cinco grados que se ofertan en ella?

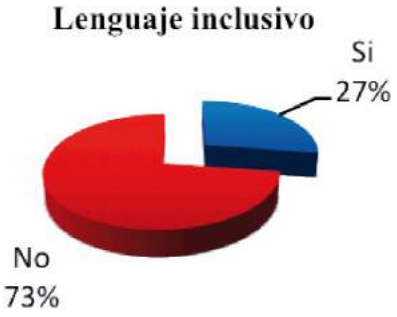
2.1. Diagnóstico del currículum formal

Tras analizar las 310 guías docentes en euskara y castellano del curso 2017-2018 estos son algunos de los datos obtenidos:

En las 310 guías analizadas se han contabilizado un total de 1240 temas ¿cuántos abordan la temática de género?



De las 310 guías 157 corresponden a asignaturas impartidas en castellano, ¿cuántas de ella utilizan un lenguaje inclusivo?



De un total de 3.805 obras citadas ¿cuántas autorías corresponden a mujeres?

¿Cuántas tienen la perspectiva de género?

Estas imágenes no necesitan de palabras que las interpreten.

2.2. Diagnóstico de la pertinencia del género

En el cuestionario administrado a una muestra del alumnado del centro, abordamos la dimensión relacional de la práctica educativa en el aula, con preguntas como: *¿Recuerdas alguna ocasión en la que el profesor o profesora haya realizado comentarios sexistas o haya tenido comportamientos que pudiéramos considerar como tales en su clase?*

Estas actitudes sexistas fueron mayormente de:

Estos comportamientos o comentarios sexistas ¿se producen también entre el alumnado?

Estas actitudes sexistas se producen mayormente:

Finalmente, un 25,5% del alumnado admite que no sabría explicar la razón por la que estos comentarios y comportamientos sexistas se producen, frente a un 38% que sabría explicarlo (el 36% no contesta). Así las cosas, preguntamos a ese 25,5%: ¿Te gustaría entender y, por tanto, poder explicar el origen de estos comportamientos?

El 23% el alumnado manifiesta de forma explícita que le gustaría comprender y poder explicarlo, un 38% sabría explicarlo y el resto está ausente.

3. Trabajo cooperativo con perspectiva de género

Llegados a este punto, a nivel de la Facultad de Ciencias Sociales y de la Comunicación observamos una pluralidad de acercamientos a la cuestión del género, que van desde una mirada ausente (parte del alumnado no considera la relevancia de esta cuestión) a una mirada cercana (presente en otra parte del alumnado, que o bien considera necesaria incorporar esta perspectiva, o bien ya la ha incorporado). Igualmente, se observa que el discurso reactivo a o no existe, o por lo menos no es significativo. No obstante, los talleres realizados con profesorado (de otras facultades) desvelan una lógica no tan coherente a escala de la UPV/EHU. Así, los 5 grados de la Facultad de Ciencias Sociales comparten una serie de elementos curriculares y miradas que difieren mucho de las que se pueden encontrar en grados o Facultades a) más sesgadas en lo que a la participación de uno u otro género respecta (más masculinizadas o feminizadas) o b) que abordan contenidos curriculares en los que la dimensión de género es más difícil de abordar. Así las cosas, a la luz de los debates que han surgido, podemos intuir que el reconocimiento de la importancia de la perspectiva de género a la docencia no solo es plural, sino que en muchos de los casos, puede encontrarse ante potenciales resistencias entre el alumnado.

Es comprensible, así, que a lo largo de la investigación emerja una preocupación compartida por los y las participantes de los cursos formativos. Cómo lograr hacer visible, en la práctica, la necesidad de incorporar esta perspectiva en la docencia, no solo en lo que a la dimensión formal respecta, sino también en relación al currículum oculto. Una preocupación que se comparte con el alumnado femenino participante en los grupos de discusión. Así, estas alumnas destacan el peso que las dimensiones simbólicas y no formales tienen en la relación profesorado-alumnado. Unas dimensiones que adquieren si cabe más relevancia en las interacciones horizontales del alumnado en el marco del trabajo en grupo. Así, el alumnado participante destaca cómo en estos espacios de interacción se generan fuertes desigualdades y prejuicios que afectan al alumnado femenino. Para estas alumnas, la identificación de lo masculino con lo público, lo productivo y lo racional se acompaña del encorsetamiento de lo femenino a lo privado, reproductivo y emocional, que las invisibiliza a la par que sobrecarga de responsabilidades de coordinación.

4. Participación, cooperación y género

En consecuencia, las metodologías más punteras a nivel educativo, aquellas que descansan en el protagonismo del alumnado, deben ser abordadas desde la lógica del género para evitar que lo que se gane en términos de eficacia pedagógica, no se pierdan desde la perspectiva de la igualdad de oportunidades entre alumnas y alumnos.

Así las cosas, la propuesta que estamos trabajando trata de aprovechar las potencialidades de la enseñanza cooperativa, asumiendo la metodología de la Investigación Acción participativa a la hora de incorporar la perspectiva de género. Esta triangulación entre acercamientos participativos, cooperativos y con perspectiva de género es viable ya que comparten una serie de elementos comunes.

— Tanto la perspectiva de la IAP como la de la enseñanza cooperativa asumen el papel de sujeto de los y las participantes, en este caso el alumnado. Igualmente, parten de la premisa de que la clave es un trabajo acompasado, en el que lo relevante no es el avance particular sino el colectivo.
— Si la IAP parte de la premisa del trabajar "muchas y muchos en poco y no pocos y pocas en mucho", la enseñanza cooperativa se asienta en la vinculación de los principios de individuación e interdependencia.
— Si la IAP parte de la premisa de la necesidad del pasar del "qué hay de lo mío" al qué "hay de lo nuestro", la enseñanza cooperativa se asienta en la doble lógica del desarrollo de habilidades interpersonales y de trabajo en grupo;
— Si la IAP necesita de estructuras organizativas, la enseñanza cooperativa necesita interacción cara a cara estructurada.

Antes de profundizar en esta cuestión, las metodologías de la IAP presentan otras potencialidades para la incorporación eficaz de la perspectiva de género al trabajo cooperativo en el aula. Así las cosas, el profesorado participante en los cursos de formación ha señalado como clave, la realización de un buen diagnóstico sobre las posiciones que el alumnado tiene respecto de esta cuestión, a fin de atinar en el diseño de una estrategia que no solo sea válida para los y las convencidas de su pertinencia, sino sobre todo, capaz de seducir a quienes a priori no consideran relevante esta cuestión. Igualmente, las personas participantes consideran que para que esta pertinencia sea considerada, no debe asentarse en el abstracto, sino que debe pilotar sobre otro de los principios de la enseñanza cooperativa, la reflexión grupal.

5. Propuesta metodológica

Si vinculamos los principios y metodologías de ambas perspectivas y los orientamos a la incorporación de la perspectiva de género podríamos plantear una propuesta de abordaje, que al margen de la incorporación o no de la perspectiva de género en el curriculum formal, cuando menos, garantizara la consideración de esta perspectiva en las relaciones en el aula entre el alumnado, en el marco de los trabajos cooperativos. La propuesta consta de una batería de recursos que primero pretenden conocer la realidad, después hacer visible la pertinencia de esta perspectiva, y finalmente permitan una reflexión colectiva posterior.

5.1. Conocer la realidad

En cualquiera de los grados se puede hacer una encuesta inicial (temática, o en la que la cuestión del género solo sea una de las variables analizadas entre otras) que nos permita cuantificar el número de afines, ausentes y adversarios/as a la cuestión. Esta información es fundamental para modular (y acertar en) la profundidad con la que plantear la incorporación de la perspectiva de género. La clave, aquí, no es considerar a los y las afines, sino detectar el número de ausentes, para establecer estrategias que les hagan ver la relevancia personal, académica (y también social) de esta cuestión. Y considerar que un mal diagnóstico puede hacer que algunas personas ausentes se conviertan en adversarias. La información de la encuesta puede ser importante en la fase de cierre, de forma que si se ha hecho un buen trabajo, es probable que el número de personas ausentes haya descendido, aumentando las afines. Igualmente, además de la encuesta, podría ser interesante que el alumnado contestase sobre la asociación de competencias para el trabajo grupal en base a los géneros. Quien tenga una posición que identificamos como ausente, es probable que considere a priori que no hay una relación significativa. Si tras el desarrollo del trabajo en grupo incorporando la perspectiva de género, se pasa de nuevo la encuesta en la fase final, de cierre, es posible que el porcentaje de personas que ven esta relación haya aumentado. En ambos casos, podremos demostrar cómo la incorporación de metodologías con perspectiva de género es relevante y necesaria.

5.2. Visibilizar la realidad

Siendo la clave los y las ausentes, especialmente en grados o facultades en los que es más complicado abordar esta cuestión, es fundamental la realización de acciones que hagan evidente la necesidad de incorporar esta perspectiva al alumnado, no tanto a nivel filosófico o teórico, sino desde la práctica. Proponemos, para ello, comenzar los cursos con lo que en IAP se define como "dinámica de impacto", destinada a fijar la atención. A modo de ejemplo, se propone una dinámica de 2 horas fácilmente exportable a la mayor parte de los grados. La secuencia comienza creando grupos mixtos de 3 chicas y 3 chicos, más algún grupo de control (con alguno de los géneros en minoría). En 6 minutos tienen que consensuar 6 palabras que definan un elemento clave de la asignatura, en nuestro caso la política. Inmediatamente después se les pide que hagan una definición (en este caso de política) con las 6 palabras consensuadas. Tras redactar esta definición, se reparte a otro grupo, que deberá criticar la ajena y defender la propia. Se deja 6 minutos para preparar la argumentación y se inicia el debate. Al acabar la dinámica se pide que respondan a un cuestionario en el que deben identificar quién ha ejercido el rol de secretario/a (escribir las palabras y dinamizar el ejercicio primero; escribir y dinamizar la definición) y el de ponente (preparar ideas para criticar la definición ajena; defender y criticar en público). Se pide que se contabilice el tiempo que han hablado chicos y chicas en cada ejercicio. En el experimento realizado en 1 de Ciencia Política y Sociología, el papel de secretariado recayó en la chicas (100%), que hablan más en el primer ejercicio (60%-40%), mientras que en el segundo la portavocía recae en chicos (100%) quienes hablan más en la preparación de la dinámica (40%-60%). Este experimento se basa en el carácter privado y reproductivo del primer ejercicio, frente a la dimensión pública del segundo, lo que permite trabajar los estereotipos de género, o cuando menos presentárselos al alumnado a partir de la visibilización de su pertinencia en lo que afecta a la distribución de tareas en las interacciones entre el alumnado.

5.3. Recursos organizativos

Uno de los recursos con los que cuenta la enseñanza cooperativa para garantizar los principios de interdependencia, trabajo en grupo y reflexión compartida es la elaboración de un contrato de grupo en el que el alumnado identifique y acuerde las formas de trabajo, los compromisos personales y grupales, así como los posibles problemas a enfrentar y los medios para resolver conflictos. Esta herramienta puede ser utilizada para que se incorpore un apartado (voluntario u obligatorio dependiendo del diagnóstico previamente realizado) que considere la perspectiva de género en las interacciones del grupo. Se trata, así, de una declaración de intenciones que puede empoderar a las personas afines, y seducir a las ausentes.

5.4. Recursos reflexivos

Si en la dinámica cooperativa se plantea la elaboración de un diario del grupo, podría perfectamente plantearse por el profesorado la incorporación de un apartado de reflexión respecto del peso de los prejuicios de género en el desarrollo del trabajo. Si el contrato de grupo es el mínimo para comenzar, el cuaderno de viaje puede ser una buena herramienta en entornos cercanos o abiertos a profundizar en esta perspectiva

5.5. Cierre

El cuaderno de viaje, como vemos, incorpora a todo el proceso la reflexión. Pero necesita de un entorno abierto, que no siempre existirá en todos los grados o clases. En consecuencia, se propone una dinámica de cierre doble. De una parte, al final de la asignatura, como se ha planteado, se podrían pasar nuevamente los cuestionarios iniciales. Así veríamos si las percepciones del espacio de los y las ausentes se han reducido, lo que significaría que se ha logrado disuadir al alumnado de la importancia de considerar la perspectiva de género. Igualmente, podemos pasar el test que pide asociar las competencias grupales (escucha, hablar en público) a los géneros, para ver, nuevamente, si el espacio de las personas ausentes que no ven relación entre ambas cuestiones se ha reducido.

Por último, podría pasarse una rúbrica de tiempos en los que se detallasen todas las tareas que un trabajo cooperativo requiere, y en las que se incluyan también las "reproductivas" (emplazar a reuniones, mantener el orden, levantar actas, hablar con el o la docente), para que cada persona contabilice el tiempo que ha dedicado personalmente, o por géneros en su grupo. De esta forma, se visibilizaría aquello que se ha intuido y es que, si no se ponen medios para evitarlo, en las interacciones en el aula, el género importa.

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Improving feedback with Educational Robots and Visual Programming Environments to Increase Student Engagement in Programming Modules

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Abstract

Learning and Teaching programming skills is challenging both for students and teachers (Gomes & Mendes, 2007; Mihci & Ozdener, 2014). In Computer Science degrees, those skills are covered in various modules, which usually have high failure and dropout rates.

Constructivist approaches, such as Kolb's Learning Cycle (Kolb, 1984), have resulted in improvements of the quality of those modules. Providing the students with formative feedback would allow them to move from the typical trial-and-error process in programming modules to a reflection process on their learning (Edwards, 2004).

Several authors propose to incorporate visual programing environments or physical devices to reduce the problems of novice students in introductory programming modules (Wilson & Moffat, 2010). Those devices can also help providing richer feedback to students (Anfurrutia, Álvarez, Larrañaga, & López-Gil, 2018).

During the last seven years the authors of this paper have carried out different innovations in modules related to programming of the first year of Computer Science degree (Álvarez & Larrañaga, 2016; Anfurrutia *et al.*, 2018). Those innovations have been oriented to the enrichment of the feedback in order to promote student engagement. To this end, Kolb's Learning Cycle has been applied in those modules with the support of visual environments and educational robots.

During this research, students and teachers have filled-in several surveys. Analyzing the answers to the surveys and the students' marks, we have detected evidence on the increase of the motivation of students when using those tools. This has also produced improvements in the percentage of students that take the exams and in the obtained grades.

This paper presents these positive research findings along with a set of aspects that should be considered when trying to deploy a similar experience in programming modules. Those aspects have been derived from the experiences carried out during those years.

1. Introduction

Introductory programming modules are challenging both for teachers and students (Gomes & Mendes, 2007; Mihci & Ozdener, 2014). One of the main problems is the high heterogeneity among students that is produced by several factors. On the one hand, it is motivated by the high failure and dropout rates what generates a high number of resits. On the other hand, some secondary schools have begun to work on computational reasoning (García-Peñalvo *et al.*, 2016), which produces that novice students arrive with diverse prior knowledge levels to these courses. Those differences make difficult to teachers to design adequate learning methods for all students (Leonard, 2002). In order to mitigate those problems, two main approaches are proposed by the literature: to incorporate visual programing environments or physical devices (Wilson & Moffat, 2010).

Another important aspect to be considered is the importance of providing adequate and effective feedback to students. Effective feedback could be obtained providing students

with two kinds of information: verification and elaboration (Shute, 2008). The former indicates whether a program is correct or not, whereas the latter includes aspects that can guide students towards the correct answer (e.g., giving a clue). Verification information can be provided explicitly or implicitly. Explicitly provided information is usually expressed by means of symbols that indicate the correctness of a solution. On the other hand, information provided implicitly includes features such as simulations of programs, which can demonstrate the outcome of the solution proposed by a student.

Visual programming environments and physical devices provide means to simulate or demonstrate in real environments the outcome of programs. Therefore, their use can help to provide implicit verification feedback to students (Anfurrutia *et al.*, 2018).

In this paper, we present the results of some innovative experiences carried out in the introductory programming courses. Those innovative experiences have integrated the use of physical devices or visual programming environments in the frame of Kolb's Learning Cycle (Kolb, 1984) in several ways.

This paper first presents a summary of the carried out experiences. Next, some issues detected during the experiences are presented and some possible guidelines to avoid them are presented. The paper finishes with some conclusions and future works.

2. Carried out experiences

During the last seven years, the authors have performed different innovations with the aim of improving both the learning and teaching experiences in programming modules. Specifically, the experiences have been carried out in two modules (Introduction to programming and Object Oriented programming) of the first year of the Bachelor in Computer Management and Information Systems Engineering at the Faculty of Engineering of Vitoria/Gasteiz at the UPV/EHU.

2.1. Description of the carried out experiences

Four different experiences have been carried out.

- Experience 1: This experience was accomplished in the Introduction to programming module. Students were provided with Lego MINDSTORMS robots which were used during the first 3 weeks. Those robots were used during three academic years with almost 100 students (Álvarez & Larrañaga, 2013, 2016).
- Experience 2: This experience was also performed in the Introduction to programming module. In this case, the Scratch visual programming environment was used during all the semester. 187 students participated in this experience.
- Experience 3: This experience was followed out in the Object Oriented programming module. In this case, two visual programming environments were used: BlueJ and Greenfoot. The programming environments were used during 5 years with 340 students.
- Experience 4: This experience was also carried out in the Object Oriented programming module. It was developed during two academic years and it combined the use of BlueJ and Eclipse with visual simulation environments (i.e. the RobotSim package) of Lego MINDSTORMS robots. 158 students participated in this experience.

Taking into account that the practical situations in which students are actively involved in the knowledge building are more adequate for programming (Lahtinen, Ala-Mutka, &

Järvinen, 2005; Wang, Dong, Li, Zhang, & He, 2012), the Kolb's learning cycle (Kolb, 1984) has been applied in this experiences. This learning cycle has proven to be very useful for learning programming (Yan, 2009). Kolb proposes that for learning to be effective, students should perform a cycle of the four stages shown in Fig. 1. First, students must perform a specific activity (i.e. a concrete experience). Then, they must reflect on the experience in order to be able to conceptualize the theory which facilitates the explanation underlying the observations. Finally, they must apply the theory in new situations.

Figure 1
Kolb's learning cycle

Hence, this learning cycle has been applied for each of the topics in the selected modules for the experiences carried out so far by the authors (Anfurrutia, Álvarez, Larrañaga, & López-Gil, 2016).

2.2. Main results

To analyse the effect of the innovations carried out and the impressions of the involved actors, both quantitative and qualitative methods have been used. The information was gathered using questionnaires where students had to evaluate the used tools and their contribution in the learning process. The marks obtained by the students have also been gathered up. All this information has been statistically analysed to determine whether the innovations have any effects on the students' performance.

Analysing the answers to the surveys and the students' marks, we have detected evidence on the increase of the motivation of students when using those tools. This has also produced improvements in both the percentage of students that take the exams and the obtained grades.

Although the results obtained have generally been positive, some issues have been observed which require to be addressed in order to satisfactorily apply any similar innovation. Those issues are described in the following section.

3. Issues observed and guidelines

The main issues observed in the experiences can be related to four aspects: characteristics of the students, support tool selection, integration in the module and methodological aspects.

There are two main characteristics of the students that have generated differences on the results: gender and students' previous programming knowledge. Differences in the results

according to the gender of the students have been detected. More specifically, women have rated the experience worse than men have. Another latent problem that must be properly dealt with is the previous knowledge difference that students have. In the responses to the surveys, there were remarkable differences regarding the motivation and the acceptance of the tools used depending on the previous knowledge of the students.

Regarding the tools selection, certain difficulties inherent to the use of physical devices have been detected in the experiences. However, physical devices should not be automatically discarded because a greater motivation has been observed with their use than with non-physical environments. It is important to adequately analyse the content of the course and to select the environment to be used accordingly, as there is no single adequate environment for every situation (Hirst, Johnson, Petre, Price, & Richards, 2003).

Another important aspect detected in the experiences is that, in order to achieve greater acceptance by students, the environments must be properly integrated into the course's program development and assessment.

Finally, in order to work with a pedagogical framework such as the one presented in this article and to correctly apply Kolb's cycle, it is fundamental to ask questions to students after doing the exercises, so that students can observe, reflect and find answers on their own to the problems arisen.

In order to address the encountered issues, we propose a set of guidelines to be applied when carrying out similar experiences. Those guidelines are based on our experiences and the bibliography. Each of the guidelines is oriented to answer one of the observed issues as shown in table 1.

Table 1
Proposed guidelines

Observed issue	Guideline
Gender	—Provide different thematic exercises. —Assess whether the selected programming environment might cause problems.
Previous knowledge	—Use different programming environments according to the students' prior knowledge. —Change the programming environment as the students' progress. —Classify provided exercises according to their difficulty.
Physical devices	—Design the exercises taking into account the contextual factors that can affect the physical devices (Álvarez & Larrañaga, 2016).
Visual environments	—Analyse which is better related to the content of the course and the age of the students.
Integration in assessment	—Consider the activities carried out using these environments in the assessment process.
Relate to other modules	—Relate the selected environments to other programming modules.

As main guideline, it can be highlighted the importance of thoroughly selecting the programming environment to be used taking into account the students' characteristics and the contents of the course. The theme and the difficulty of the exercises must also be selected according to the current users' knowledge and interests.

Finally, it is very important to integrate in the assessment process all the work done with those environments and try to relate their use to other modules.

4. Conclusions and future work

The learning and teaching of programming courses are very challenging both for the students and teachers involved in the courses. One of the main problems is the high heterogeneity of students that makes very difficult to teachers to adapt the course's contents to all of them. Richer feedback and constructivist approaches can help to reduce the problems that arise on those courses.

The authors of this paper have been innovating in the teaching and learning of those courses by including visual programming languages and educational robots in different ways in order to improve the feedback and motivate students.

The introduced innovations have improved the student engagement and their scores in the evaluations. The deployment of those experiences has also allowed us to define a set of considerations to be considered when any innovation is to be carried out with the inclusion of those tools.

The results have been very promising and we plan to continue using those tools.

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Competition for the best Formula Dron Project. Will it be able to stimulate the students?

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Abstract

Nowadays, it is very important to improve the motivation of the students in the first courses of the different Degrees of Engineering. To this end, it is essential to stimulate the engagement of students through their participation in the implementation of projects of interest that aim to improve the skills expected to obtain in the Degree. For this reason, the "Formula Dron Project" is launched through the subjects of Economics and Statistics that are taught in the Degree in Telecommunication Technology Engineering at the Bilbao School of Engineering. This initiative has two objectives; on the one hand, to increase the motivation of the students both in the subjects defined and in the Grade itself, mainly in its electronic reference, and, on the other hand, that it serves to be able to show the students of the Bachelor a more real practice of the training obtained in this Grade. In order for the proposed project to be motivating for the students, active methodologies are used and a Problem-Based Learning (PBL) is proposed. The problem is presented to the students as a Competition for the creation of the best "Formula Dron Project", and the detonating question of the method that is presented through a video made by the teachers by Powtoon tool. From this moment on, students grouped into 3-4 people will follow the tasks set out in the student's notebook. In the Economics subject the guidelines to follow for the creation of a company are given, since it has been considered that the implementation of the Project is equivalent to the creation of a company. To this end, different activities are proposed to be developed both inside and outside the classroom, which will be monitored through tools such as Padlet, that allows to carry out a complete feed-back between the groups and the teacher, facilitating the transfer of knowledge between all the parties involved. In the subject of Statistics, we work on the probability of the demand and the short-term states of the economy in order to facilitate the simulation of the profitability of the project through Excel software.

Resumen

Actualmente, es de suma importancia mejorar la motivación de los/las estudiantes en los primeros cursos de los distintos Grados de Ingeniería. Para ello, es fundamental estimular la implicación de los/las alumnos/as a través de su participación en la puesta en marcha de proyectos de interés que tienen como fin mejorar las competencias que se esperan obtener en el Grado. Por ello, se pone en marcha el "Proyecto Formula Dron" a través de las asignaturas de Economía y Estadística que es imparten en el Grado de Ingeniería en Tecnología de Telecomunicación de la Escuela de Ingeniería de Bilbao. Esta iniciativa tiene dos objetivos; por un lado, aumentar la motivación de los/las alumnos/as tanto en las asignaturas definidas como del propio Grado principalmente en su referente electrónico, y, por otro lado, que sirva para poder mostrar a los/las alumnos/as de Bachiller una práctica más real de las capacitaciones que se obtienen en este Grado. Con el fin de que este proyecto sea motivante para el alumnado, se hace uso de metodologías activas planteándose un Aprendizaje Basado en Problemas (ABP). El problema se plantea al alumnado como un Concurso para la creación del mejor "Proyecto Formula Dron", y la pregunta detonante del método que es presentada a través de un video realizado por los profesores usando la herramienta PowToon. Los/las estudiantes agrupados/as en 3-4 personas seguirán las tareas que se plantean en el cuaderno del estudiante. En la asignatura de Economía se dan las pautas a seguir para crear una empresa, ya que se ha considerado que la puesta en marcha del Proyecto equivale a la creación de una empresa. Para ello, se plantean distintas actividades a desarrollar tanto dentro como

fuera del aula, cuyo seguimiento se realizará a través de herramientas como *padlet*, que permite realizar un feed-back entre los grupos y la profesora, facilitando la transferencia de conocimiento entre todas las partes implicadas. En la asignatura de Estadística, se trabaja la probabilidad de la demanda y de los estados coyunturales de la economía con el fin de facilitar la simulación de la rentabilidad del proyecto a través del software Excel.

1. Introduction

The transition to university does not turn out to be an easy task for students, such as, among others, the first year of the Degree in Telecommunications Technology Engineering; if we add to this a basic training composed of subjects more directly related to the degree, which are more motivating to the students, and others that are indirectly related, such as Statistics and Economics, which do not turn out to have the same level of motivation, and therefore the transition becomes complicated. The subjects of Economics and Statistics form part of the 1st year of the Degree and they are developed in the second four-month period. Both present a different subject matter than the rest of the subjects of the degree, since they are the least linked to the area of telecommunications; in addition (or perhaps as a consequence of this), the attitude of the students towards them tends to be less receptive, comparing them with the rest. For this reason, there is a need to improve the approach that is currently being applied to these two subjects, mainly seeking to increase student motivation towards learning the skills that are developed in these subjects, even more by carrying out a learning related to a practical experience of a real case and included in a multidisciplinary project.

The challenge is to integrate innovative approaches into the learning methodology that are able to achieve some competences of these subjects through the development of easy, dynamic and motivating tasks. In this way, learning becomes more fun for them. The use of active and cooperative methodologies is a possible solution to reach the above mentioned challenge. In general, more and more institutions are evolving from classical teaching methods to this type of active methodologies. In engineering education, problem-based learning (PBL) is widely regarded as an innovative method. PBL is an educational approach whereby a problem is the starting point of the learning process (Graaff and Kolmos, 2003). According to Kolmos (Kolmos, 1996) the students discover a professional problem, work realistically and accept it seriously as one's problem to be analysed and solved. Barrows (Barrows, 1986) created the taxonomy of PBL and among its educational goals its define the "increased motivation for learning" (Walker and Leary, 2009). This goal helps student students become intrinsically motivated, and this occurs when students are motivated by their own interest in the task. Different features of PBL support increased motivation for learning, for example, when the students are implicated in personally meaningful task and when they believe that the product of their learning is under their control, among others (Bandura, 1997; Ferrari and Mahalingam, 1998; Hmelo-Silver, 2004). For all these reasons, we have considered the application of the PBL to increase the motivation of students in the subjects of Statistics and Economics in the first year of the Degree.

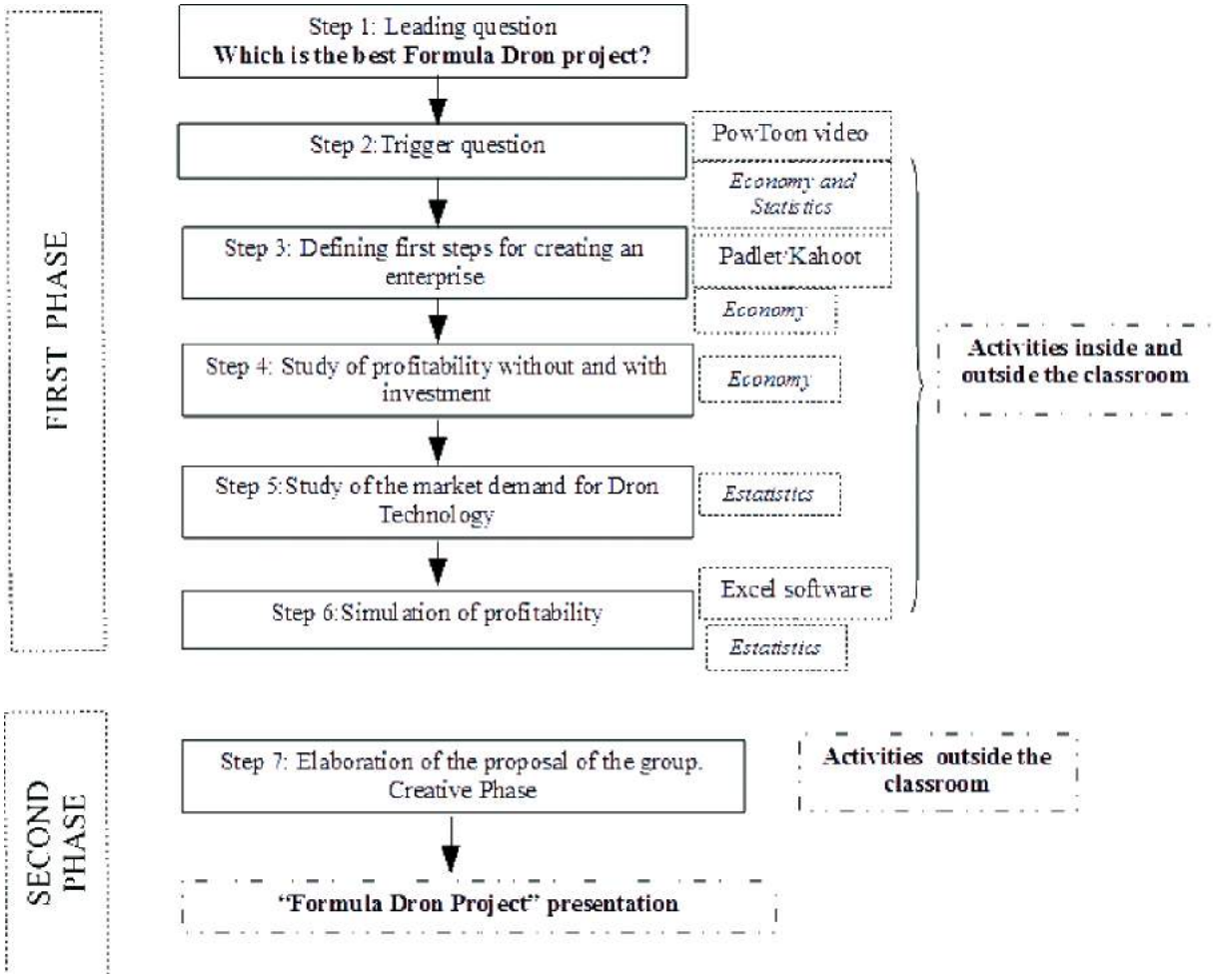
The aim of this article is to introduce the methodology based on PBL used to launch the competition for the creation of a project called "Formula Dron" and to stimulate the students. The project is based on the creation of a company, and the best one presented by the different teams will be awarded, participating in the real project. The need to improve the attitude of Grade students towards it, has led to create a real project to launch a classroom to research and develop Drone technology, whose name will be "Formula Dron".

2. Methodology

The proposed methodology is based on PBL, and the problem is presented as a competition for creating the best "Formula Dron Project", in order to start motivating students from the beginning of the process. To make this possible, two work phases have been defined. In a first phase, the problem is presented and a teamwork is started guided by tasks led by both subjects. In a second phase, the work team with its own autonomy and creativity will define what will be its Formula Dron Project that will compete in the presentation of the projects with the rest of the teams.

Figure 1 presents the methodological process followed to achieve the objective of this multidisciplinary project.

Figure 1
Methodological process approach



In the first phase, we start by presenting the problem through the trigger question. In order to do this, ICT tools are used. The question is presented through a video created with *Powtoon* that is a software to create videos, in order to bring us closer from the beginning to a technological environment that is closer and stimulant to the students. In addition,

through the "*e-gela*" application powered by Moodle, a student's guide is shared in which all the tasks of the first phase are described. The information provided for each task is: the task (description and subject), scenario, duration of the task, evaluation/evidence and the resources to perform it. It also includes a schedule of activities and the rubric of evaluation. Then the work teams of 3-4 people are formed and each group is assigned a name.

Six stages constitute the first phase and during nine weeks, one task is carried out per week and the activities of all this phase are carried out both inside and outside the classroom by each team work created. The trigger question is presented jointly in both subjects, but the tasks of stages 3 and 4 are developed in the economics subject and stages 5 and 6 are developed in the statistics subject. In total, each subject uses six classroom hours (0.6 credits) to guide the corresponding tasks. During the sixth week, a small survey is carried out to evaluate the project.

In order to make tasks more stimulating in Economics, ICT tools are used. On the one hand, the result of the tasks of the different groups is shared through *Padlet* application, thus having a virtual blackboard to transmit information between all and receive feedback from the teacher, consequently facilitating the generation of new knowledge. On the other hand, to know the level acquired by students with the tasks performed, through the web application *Kahoot* launches a set of test questions to answer the moment in class, making use of the gamification technique in order to increase the motivation of them.

The second phase consists of a single step, whose activity will be carried out outside the classroom, and will be decisive for the team since it will act autonomously in the creation of its project, giving free rein to its creativity. This activity will be presented by each team in the last week, and it will be evaluated by the rest of the teams, following the defined rubric. The presentation is a very important phase, as it represents 80% of the evaluation of the problem. The 20% is made up of the work portfolio.

The implementation was carried out from February to May in three different groups, two groups of thirty students and a group of fifteen students, with the participation of five teachers.

3. Results

In terms of results, the first thing to bear in mind is that this project is still in development, so the results are partial.

In terms of tasks, the groups have worked well and have uploaded the activities to the *padlet* application for later treatment in the classroom (see Figure 2).

As regards the evaluation of the project carried out by students in the initial phase, each group has a different opinion of the project.

Figure 3 presents the results of group 1, which shows interest in the activity based on the percentage of students. In general, the students have a medium-low enthusiasm for the theme developed and the activities carried out. As for the guidelines received and the activities carried out, they have had a low acceptance, but with regard to the evaluation of the work team and the relationship between its members, they have a good acceptance. They are generally moderately satisfied with the work carried out by them. In spite of having this type of opinion on the activities, the evaluation of the project and its recommendation on average. In figure 4, the weighted average is defined on the basis of the Likert scale of the different questions. The results show a clear bad score to the guidelines received to carry out the activities.

Figure 2

Contribution to the Padlet: the portfolio

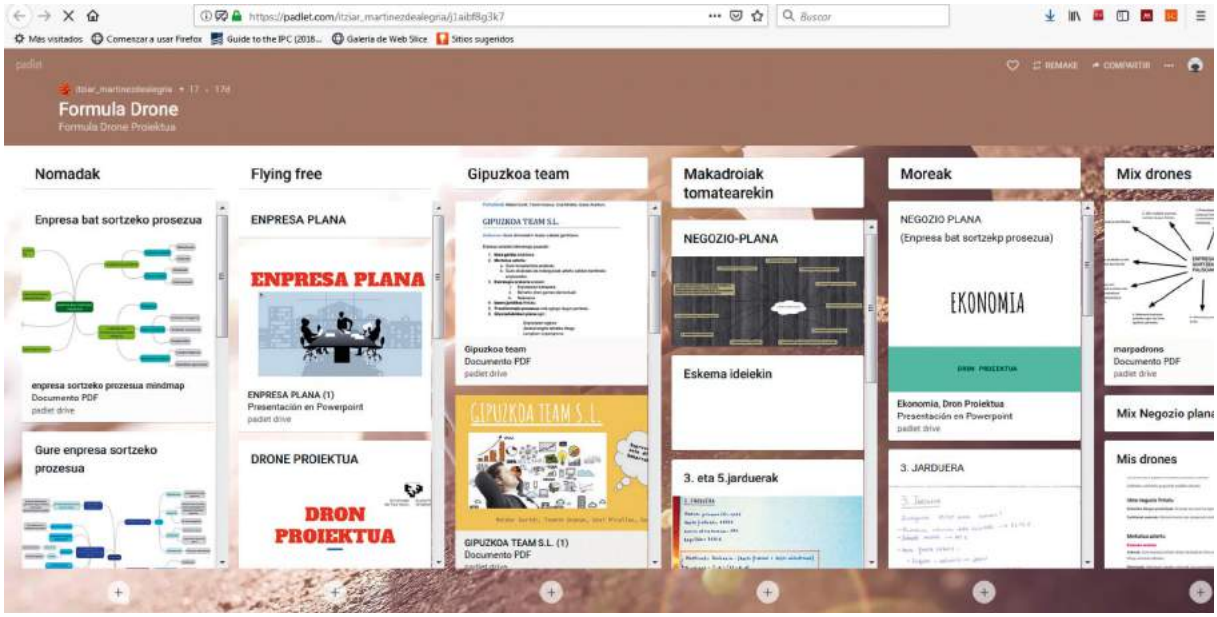


Figure 3

Summary of the opinion results by group 1

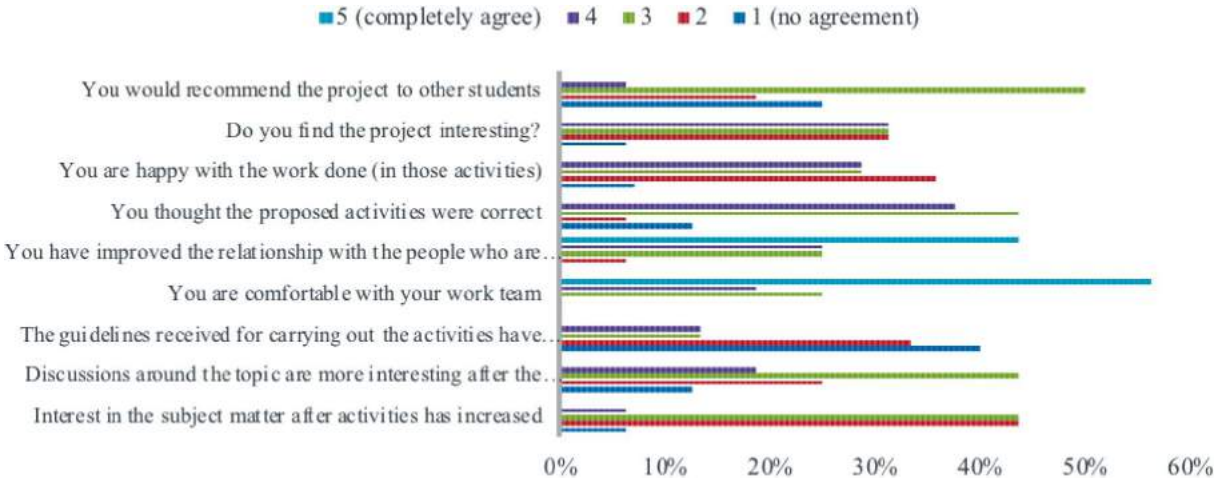
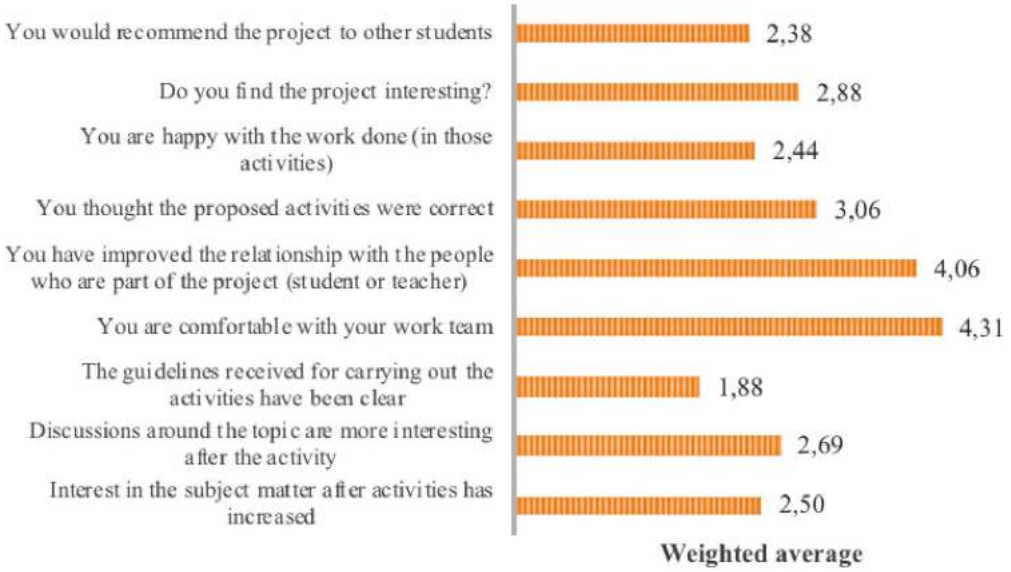


Figure 4
Weighted average of the opinion results by group 1



Group 2 is the smallest group, compared to group 1 and group 31. But their opinion about the activities, the project, the teamwork and the guidelines received is better than in the rest of the groups. Emphasizing that they are generally comfortable with the work done and their teamwork (see figure 5 and figure 6). The worst valued is the interest in the subject after the activities, even so, has a good consideration on the part of the students.

Figure 5
Summary of the opinion results by group 2

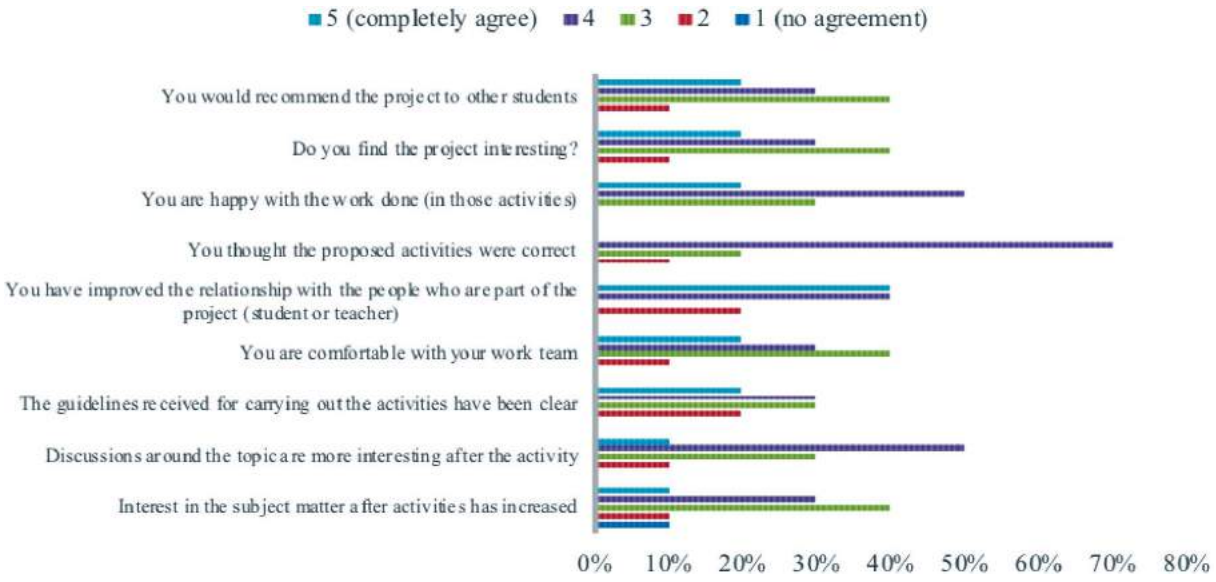
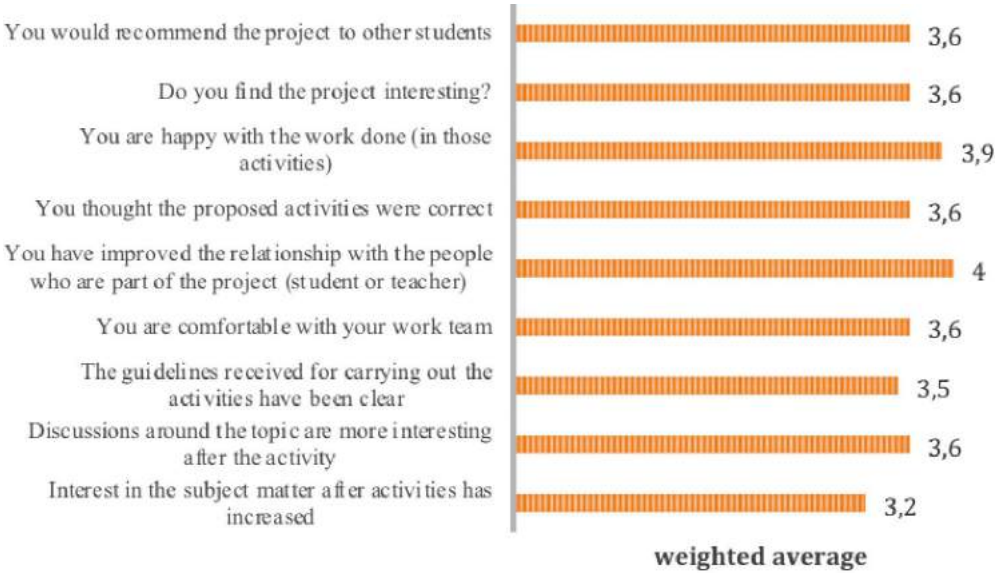


Figure 6
Weighted average of the opinion results by group 2



As far as group 31 is concerned, it has a better acceptance of the activities and the project than group 1(see figure 7). In general, the students have an average enthusiasm for the theme developed and the activities carried out. As for the guidelines received and the activities carried out, they have had an average acceptance. With regard to the evaluation of the work team and the relationship between its members have a good acceptance, as in the rest of groups. In general, they are satisfied with the work carried out by them and they liked the project as if to recommend it. In figure 8, the weighted average is shown and the results show a clearly higher score for the evaluation of the team and its relationships.

Figure 7
Summary of the opinion results by group 31

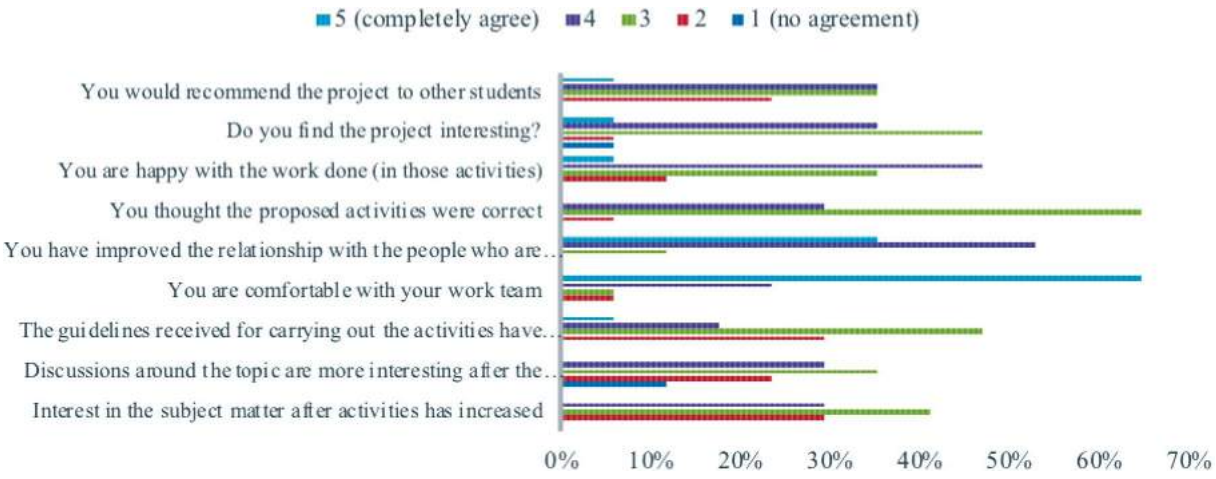
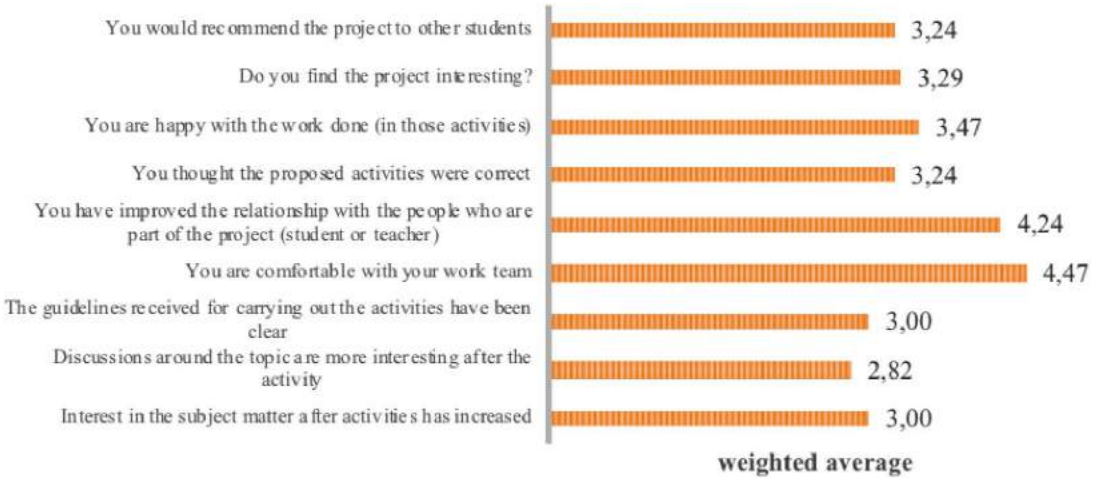


Figure 8
Weighted average of the opinion results by group 31



4. Conclusions

In a subjective way we can conclude that in general the alternative learning method has been very well received by the students. It highlights the good reaction they have had to the use of ICTs in learning, achieving technological competences that are not developed with classical teaching methods. But the opinion survey brings us other results. Highlighting the bad score given in a particular group to the guidelines received to carry out the activities. For this reason, in the opinion survey that will be carried out when the project is presented, a question has been incorporated to indicate whether this penalty is related to the scenarios defined for each task or to the explanation given by the corresponding teaching staff. It is necessary to improve the presentation of the tasks, the involvement of the teaching staff and the coordination of the content based on the defined chronogram; in order for the students to have a clear idea of which is the deliverable of each task and when they have to deliver it.

Acknowledgments

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An integrated Project-based learning approach for a multi-disciplinary engineering design course

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Abstract

Product design greatly evolves for years, due to the increasing complexity of products, from simple monodisciplinary products to mechatronics systems then cyber-physical systems. Development teams of such systems are strongly interdisciplinary and require adequate engineering design methods and common cognitive representations. Teaching such engineering design methods is a high challenge that must integrate several design knowledge domains. Our target is 1st year students of an engineering Master. Traditional pedagogical approach (theoretical class then exercises then practices) are obviously not adapted to actual students that need a high level of stimulation, active implication and operational challenges from real world.

We built a large team of 10 teachers from all required disciplines. We worked to propose an integrated pedagogical framework: built on a project-oriented structure, enriched by 'learning by doing' steps and 'real case study' involving industrial stakeholders. This pedagogical framework is applied to our learning outcomes by implementing a dedicated design process combining system engineering modelling, creativity tools and user-centred design methods. Moreover, we propose to students a case study defined by an industrial partner that follows the students' work.

This approach has been applied for 4 years. We illustrate it by describing the implemented design process, used tools and students' production examples. The case study comes from e-health domain: designing a connected system for home care. As a feedback, we have noticed higher students' involvement and better academic and technical results than involvement and results in previous sessions with traditional pedagogy. After students' work, industrial partners can exploit this work as preliminary studies by selecting best and relevant ideas to design prototypes and new products. Future work is now focused on the flexibility of the course activities using AGILE approach to allow students to define their own path into the learning process.

1. Introduction

Product design is a complex process both at cognitive level and at business level. For [1], "*design is an engineering activity that: affects almost areas of human life; uses the laws and insights of science; builds upon special experience; and provides the prerequisites for the physical realisation of solution ideas*". For a long time, product design required then a limited set of technical knowledge such as mechanics, physical laws, that engineers used to solve problems. Traditional pedagogical approaches, focused on knowledge acquisition and evaluation, were sufficient for a long time: a student was able to work in a company, to adapt itself with former experts and to develop its own experience.

Due to the worldwide competition and the increasing complexity of products, from simple monodisciplinary products to connected mechatronics systems, innovation and customization have brought new sets of knowledge: technical ones as electronics [2] and computing, and 'soft' ones such as project management, ergonomics, users' behaviour, etc. Nowadays several design experts from different disciplines such as mechanics, automation, electronics, software, or IS architects, must work together. As a result, traditional companies intent to manage this heterogeneity with inadequate methods. Efficient coordination and

collaboration are much more challenging than ever to develop products more "connected" and more "intelligent". Students must be in adequation with this industrial context. Moreover, traditional teaching approaches are no longer available [3], as design activity has become a very complex activity: knowledge is a requirement for design and not a result. As teachers we must help students to develop several skills that will allow them to adapt to a company: how to combine several technical knowledge domains? How to adapt students to a specific operational context (specific company, specific product, specific intents)? How to manage the numerous and multidisciplinary stakeholders of design project and how to manage that kind of collaborative project [4]?

Our students are 1st year Master students, involved in a mechatronics engineering diploma. Our intent is to illustrate the transformation that we led to make evolve our pedagogical approach from traditional one to active one [5]. We first analyse how design knowledge and skills have evolved as a requirement to teaching evolution. We then develop our pedagogical approach, then illustrate it.

2. Design Engineering for Complex Products

Design engineering has been based for years on mechanical products, such as methods based on Function-Behaviour-Structure concepts [6], or sequential design processes (e.g. [1]). Considering product as a complex system, with an innovative objective, transforms existing approaches.

2.1. Systems engineering

System engineering [7] is "*an interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, and then proceeding with design synthesis and system validation while considering the complete problem: operations, cost and schedule, performance, training and support, test, manufacturing, and disposal*." [7]. It proposes operational tools to facilitate collaboration between stakeholders, to formalise and share product knowledge in an understandable way, i.e. SYSML formalism, relevant for modelling connected mechatronic products and cyber-physical systems [8]. Different processes are proposed for managing each stage and each activity of the product development process with the aim of sharing same way of working between all stakeholders. Interdisciplinary teams are then working with the same 'language' and the same references. By this way, [9] explains that user requirements are better addressed considering the different disciplines involved in the development process.

2.2. Innovation and User-centred design

Some authors have already identified that user-centred design is a challenge for connected mechatronics systems: [10] for medical cyber physical systems; [11] for industrial cyber physical systems, fostering a better understanding of the completely different forms of interaction between machines and humans, when both are having similar capabilities. However, design engineering methods integrate the user/consumer into design processes and address issues and models that have evolved over the last 15 years. Indeed, Web 3.0 and Internet of Things open the field of possibilities for the consumer: s/he can customize the products to her/his needs and desires. A consequence of this customization introduces a new complexity within

the product design that must go beyond the design of "shape" and must offer an "experience" to the user. So, User Experience, or UX Design, which originally is related to the field of software engineering, finds interest and applications in Product Design [12].

Innovation is also a way to create a competitive advantage. Methods have been proposed to develop a multidisciplinary product with innovation focused on user while maintaining the constraints necessary for the development of these products. In synthesis, the Human Centred Design (HCD) aims to develop a product respectful of user. Thus, designers observe and analyse experiences of use to understand it and improve it. Moreover, the innovation by usage lead to specific design process where the usage is the shared referential between actors.

3. Pedagogical issues for an active engineering design course

3.1. From traditional learning to active pedagogical approach

Initially, teaching design engineering was structured as two different courses: one dedicated to mechanical product and one dedicated to software engineering. Both were based on traditional teaching: a lecture to students (100 at that time), then exercises corresponding to each step of analysis and design steps, from customers needs to solutions modelling, then a limited case study. Students were divided into 4 groups of 25 for exercises and case study.

Several limitations appear after years:

— Evaluations were good but not exceptional, moreover students generally did not reuse learnt knowledge in other courses or projects within companies;
— Students were unable to apply learnt knowledge to products that combine mechanics and electronics, or electronics and computing, or even the three disciplines;
— Number of hours allocated to the case study is not enough for a global application and verifying knowledge and skills acquisition;
— And last, several students were absent during last classes, and simultaneously, number of students increased to more than 200.

For this reason, 4 years ago, we merged the two courses to build a new one and to apply some principles for making students active. We based the course on a project-based learning, as proposed by [13]. The aim was to create a motivating situation, linking students' intellectual implication to real objects (products), to foster them thinking about their project and the to do tasks [14]. Second aim was to avoid previous limitations.

3.2. Project based learning and multidisciplinary design teaching

A project in design is a process structured by several steps. Each step generates knowledge concerning the product to design, which is formalised with dedicated formalisms. As seen before, system engineering proposes both a step-gate process and a SYSML formalism. Both are compatible with the steps previously taught. The course was then structured as:

— a global lecture (4 hours) explaining the design process and the formalisms to use at each step of the process, and the presentation of the product to design;

— project sessions (48hours): each one corresponding to an activity of the design process.

Chosen products to design are connected mechatronics products. For considering large number of students (4 then 5 groups of 50 students) and maintaining quality [15], we built a large team of 10 teachers from all required disciplines: mechanics, mechatronics, computing and design methods! Nevertheless, results were not so good, highlighting some limitations mentioned by [16]: students were more motivated due to 'learning by doing' principle, but found very difficult to assimilate the method and formalisms taught at the beginning of the course (scheduled upon 4 months). If allocated time allows a strong application of design process steps, and to manage multidisciplinarity, limitations about reuse still exist and we noticed non-attendance effect during last classes of the course. Therefore, we improve the course introducing new considerations.

3.3. Final pedagogical proposals

The final design process integrates now creativity tools and user-centred design techniques to be more realistic with real life situations, but also to create more motivation for students: they really appreciate being creative. For same reasons, we introduce a company during the course, that promotes the product to design: last year it was a 'connected pillbox' for home care company.

We completely modify the structure of the classes for applying timeboxed pedagogical techniques: the lecture was removed and split into small pieces of 10 minutes, given at the beginning of each class. It is followed by two exercises: a quick one that demonstrates the task to do and the formalism corresponding to this task, then a second one to achieve alone. Only after students are applying what they just learned to the product to design, fully autonomous.

4. Results and discussion

4.1. Case study: a connected pillbox

Health Service Bayonne (HSB) is an establishment which coordinates home medical care services to patients. It manages 225 people and cares nearly 500 patients with little of medium loss of autonomy. The "connected pill" is a concept that may greatly improve the drug process:

— drug catching by reducing the risk to forget it with e.g. visual or sonic alerts and by reducing the fact to take a wrong drug through a limited access to the drugs;
— monitoring without a nurse by saving and/or sending real time information;
— controlling access to the drugs by defining only authorized people for adding or removing drugs: nurse, patient, family…

4.2. Achieved design process and results

Figure 1 introduce the implemented design process, from the analysis steps to the detailed design step, which combines systems engineering activities and creativity activity and users' centred activities (scenarios between users and the system during needs analysis, then proof of concepts identification and their evaluation).

Figure 1
Design process structuring the course

Step	Task	Formalism
Users needs analysis	• Mission and Context • Use cases • Scénarios • Needs rewriting	Context Diagram Use Case Diagram
Requirements analysis	• State of the art • States of the system - Scenarios • Requirements	Use Case D. Sequence D. State Machine D. Requirements D.
Preliminary design	• Functional architecture • Creativity • Proof of Concepts and selection • System architecture	Block Definition D. Internal Block D
Detailed design	• Components modelling • Simulation • Bill of material and costs	+ 3D modelsD, schématics, simulation models, programs, HMI
Verification - integration	• Correlatation solutions, requirements and needs	• Control matrix
Physical prototype	• Prototypes	• Prototypes: software, 3D printing parts, Arduino programming

4.3. Implementation and results

Pillbox project was implemented with 250 students, with 5 groups of 50. During analysis steps, the 2 teachers supervising students work were composed of 1 specialist of methods and 1 expert to help the 1st one. Then during design steps, each expert teacher (mechanics, mechatronics or computing) was moving from one group to another and the method teacher was coordinating students' questions with the expert teachers.

The first phases of development were carried out by the students and allowed to analyse the customer needs, to define the use cases and to explore the state of the art. The state of the art consists of 10 solutions available on the market.

The following three phases of requirements, architectural design and especially the creativity phase allowed the generation of Proof of concepts (PoCs). To reach the PoCs phase, students spent approximately 40 hours of development (from customer needs to Proof of Concepts). These phases resulted in a total of 22 PoCs validating at least the mechanical or mechatronic feasibility of the proposed concept. Among the 22 PoCs proposed, 10 were selected with the company of pursuing the project after the course. Some examples of mechanical virtual prototype are given in Figure 2. All groups were able also to produce a

prototype of the computing subsystem of the pillbox, and 10 generated a prototype of an electronic subsystem.

Figure 2
'Production' of the students

4.4. Discussion

As a feedback, we have noticed higher students' involvement and better academic and technical results than involvement and results in previous sessions with traditional pedagogy. After students' work, industrial partners can exploit this work as preliminary studies by selecting best and relevant ideas to design prototypes and new products. Non-attendance nearly disappear, and several groups of students reuse design process and several formalisms into their projects during the following semesters.

As mentioned by [17], teachers improved also their own skills due to their necessary collaboration, for sharing respective knowledge from their original disciplines and for being able to be able to answer to several types of students' questions.

Future work is now focused on the flexibility of the course activities. For example, we plan to adapt flipped classroom principles [18] and blended learning [19] to make students learn 10 minutes lecture at home. We also plan to use AGILE approach [20] to allow students defining their own path into the learning process.

5. Conclusion

In this paper we focus on the teaching of design engineering of multidisciplinary products/systems. Such a design process is based on the use of systems engineering approach, structuring design steps and proposing formalisms to help formalizing product knowledge. Our case study consists in designing a 'connected' pillbox in real conditions. The pillbox must be innovative faced to existing pillbox, so we introduce creativity methods at relevant steps of the design process. Moreover, in health sector, human is very important, and we introduce a user centred approach based on patient and nurses' observation and on experimentation scenarios to evaluate both concepts of solution and prototypes. Our contribution consists in characterising this integrated design process and proposing a specific pedagogical approach: we elaborate a teaching framework combining project-based learning supported by industrial participation and learning by doing techniques; and we structure each class with the same set of activities theory, practice then project. Future work is for giving more autonomy to the students in the building of their own pathway.

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La teoría de la autodeterminación (SDT) y la implicación del estudiante: un nuevo instrumento para medir la motivación, resiliencia, orientación al trabajo grupal y las percepciones de competencias profesionales durante las actividades de aprendizaje

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Abstract

Recent research from the SDT perspective indicates that changes in student involvement during learning activities produce changes in motivation. After implementing changes in learning activities that favor student involvement, we aim to: 1. measure the academic motivation through the new instrument PLOC-U in the theoretical-practical activities of two different subjects at the end of the semester, and its association with resilience, teamwork, the perceived competence level, and the expectations of academic results. 2. analyze the degree of internalization of extrinsic motivation (Self-determination Index, SDI) of students and their association with other factors such as resilience, group work and self-perception of skills. 316 students of Health Sciences enrolled in the first year of the Degrees of Psychology and Nursing of the University of the Basque Country. Confirmatory factor analysis (CFA) was performed in the new PLOC-U instrument and correlational analysis, using a repeated measures design. The CFA presented an optimal adjustment and good reliability of the PLOC-U. Before the final evaluation, higher levels of motivation were detected in the activities of the practical continuous assessment than in the theoretical classes, being statistically significant $t(315) = -13.238$, $p < .001$ *Cohen Dz* = 0.74 higher the external motivation in the practical activities (x- = 4.10, SD = 0.85) than in the theoretical activities (x- = 3.33, SD = 0.98). 87.5% of the students expected to pass the subject. The average SDI values reveal a low internalization of extrinsic motivation in practical activities in 81.6% of the students. Resilience, cooperative work and the perception of competences were negatively associated with the extrinsic motivation of practical activities. The quality of the student's involvement in the first course in the framework of ECTS studies has to be analyzed considering the type of evaluation, promoting a good level of SDI, controlling the intensity of external motivation and strengthening other associated individual factors.

Resumen

Recientes investigaciones desde la perspectiva de la SDT indican que cambios en la implicación del estudiante durante las actividades de aprendizaje producen cambios en la motivación. Tras implementar cambios en las actividades de aprendizaje que favorezcan la implicación del estudiante se busca:

1. medir la motivación académica mediante el nuevo instrumento PLOC-U en las actividades teórico-prácticas de dos asignaturas diferentes al término del cuatrimestre, y su asociación con la resiliencia, el trabajo en grupo, el nivel competencial percibido, y las expectativas de resultados académicos. 2. analizar el grado de internalización de la motivación extrínseca (SDI) de los estudiantes y su asociación con otros factores como la resiliencia, trabajo grupal y autopercepción de competencias. Participaron 316 alumnos de Ciencias de la Salud matriculados en el primer curso de los Grados de Psicología y Enfermería de la Universidad del País Vasco. Se realizaron análisis factoriales confirmatorios (CFA) en el nuevo instrumento PLOC-U y análisis correlacionales, mediante un diseño de medidas repetidas. El CFA presentó un óptimo ajuste y buena fiabilidad del PLOC-U. Antes de la evaluación final, se detectaron mayores niveles de motivación en las actividades de la evaluación continua práctica que en las clases teóricas, siendo estadísticamente significativa $t(315) = –13.238$, $p < .001$ *Cohen Dz* = .74 mayor la motivación externa en las actividades prácticas ($x^- = 4.10$, $SD = 0.85$) que en las actividades teóricas ($x = 3.33$, $SD = 0.98$). El 87,5% de los alumnos esperaba superar la asignatura. Los valores promedios del SDI revelan una baja internalización de la motivación extrínseca en las actividades prácticas en el 81,6% de los estudiantes. La resiliencia, el trabajo cooperativo y la percepción de competencias se asociaron negativamente con la motivación extrínseca de las actividades prácticas. La calidad de la implicación del estudiante en el primer curso en el marco de estudios ECTS tiene que ser analizada considerando el tipo de evaluación, promoviendo un buen nivel de SDI, controlando la intensidad de la motivación externa y potenciando otros factores individuales asociados.

1. Introducción teórica

La motivación académica

La teoría de la autodeterminación (SDT) de Deci y Ryan (1985) diferencia varios niveles de motivación presentados en un continuo. El mayor nivel de autodeterminación estaría representado por la motivación intrínseca, basada en una orientación autónoma del comportamiento no sujeto a contingencias externas, situación en la que el sujeto tiene una percepción de la fuente y regulación de su conducta en su propia persona (locus interno de causalidad). En el lado opuesto del continuo se encuentra el nivel de autodeterminación más bajo, representado por la motivación externa, justamente aquella en la que se da una ausencia de orientación autónoma pasando a ser controlada por factores externos al individuo (locus externo de causalidad).

Estos autores representan la motivación en un gradiente continuo y no en una función dicotómica absoluta (externa vs. interna), buscando sintonizar la SDT con las bases humanistas representativas del crecimiento personal. Consecuencia de ello fue la definición de tres subniveles en la regulación externa del comportamiento: la motivación externa, la introyección regulada y la identificación regulada. Estos niveles de regulación están presentes en el constructo teórico del instrumento diseñado por Goudas, Biddle y Fox (1994) denominado PLOC (Perceived Locus of Causality) y en el indicador SDI que refleja el nivel de autodeterminación de la persona.

La escala PLOC presenta 5 factores: *motivación intrínseca*, el alumno-a estudia motivado por sentirse competente y autorrealizado; *identificación regulada*, nivel más próximo a la motivación interna, puesto que el alumno-a estudia, consciente de lo ardua que pueda ser su tarea, porque sabe que es importante para su formación en general y para su futuro profesional y personal; *introyección regulada*, que representa un paso intermedio hacia la interiorización de las razones externas a la conducta motivada, ya que normalmente se corresponde con evaluaciones sobre el reconocimiento social de la acción, acompañada de sentimientos de culpa y ansiedad; *motivación externa*, referida al tipo de motivación regulada básicamente por los sistemas contingentes de recompensas y sanciones; y *amotivación*, en referencia a la ausen-

cia de motivación o intencionalidad, característica cuando el alumno-a no encuentra razones para la conducta de estudio.

El PLOC fue desarrollado por como una adaptación del cuestionario Self-Regulation Questionnaire (Ryan y Conell, 1989). El PLOC fue diseñado inicialmente para el estudio de la motivación en el deporte y actividad física. Llegados a este punto, nos planteamos si la escala PLOC podría ser aplicada en el contexto universitario. En ese sentido, consideramos el nuevo marco de estudios universitarios europeos y el nuevo proceso de enseñanza-aprendizaje donde los alumnos comprueban *in situ* sus progresos y trascienden un tradicional rol pasivo pasando a ser generadores de conocimiento. En la perspectiva temporal del análisis de la motivación para un estudiante universitario, se diferencian entre el rendimiento académico inmediato (evaluación y resultado en una asignatura) y diferido (resultados globales al término del grado universitario). El cuestionario PLOC-U (estudios universitarios) estaría orientado preferentemente al análisis de la motivación sobre una actividad universitaria concreta (estudiar una asignatura) y sobre los resultados esperados y obtenidos en la evaluación de la asignatura.

La resiliencia

Tratándose de un término procedente de la literatura psicológica, Thomas y Revell (2016) constatan que no existe una definición clara y extendida para la resiliencia dentro de la curricula académica. Stephens (2013) la define como el proceso individual del alumno donde adquiere factores personales de protección ante situaciones adversas y de estrés.

El trabajo en grupo

Es importante recordar, que, a este nivel, el sujeto no es autónomo para organizar un *teamwork*, ni que participa voluntariamente en el mismo, por lo tanto, esta situación condiciona el análisis a nivel organizacional. La orientación al trabajo en equipo *teamwork orientation* viene definida como la actitud positiva que tiene una persona para trabajar en equipo (Franser *et al.*, 2011).

Autopercepción de competencias

En palabras de Mohamadirizi *et al.* (2015) la competencia es la capacidad de resolver problemas complejos utilizando una combinación de conocimientos, actitudes y habilidades prácticas. Según Nehrir *et al.* (2016) los diferentes estudios han utilizado de manera intercambiable los términos "competency" y "competence": el primero refiere mayormente a un recurso o herramienta "skill", mientras que "competence" refiere a "la capacidad que tiene el sujeto para desarrollar aquella habilidad o manejar una herramienta" (Pijl-Zieber *et al.*, 2014). Para el presente estudio nos hemos decantado por el término "competence" dado que se ajusta más al carácter general del programa educativo que utilizamos.

El presente estudio tiene como objetivos principales: 1. medir la motivación académica mediante el nuevo instrumento PLOC-U (Sánchez de Miguel *et al.*, 2017) en las actividades teórico-prácticas de dos asignaturas diferentes al término del cuatrimestre, y su asociación con la resiliencia, el trabajo en grupo, el nivel competencial percibido, y las expectativas de resultados académicos, y, 2. analizar el grado de internalización de la motivación extrínseca

(SDI) de los estudiantes y su asociación con otros factores como la resiliencia, trabajo grupal y autopercepción de competencias.

2. Método

Participantes

Participaron en el estudio 316 alumnos (89% mujeres) matriculados en el primer curso del Grado de Psicología (n = 224) y del Grado de Enfermería (n = 92) pertenecientes a la Universidad del País Vasco (San Sebastián, Campus de Gipuzkoa).

Instrumentos

PLOC-U: Cuestionario para medir la motivación académica universitaria en actividades docentes específicas: teoría y práctica (Sánchez de Miguel *et al.*, 2017). Está compuesta de 20 ítems para analizar la motivación en el apartado formativo teórico y otros 20 ítems para el apartado formativo práctico. Mide la motivación intrínseca, la identificación regulada, la introyección regulada, la motivación externa y la amotivación. La escala de respuesta se presenta en formato Likert (1. completamente de acuerdo…. 6. completamente en desacuerdo). Las fiabilidades de los diferentes factores de la escala oscilan entre α = .60 y .80.

Brief Resilience Scale (BRS). Escala de medida de resiliencia especifica (adaptada a alumnado de psicología y enfermería) inspirada en la versión original de Smith *et al.* (2008) y de Rodriguez-Rey *et al.* (2016). La versión a utilizar para este estudio se compone de 6 ítems que se responden mediante una escala Likert de respuesta de 1 a 5 (1. totalmente en desacuerdo…. 5. totalmente de acuerdo). Esta escala presenta un coeficiente de fiabilidad de α = .80

Perceived Competence for Nursing Students (PCNS). Este instrumento ad hoc mide la percepción de competencias en los alumnos de Enfermería. Está compuesto de 10 ítems que se responden en una escala de respuesta tipo Likert (1. nada competente…. 5. totalmente competente. Esta escala presenta una fiabilidad de fiabilidad de α = .81. Al igual que la versión de enfermería basada en el libro blanco del grado (ANECA), la versión para alumnos de Psicología presenta el mismo número de ítems e idéntica escala de respuesta, evaluando las competencias específicas del grado de Psicología.

WTAPT: Cuestionario ad hoc sobre el manejo y gestión de trabajos bajo presión de tiempo compuesto de 8 ítems. La escala de respuesta se presenta en formato Likert (1. totalmente de acuerdo…5. totalmente en desacuerdo). Esta escala presenta una fiabilidad de fiabilidad de α = .68.

Procedimiento

A efectos de comprobar la estabilidad del instrumento y la fiabilidad de las medidas se utilizó un diseño de medidas repetidas. Todos los participantes aceptaron participar voluntaria y anónimamente en el estudio.

Análisis

Se realizaron análisis factoriales exploratorios de todos los instrumentos utilizados con el objeto de verificar su estructura factorial). Conocida la estructura factorial se verificó el nivel de fiabilidad. Posteriormente se realizaron análisis descriptivos y correlacionales entre las diferentes variables medida. Para los análisis se utilizaron las herramientas SPSS 21.0 y AMOS 21.0.

3. Resultados

Análisis Factorial Confirmatorio (CFA) y Fiabilidades

Se realizó un CFA al PLOC-U actividades prácticas en la fase retest (n = 265, 84%) obteniéndose una estructura de cinco factores similar al PLOC (20 ítems). Los indicadores de asimetría y curtosis fueron inferiores a 2, revelando una distribución normal univariadas. Todos los ítems presentaron saturaciones superiores a .30, con un óptimo ajuste en línea con lo encontrado en el PLOC-U (apartado teórico) $\chi^2(125) = 271.927$, $p < .001$; $\chi^2/df = 2.185$; IFI = .92 CFI = .93; RMSEA = .06. Sus fiabilidades oscilaron entre $\alpha = .63$ a .82. Las tres nuevas escalas presentaron también un buen ajuste factorial y unas óptimas fiabilidades (Resiliencia $\alpha = .80$; Orientación Trabajo grupal $\alpha = .76$; Autopercepción de competencias $\alpha = .82$).

Análisis de la estabilidad temporal

Una vez se aplicaron las implementaciones de las actividades docentes durante la fase test, se dejaron 4 semanas de espacio para proceder a la fase retest con todos los cuestionarios.

Como se puede apreciar en la *Tabla 1*, el patrón de las puntuaciones medias es igual en la fase test y retest, siendo la introyección regulada el factor que más puntúa, y la amotivación el que menor promedio presenta. Si bien la diferencia entre las puntuaciones en las dos fases resultó ser estadísticamente significativa, el indicador Cohen d_z fue inferior a .40 en todos los factores, revelando un bajo tamaño del efecto. Además, las correlaciones oscilaron entre .52 y .59, lo que evidenciaba una buena estabilidad temporal.

Tabla 1
Diferencias en fase test-retest PLOC-U (apartado prácticas)

Factor	TEST	RETEST	*t*	*Cohen* d_z	*r*
	M (SD)	*M* (SD)			
1. Motiv. Intrínseca	3.81 (0.87)	3.58 (0.89)	4.68***	.29	.57***
2. Identif. Regulada	4.26 (0.89)	4.00 (0.90)	5.28***	.32	.59***
3. Introyección Regulada	4.40 (0.83)	4.31 (0.87)	1.99*	.12.	58***
4. Motivación Externa	4.12 (0.84)	4.17 (0.85)	–.99	–.01	52***
5. Amotivación	2.47 (0.96)	2.90 (1.01)	–7.25***	–.04	.54***

n = 265 [rango 1-6 puntos] *p < .05, **p < .01, ***p < .001.

Análisis descriptivo y correlacional

Los valores promedios de las otras tres escalas (rango 1-5] resultaron ser medio-altos. Resiliencia X = 3.29 (SD = .64), Trabajo cooperativo X = 3.26 (SD = .58), Competencias percibidas X = 3.43 (SD = .54). El análisis correlacional evidenció asociaciones positivas y estadísticamente significativas de la autopercepción de adquisición de competencias con la resiliencia (r = .23, p < .001) y con la orientación al trabajo grupal (r = .14, p < .001). Un 86% de los alumnos aprobó la asignatura. La internalización de la motivación externa SDI X = 46.94 (SD = 5.4) y la resiliencia se asociaron con una calificación alta en la asignatura (r = .12 p < .04 ; r = .21 p < .001, respectivamente). Se observó una asociación negativa entre la resiliencia y la motivación externa en las prácticas (r = –.15, p < .01) y positiva entre la adquisición de competencias y la motivación interna en las prácticas (r = .24, p < .001).

Antes de la evaluación final, se detectaron mayores niveles de motivación en las actividades de la evaluación continua práctica que en las clases teóricas, siendo estadísticamente significativa $t(315)$ = –13.238 , p < .001 *Cohen Dz* = .74 mayor la motivación externa en las actividades prácticas (x = 4.10 , SD = 0.85) que en las actividades teóricas (x^- = 3.33 , SD = 0.98). El 87,5% de los alumnos esperaba superar la asignatura. Los valores promedios del SDI revelan una baja internalización de la motivación extrínseca en las actividades prácticas en el 81,6% de los estudiantes

4. Conclusiones

A la vista de los resultados obtenidos en la motivación presentada por la mayor puntuación de los alumnos en las actividades prácticas medida por el PLOC-U en el desarrollo teórico de la asignatura, cabe reflexionar sobre el posible exceso de contingencias en la evaluación práctica continua conforme al formato ECTS aplicado.

Parece pertinente vigilar la intensidad de la motivación externa, atendiendo a una buena interiorización de la misma, al tiempo que se facilita la adquisición de competencias, y se fomenta la resiliencia del estudiante. Igualmente, la participación del alumnado en las tareas prácticas grupales apunta a que facilita el intercambio de conocimientos y la adquisición de competencias.

Nuestro proyecto continuará en el próximo curso analizando estas cuestiones estableciendo una implementación de competencias relacionadas con el género, origen cultural y edad de los pacientes, así como el impulso de las competencias emocionales, para ver su efectividad comparada con un grupo control.

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Recurrent waves of blue Facebook screens during courses

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Abstract

In this paper, I will discuss how students' use of laptops functions as a testimony of their engagement in class. Through observation of courses at Danish bachelor programmes, I have observed that students' use of laptops seems to move in certain patterns during courses. For certain periods of time, most students are engaged in study-relevant activities on their laptop, such as writing notes or working with digital tools initiated by teachers. During other periods, however, many of these students are more engaged in off-task activities not relevant to the course. Here, Facebook is used most frequently, hence "the blue waves".

This paper is based on my Ph.D. project, which focuses on undergraduate students at Roskilde University from a sociocultural perspective. By means of course observation and interviews with students and teachers, I have been investigating correlations and discrepancies between teachers' and students' attitudes and experiences related to university teaching and learning. One discrepancy frequently observed is related to students' use of laptops in class. I have subsequently encountered this tendency in other universities, and similar findings are presented in international literature as well.

It is evident that in-class engagement is linked to students' cultural norms and habits, but it is also highly influenced by the action of the teacher. Building on empirical analysis, I argue that *visibility*, *response, relation* and *variation* seem to be crucial pedagogical elements to consider if the teacher wants to increase student engagement, and reduce "the blue waves".

1. Empirical foundation

The vast majority of empirical data in this project was produced from work carried out with a course in the second semester of an interdisciplinary degree programme at Humanities. One of the course teachers' didactic intentions was to maintain a high level of student engagement in the classroom. Therefore, they included in the course design various interactive exercises together with explicit communication about teachers' expectations about student engagement. They put a lot of effort into explaining the relevance of the course and had a number of activities to stimulate student motivation and engagement. Thus, from a didactic perspective, these teachers adopted a lot of the strategies often recommended in the literature on teaching and learning in higher education (Angelo, 2013; Biggs & Tang, 2011; Rienecker, Von Müllen, Jørgensen, & Ingerslev, 2015; Ulriksen, 2014). In some aspects of the course, these intentions corresponded quite well with the students' behaviour and how they experienced the teaching. However, in other aspects, there were large discrepancies between these didactic intentions and the students' behaviour and experience of the class. One of these aspects were students' in-class use of laptops.

The course investigated had a total of 500 students, split up into five classes for each semester. Thus, I was able to follow identical course sessions with the same didactic design and facilitated by the same teachers, but held for several different classes. The data consist of 21 observations of teaching sessions. Four of those were part of a pre-survey and 17 were observations of the course itself. My role in these observations can be categorised as *"the participant as observer"* in the sense that I participated in the course, but both teachers and students knew I was doing research. This method is inspired by ethnological research

and makes it possible to collect solid qualitative data of cultural norms and behaviour (Krogstrup & Kristiansen, 2015, s. 94).

The observations were made over a period of three years from 2013-2015. During the same period, I conducted 105 interviews with students. These interviews were conducted just before or after a course session or during a break, and most of them were group interviews. Six teachers allocated to the course were interviewed in 18 individual interviews before and during the course. All interviews were semi-structured and adjusted to the context and to topics that came up during the conversations (Kvale & Brinkmann, 2015, s. 137). The observations and interviews complemented each other in the sense that I asked the interviewees about phenomena that I observed and I focused my observations on the topics mentioned by interviewees.

2. A sociocultural point of departure

The research project makes use of a sociocultural perspective on teaching and learning, meaning that emphasis has been put on *participants*, *activities and context*. (Dysthe, 2013).

Emphasising participants and activities means that I see both teachers and students on the course as participants in a community of practice (Dysthe, 2003; Lave, 2003; Wenger, 2004). They learn and develop though participating in various activities on the course, and their actions and sense-making should be understood in relation to norms and traditions in this community as well as in relation to the physical and organisational context. The teachers have the most powerful position in this community, in that they decide which formal learning activities will take place. However, the students choose themselves how they want to participate in these activities, and as mentioned, they sometimes choose to engage in other activities than the ones suggested by the teachers, e.g. surfing on Facebook.

Through the interviews, both students' and teachers' perspectives have been included in the investigations and observations of what they actually did in class, and my observations of their communication and behaviour in the classroom have complemented these perspectives.

Emphasising context means that I observed how the physical context and the various artefacts influenced the ways in which teachers and students participated. Two of the findings related to the physical context are: 1) that students behave differently depending on where they are seated in the classroom, and 2) that the laptop as an artefact sometimes functions as a stepping stone for student engagement and at other times seems to have a counterproductive effect. The latter phenomena have been found in various other university contexts (E.g. Clayson & Haley, 2013; Ravizza, Hambrick, & Fenn, 2014; Sana, Weston, & Cepeda, 2013; Wood *et al.*, 2012). As Wood *et al.* writes: *"…attempting to attend to lectures and engage in digital technologies for off-task activities can have a detrimental impact on learning"* (Wood *et al.*, 2012).

Emphasising context also means that I have focused on cultural norms among students and teachers. One of the findings in this area is that many students find it quite acceptable to use their laptops for off-task activities if they find the teaching boring or not relevant. Surfing on Facebook or shopping for shoes online is not in conflict with students' norms for in-class behaviour. This is in direct contrast to the norms of the teachers. In the interviews they expressed surprise that the students engaged in these off-task activities, and they had a hard time understanding why students show up in class and then choose to spend time on Facebook instead of on course content.

3. Findings

The main focus of my Ph.D. was on correlations and discrepancies between teachers' didactic intentions and students' behaviour on and attitudes to university courses; and indeed, I found numerous examples of activities that were characterised by having a high degree of correlation or discrepancy.

An example of a situation with a high degree of correlation is an in-class interactive learning activity, where groups of students are asked to discuss and produce answers to academic questions and write these answers in an online digital forum. This forum allows both teachers and students to see the contributions from all the students. The students' work becomes *visible* via the digital forum and this serves as a form of acknowledgement of their effort. Building on the students' written work, the teacher facilitates a *response* in the form of discussion and feedback. Another similar example is an exercise where students are asked to make a series of very short analyses classifying content material into various categories. After each analysis the teacher follows up by using the students' responses to show the appropriate classification. The didactic design allows the students' answers to be seen by everyone, and in the follow-up they receive a response that helps them see whether they had managed to find the right answers.

In the interviews, the students identify several elements that support their engagement in situations like the ones described above. They mention the visibility and response, but they also point out that their perception of their teacher plays a crucial role. When they have a positive relationship with their teacher and perceive him/her as being trustworthy and engaged, they are more motivated to participate actively. Another element is that the exercises provide a welcome variation that stimulates their engagement; the students point out that such variation has a motivational effect in itself.

Variation and relationships also play a role when it comes to student behaviour during teacher presentations. When students perceive their relationship with their teacher to be positive, they tend to put more effort into listening and note-taking. This engaged student participation increases when the teacher makes use of variation in their presentation, e.g. by using different visual aids or incorporating small interactions in their presentation.

After analysing all the data material, it has become obvious that student engagement rises when students' efforts and work becomes visible to others and when they receive some kind of response from teachers or peers. Furthermore, variation and positive relationships also seem to be recurrent factors in situations where students are highly engaged and participate in ways that correspond to the teachers' didactic intentions.

Correspondingly, when the activities or the teaching material seem to be rather uniform with only few or no variations, student concentration and engagement drop. This tendency has been confirmed elsewhere in the literature on HE Teaching and Learning (Bligh, 2000; Gibbs, 1981) (Bligh, 2000; Dahl & Troelsen, 2015; Gibbs, 1981). When students put time and effort into preparing before class or participating in class and this goes unnoticed by teachers and peers, so that they receive no response or feedback on it, their level of engagement falls. And when the students describe their relationship to their teacher in more negative terms or when they find the teachers' lectures monotonous or uniform, their level of engagement seems to drop and their off-task laptop activity rises, resulting in blue waves of Facebook screens.

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Utilización de las metodologías activas para mejorar las habilidades comunicativas de los estudiantes de Odontología

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Abstract

Communication is an essential competence in health professions as Odontology that requires frequent relation with patients to get a correct diagnosis and for good therapeutic management. In the last report of Unibasq they recommended incorporating communication skills training, so we have designed an educational innovation project. Four departments and twenty-five professors teaching in the degree in Dentistry are working in this project to implement this improvement. The objectives of this project are, on the one hand, to analyze the current situation regarding communication in the degree of Dentistry and, on the other hand, to design and implement activities using active teaching, which encourage the participation of students.

In the case of the subject called Psychology and Communication, which is taught in the second year and includes 6 ECTS credits, various activities and cooperative tasks have been designed using active methodologies. The areas that we will teach are oral communication with patients and family members, communication with other health professionals and communication techniques. Therefore, we design some activities to promote constructive and reflective learning including some techniques as *flipped classroom, just in time teaching, peer instruction, analytic team, 124 cooperative technique*. Students test their communication skills using *roleplaying*, simulated patients and conversation analysis. On the other hand, to encourage the empathy we use the 6 hats technique, promoting the cooperative learning using the Jigsaw technique.

We expect that this teaching designs helps to students who study Dentistry degree improving their communicative competence, as well as the use of these active learning techniques encourage their participation and satisfaction with the training.

Resumen

La comunicación es una competencia fundamental en las profesiones sanitarias que requieren un trato frecuente con pacientes para un correcto diagnóstico y buen manejo terapéutico. En el último informe de Unibasq han recomendado reforzar la formación en habilidades de comunicación en la práctica clínica en asignaturas o materias destinadas a este fin, por lo que se ha diseñado un proyecto de innovación educativa en el cual están implicados 4 Departamentos y 25 profesores y profesoras del Grado de Odontología para implementar esta mejora. Los objetivos de este proyecto son, por un lado, analizar la situación actual en relación a la comunicación durante el grado de Odontología y, por otro, diseñar e implementar actividades mediante técnicas activas consiguiendo la participación del alumnado.

En el caso de la asignatura de Psicología y Comunicación que se imparte en el 2.º curso se han diseñado diversas actividades y tareas cooperativas aplicando metodologías activas que impulsan el desarrollo de la comunicación oral y estimulan al alumnado a participar en el aula. Las áreas a trabajar son la comunicación oral con pacientes y familiares, la comunicación con otros profesionales sanitarios y técnicas de comunicación. Con este fin, se han diseñado actividades que fomentan el aprendizaje constructivo y reflexivo, introduciendo *aula invertida, just in time teaching, instrucciones por pares, grupo analítico, la técnica 124*. El alumnado demuestra las habilidades de comunicación mediante el *role playing, pacientes simulados* y análisis de la conversación. Por otro lado, para fomentar la empatía se uti-

liza la técnica de los *6 sombreros*, promoviendo además el aprendizaje cooperativo a través de la técnica Jigsaw.

Se espera que este diseño contribuya a que el alumnado que cursa el grado en odontología mejore su competencia comunicativa, así como el empleo de estas técnicas de aprendizaje activo fomente su participación y satisfacción con la formación recibida.

1. Introducción

La comunicación tanto verbal como no verbal entre el profesional sanitario y el paciente es una parte fundamental dentro del tratamiento en el área de la salud, incluido el campo de la odontología, mejorando la satisfacción del paciente, la adherencia y reduciendo la ansiedad y las quejas de los pacientes (Levinson *et al.*, 1997; Wener *et al.*, 2011). La Asociación Americana de Educación Dental, Comisión de Cambio e Innovación en la Educación Dental (ADEA CCI 2.0) enfatiza un sistema de salud centrado en la persona, dando especial relevancia a la comunicación dentista-paciente (Palatta *et al.*, 2017). Es por ello, por lo que ha incluido esta competencia en el curriculum del grado de Odontología (Haden *et al.*, 2010); sin embargo, existe una gran variabilidad en la forma en la que se incluyen las habilidades comunicativas, en los métodos de enseñanza y en la evaluación en las distintas Universidades de Odontología (Khalifah y Celenza, 2019), e incluso algunas de ellas no incluyen aún la enseñanza de estas competencias en su curriculum (Rütterman *et al.*, 2017; Hannah *et al.*, 2004).

En el último informe de la renovación de Acreditación del Grado de Odontología de la UPV/EHU del año 2017 emitido por UNIBASQ (Agencia de calidad del sistema Universitario Vasco) se recomienda reforzar la formación en habilidades de comunicación y mejorar la coordinación entre los contenidos de asignaturas. El plan estratégico de la Universidad del País Vasco apuesta por el modelo educativo denominado Aprendizaje Cooperativo y Dinámico (IKD, del euskera *Ikaskuntza Kooperatibo eta Dinamikoa*), en el cual se fomenta la utilización de las metodologías activas y en el que adquiere especial relevancia la responsabilidad individual unida a la interdependencia positiva, las habilidades sociales, la interacción directa y la reflexión en grupo.

Las metodologías activas no es un concepto novedoso, estas metodologías incluyen técnicas y estrategias que fomentan la participación activa del alumno en su formación, haciéndole construir su propio aprendizaje, de tal forma que se aprenda de manera integral y flexible (Labrador y Andreu, 2008). El Aprendizaje Basado en Problemas (ABP) centra la participación del estudiante integrando la parte teórica con la práctica, despertando la curiosidad, creatividad y razonamiento crítico e involucrándole en la búsqueda de la información para su propio aprendizaje. El Aprendizaje Basado en Casos es un método que favorece el aprendizaje por descubrimiento, fomenta la realización de preguntas y la respuesta a las mismas para la deducción de las conclusiones, favorece la discusión y acerca el mundo académico al mundo profesional. El Aprendizaje Cooperativo es una forma de trabajar en grupos reducidos en la que cada parte del grupo maneja determinada información para poder complementar la información trabajando la capacidad de comunicación y la confianza entre todos los miembros del equipo. Son numerosas las técnicas investigadas sobre el aprendizaje cooperativo: Jiwsaw Puzzle, 124, 4 sabios, mapas conceptuales, etc… La simulación o "role playing" es un tipo de aprendizaje que parte de la experiencia y de la reflexión que ésta produce en uno mismo. Esta práctica docente permite adquirir habilidades y destrezas que fomentan el pensamiento crítico, la resolución de problemas, la curiosidad intelectual, el pensamiento lógico y la competencia comunicativa. La evaluación por pares es un tipo de aprendizaje usado en las ciencias de la salud, aunque su estudio provoca ciertas controversias. Ha resultado ser efectivo tanto para el aprendizaje de los estudiantes que dan el feedback como para los que lo reciben (Tooping, 2005), e

incluso en algunos estudios se encuentran que este tipo de retroalimentación es más relevante que la del propio docente (English *et al.*, 2006).

2. Objetivos

Los objetivos para llevar a cabo este proyecto fueron los siguientes:

- Determinar la situación actual del nivel de desarrollo y evaluación de la competencia de comunicación en la asignatura de Psicología y Comunicación.
- Reflexionar sobre las debilidades y fortalezas de los contenidos comunicacionales y sobre las metodologías activas dentro de la asignatura como por parte del profesorado.
- Establecer los niveles de implementación, aspectos, indicadores y descriptores de desarrollo de la competencia de la que se va a encargar nuestra asignatura.
- Diseñar e implementar actividades y tareas complejas cooperativas, usando metodologías activas que impulsen el desarrollo de la comunicación oral y escrita en la asignatura de psicología y comunicación incluyendo estos cambios en la guía docente.

3. Método

3.1. Contextualización

El proyecto de innovación educativa (PIE) titulado "Diseño e implementación de un plan estratégico integral para la mejora de la adquisición de la competencia de comunicación por los estudiantes del grado en Odontología" ha sido aprobado por el Servicio de Asesoramiento Educativo del Vicerrectorado de Innovación, Compromiso Social y Acción Cultural de la UPV/EHU.

Este proyecto tiene como objetivo diseñar e implementar un plan estratégico integral que garantice la adquisición progresiva de la competencia de comunicación (oral y escrita) por el alumnado de odontología a lo largo de los diferentes cursos, que facilite una atención de calidad centrada en el paciente y una efectiva relación interprofesional. Para ello, se ha coordinado a profesores de todos los cursos del grado (25 docentes del grado) en el cual están implicados 4 departamentos. Todos ellos plantearán actividades complejas fundamentadas en problemas de la profesión e implementadas a través de metodologías activas y con una evaluación específica que incluya un peso significativo de las competencias comunicacionales en la calificación del alumnado.

La asignatura de Psicología y Comunicación tiene una carga de 6 créditos ECTS. La importancia de esta asignatura dentro del proyecto de innovación es singular ya que una parte de esta asignatura se encarga específicamente de aspectos relacionados con la comunicación.

3.2. Plan de trabajo

Reflexión y análisis crítico de la asignatura de Psicología y Comunicación: fortalezas y debilidades

En una primera fase del PIE destinada a la recogida de información sobre el estado actual de la comunicación en cada una de las asignaturas del grado, se realizará una reflexión sobre los contenidos teóricos y prácticos de la asignatura y las metodologías utilizadas para

el desarrollo de las habilidades comunicacionales. Para ello se realizó un análisis DAFO sobre las fortalezas y debilidades de este proyecto y del cambio en la metodología de enseñanza aprendizaje de la asignatura (figura 1).

Diseño de actividades y tareas cooperativas para el desarrollo

La segunda fase del PIE está dirigida al diseño de actividades docentes para el desarrollo de la competencia. Para ello, se ha elaborado un documento que establece cinco bloques diferenciados de la comunicación (comunicación oral con pacientes y familiares, comunicación oral con otros profesionales de la salud, comunicación escrita con pacientes y familiares, comunicación escrita con otros profesionales de la salud y técnicas de comunicación), y que se deben trabajar de forma paulatina en las diversas materias de los cursos del grado. De este modo, algunos bloques están destinados a evaluar tanto el tipo de metodología utilizada (teoría, videos, juegos de roles, etc..), como las situaciones (primera entrevista, informar de una mala noticia, información sobre diversos planes de tratamiento, prevención) y personajes (niño, adolescente, adulto, anciano, paciente con psicopatología, otros profesionales sanitarios) con los que se produce la comunicación.

Para ello, se ha decidido diseñar dos actividades educativas complejas, tomando como marco el modelo IKD anteriormente mencionado, en el que se utilizan metodologías activas que impulsen el desarrollo de la comunicación oral y escrita. El contenido, metodología y evaluación de dicha actividades serán especificados en la guía docente de la asignatura.

4. Resultados

En primer lugar, los resultados del análisis DAFO de nuestra asignatura permiten poner en evidencia la necesidad de reflexión, estructuración y redacción tanto de las actividades como rúbricas, lo cual implica una estrecha coordinación entre los docentes de la asignatura (figura 1).

En segundo lugar, se ha realizado un diseño de las dos actividades docentes para el abordaje de las técnicas de comunicación:

— La **actividad 1** tiene como objetivo el aprendizaje de la comunicación con un paciente con ansiedad dental. Para el manejo de esta situación se propone, inicialmente, la técnica **flipped classroom**, en la que el alumnado verá unos videos explicativos que abordan los conceptos de la empatía y la escucha activa. A continuación, de forma presencial y mediante el **aprendizaje basado en casos,** se plantea un escenario donde aparecen cuatro personajes: un niño con ansiedad dental, una madre que también tiene miedo al dentista, el odontólogo y el auxiliar. La puesta en común en grupo se realizará mediante la **técnica cooperativa 124**. Una vez leído y analizado el caso, los estudiantes redactarán un guión sobre la evolución del mismo y lo escenificarán (**role playing**). Posteriormente, se juntarán los alumnos en función de los personajes que han representado (**técnica puzzle**) y reflexionarán sobre los sentimientos que tiene cada uno de ellos usando un sobrero de diferente color para cada alumno (**técnica de los sombreros**). Se incorporarán variantes al role playing. En una segunda fase, el alumnado tendrá que haber leído un documento sobre técnicas psicológicas para el manejo del paciente con ansiedad dental (**flipped classroom)**. Una vez en clase, se realizarán grupos en función de la técnica que les haya correspondido y pondrán en común los aprendizajes para explicarlo en grupo pequeño, habiendo una persona de cada técnica en cada grupo (**Jigsaw**).

Figura 1
Matriz DAFO sobre las fortalezas y debilidades de la asignatura frente a la comunicación

Posteriormente, revisarán el primer guion realizado y lo modificarán usando las nuevas técnicas aprendidas; en cada grupo habrá una persona experta en esa técnica (**4 sabios**) por lo que podrán ir guiando al grupo para una óptima resolución. Una vez finalizados los guiones, se realizarán los **role playings** y los propios compañeros evaluarán la escenificación, dando un feedback de grupo (**peer feedback**). Los estudiantes elaborarán dos entregables que deberán ser incluidos en la plataforma **Moodle.**

— La **actividad 2** tiene como objetivo diferenciar entre el modo emocional básico y el avanzado, introduciendo los estilos de comunicación, asertivo, pasivo y agresivo. Para ello, se plantea un **escenario** donde el odontólogo (A) llega a la consulta odontológica y debe comunicar a su compañero (B) la necesidad de esterilizar el material adecuadamente, como tarea de buena praxis clínica (éste no se ha esterilizado de forma correcta debido a un corte de luz, y requiere de 12 horas). Posteriormente, el odontólogo (B) debe comunicar al paciente (C), el cual lleva ya una hora en la sala de espera, que ha de acudir a otra cita a hacerse la extracción, dado que el material no cumple las medidas profilácticas necesarias.

Los estudiantes tendrán que poner en práctica técnicas de psicocomunicación concretas para realizar y recibir críticas, posponer un tratamiento o disculparse: 1) técnica DESC, 2) banco de niebla, 3) como decir que no, 4) técnica sándwich y 5) técnica SPIKES de forma que cada grupo adquiere el compromiso de explicar una técnica al resto del grupo (**Técnica del Puzzle**).

Figura 2
Técnicas, contenidos y resultados de aprendizaje de las actividades

Una vez finalizada esta parte de la actividad, se realizará un **aprendizaje guiado** individual en función de cada uno de los tres roles (**just in time**). Volviendo al grupo, el alumnado ha de escribir un pequeño informe mediante la técnica el análisis grupal (**Analityc team**) basado en el análisis de la situación reto. La siguiente fase de la actividad consiste en realizar el **role playing** sobre la conversación donde se utilizan las técnicas aprendidas y se realiza una evaluación por parte de los compañeros/as (**Peer feedback**). El objetivo de la tercera fase de la actividad, es que las técnicas aprendidas se generalicen a otros escenarios de alto contenido emocional, realizando un **brainstorning** grupal sobre qué situaciones pueden ser sensibles a provocar situaciones problemáticas. Se usará el **visionado de vídeos** sobre los estilos de comunicación, analizando mediante la **técnica 124** el comportamiento de los protagonistas. Los entregables se incluirán en la plataforma **Moodle**.

5. Discusión

Las habilidades sociales y comunicativas son esenciales en los profesionales del mundo sanitario, ya que gran parte del éxito diagnóstico y terapéutico depende de la relación pro-

fesional sanitario-paciente (Williams *et al.*, 2014; Calzadilla-Núñez *et al.*, 2017). En la práctica odontológica también se ha podido comprobar que una buena capacidad comunicativa mejora la adherencia y reduce la ansiedad de los pacientes en la consulta (Haak *et al.*, 2008; Wener *et al.*, 2011).

Cada vez son más las universidades que incluyen dentro de su curriculum docente asignaturas específicas que traten estas competencias o lo añaden como competencias transversales a lo largo del grado (Khalifah y Celenza, 2019). No obstante, no existe un acuerdo sobre cómo se puede enseñar o aprender las habilidades sociales y comunicativas, ni cuáles son las más importantes dentro del campo profesional de la odontología. Por lo tanto, resulta de especial relevancia determinar cuáles son las habilidades comunicacionales más importantes para el trabajo de un odontólogo. Se han identificado hasta 26 aspectos comunicacionales diferenciados, los cuales se han clasificado en habilidades genéricas, habilidades personales específicas, habilidades específicas de tiempo y habilidades en emergencias (Khalifah y Celenza, 2019). Normalmente, los programas educativos implementados no incluyen más de 10, por lo que es necesario identificar cuáles son las habilidades comunicacionales prioritarias a desarrollar. Además, es imprescindible conocer si la intervención, bien mediante asignaturas específicas orientadas al aprendizaje o bien incluyéndolas en asignaturas del grado de forma transversal puede influir en las competencias comunicativas de los alumnos. Por otro lado, en ocasiones, se pone el foco de atención en los mecanismos de evaluación, sin prestar la suficiente importancia al método de enseñanza (Schönwetter *et al.*, 2012 a,b). Todo esto pone de relieve la importancia de la buena planificación, no sólo definiendo los contenidos, sino también la coherencia entre la metodología de aprendizaje utilizada y la correspondiente evaluación.

Recientemente, en el grado de odontología de nuestra universidad se está llevando a cabo un espacio de reflexión. Para ello, dentro de un proyecto de innovación ambicioso que afecta a todos los cursos, se ha realizado un análisis de las fortalezas y debilidades, que permitan implementar las acciones de mejora para abordar aspectos relevantes, como son las técnicas de comunicación, con un prisma más activo de enseñanza-aprendizaje. El diseño de las actividades docentes a través de metodologías activas, está suponiendo una reelaboración de algunos aspectos de la asignatura. Normalmente, para la enseñanza de las habilidades comunicacionales en odontología se comienza con técnicas pasivas, como es el caso de clases más teóricas, para, posteriormente, utilizar técnicas activas (Khalifh y Celenza, 2019). En nuestro caso, hemos decidido utilizar una combinación de ellas, que incluyen técnicas cooperativas, role playings, aprendizaje basado en casos, aula invertida, evaluación de pares, etc... para dar un mayor dinamismo y atractivo en la implementación individual y grupal de las actividades docentes. Varias de estas técnicas se encuentran entre las más empleadas, como son el role playing, los pacientes simulados y los pacientes reales, en las que se van introduciendo variaciones como las grabaciones de los role playings o el feedback de los compañeros (Khalifah y Celenza, 2019). No obstante, existen otras técnicas como el aprendizaje online (Rüttermann *et al.*, 2017; Wagner *et al.*, 2011), el paciente como instructor (Wagner *et al.*, 2007; Broder *et al.*, 2015), el aprendizaje por pares (Krause *et al.*, 2017; Lanning *et al.*, 2007), y la observación clínica (Lanning *et al.*, 2010; Mariño *et al.*, 2012; Yoshida *et al.*, 2002) que también se muestran efectivas pero no son tan utilizadas. Por tanto, no se puede establecer una metodología única y más efectiva frente a otras, ya que cada una ejerce su función dentro del aprendizaje. Cada docente deberá escoger la combinación de técnicas que mejor se adecué a su diseño metodológico y a las habilidades comunicativas que crea más adecuadas incluir en su proyecto docente.

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Insights from previous semesters' students help new students engage better with the digital learning environments

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Abstract

This paper is concerned with student engagement in online environments. Much research on students' engagement in physical environments has been done, but an equal body of research on engagement in digital learning environments in Higher Education still needs to be developed.

The paper will show and discuss how the use of an adapted version of Frigga Haug's Collective Memory Work (CMW) method, can give new insights into the barriers of engaging in online learning activities and help the new students engage better with the digital learning environments.

The data presented is based on three CMWs applied on three successive semesters where students were asked to write about their experiences of advantages and barriers for exclusively studying and learning online for a week. When returning to class, teacher and students discussed their experiences and formulated advice to be passed on to next semester's students about how to overcome the challenges of the online week.

CMWs revealed that when students are asked to study and learn exclusively in an online environment they meet different types of barriers:

1. Missing the teacher as curator of materials.
2. Change of study environment from private to public space.
3. Missing academic reassurance.
4. Missing reassurance of social acceptance.
5. The feeling of having ones personal boundaries overstepped.

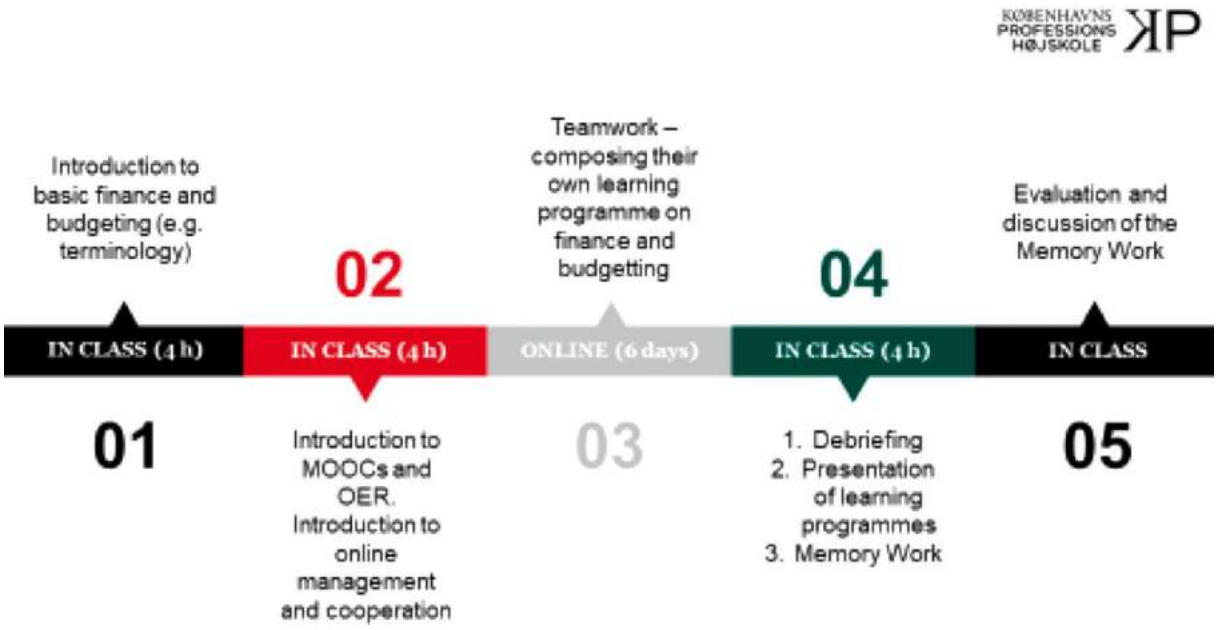
Each semester the findings and reflections from the students' CMWs were passed on to the new students the following semester in the form of advice. Students' advice included e.g.: Allocating time for social activities, working at the same time as at least one other group member, frequent meetings and short deadlines, defining own learning objectives and if necessary work outside home, e.g. in a library.

The conclusion is that students clearly followed the advice, which led to increased learning each semester. The most decisive increase in student learning happened when they were advised to develop their own learning objectives, which gave them a stronger sense of control and added more meaning to the project. From the teachers point of view the CMWs were informative about the learning obstacles students were facing and a helpful tool when meeting the students pedagogically.

1. Introduction

At Copenhagen University College the course *Sustainable innovation and Project Management* is offered as part of the BA-education 'Health and Nutrition'. The course has a duration of 10 weeks and one of those weeks is based solely on online learning. The topic of the online week is finance and budgeting, but the primary learning objectives are to make students aware of and consider how to use the range of online educational resources to support and design their own learning process as well as how to communicate and cooperate with peers online.

Figure 1
Timeline illustrating the complete course of study



Before the week began students got four hours of introduction to online educational resources such as MOOCs and OER plus online management and cooperation. After the first semester they received four hours of introduction to basic terminology, and theory on finance and budgeting was added as the CMWs and evaluations revealed that students needed some basic knowledge before they were able to select and learn from online resources.

After this introduction, students had 6 days where they could only meet online and had to compose and follow a self-designed study plan of 15-20 hours. On the 7th day students would meet in class and present their study plan and evaluate their choice of online resources. They would also discuss the challenges they had been facing and together with the teacher develop advice to next semester's students. Students would have a few days to write their CMW and then the content would be discussed in class.

First of all, the aim of including an adapted version of CMW in the course design was to facilitate the students' reflection on and discussion of their experiences of advantages and barriers to self-directed learning online. Secondly, the use of CMW was meant to enable the students to develop ideas on how to overcome the barriers. Last but not least, the method should also support peer-to-peer learning by allowing students from following semesters to learn from the experiences of their peers. Altogether this was meant to increase students' engagement and learning considerably.

1.1. Adapting Frigga Haug's Collective Memory Work method

CMW is a social constructivist and feminist research method developed by Frigga Haug. Haug wanted to explore *the process whereby individuals construct themselves into existing social relations* [1]. Haug's intention was to create a methodology that involved and gave women's everyday experience a status in research [1]. When everybody participates in the interpretation of the research data, participants become both researchers and informants.

Consequently, the traditional distinction in research work between subject and object is eliminated [1].

The usual approach is to make participants write diary notes based on an introductory presentation that sets the framework for the CMW. Participants are then given access to the CMWs of the rest of the class and selected texts are discussed and interpreted jointly.

An MW is a private diary note 1½-2 pages written about a self-elected episode from the online week. They are encouraged not to interpret, but simply describe the situation, thoughts, feelings and reactions using the voice of the 3rd person in order to distance themselves from the work.

Haug worked with distant memories and her participants all volunteered [2]. They were encouraged to spend some time finding a memory they wanted to write about and the group would decide together, which topics to focus on and interpret the data together.

I adapted Haug's methodology in the following ways:

1. Students are restricted to finding a recent memory that stems from the online week. They can use any episode and the MW is an ungraded exercise to provide insight into what they consider important, which is likely to have influenced their experience of learning in an online environment.
2. I pinpoint elements from the MW in advance. I do so, because I get the general picture when reading all the MWs, but I interfere as little as possible in the discussion —only asking questions to clarify the issues— not interpreting on behalf of the students.
3. As a teacher, I confine the subject to relate to the virtual week and writing a MW is a precondition for sitting the concluding exam. Both underline a power relation between the students and myself, which it was one of Haug's intentions to eliminate. The power relation is further underlined because I add my pedagogical knowledge to supplement the advice passed on to the students the following semester. However, the MW is ungraded, which is usually what influences student behavior and choices.

2. Analysis – Factors that Influence Student Engagement in Online Environments

For three continuing semesters, there was an increase in student learning when they followed the advice from previous semesters. In their CMW they gradually developed a more precise language from innate frustrations in the first semester to more specific expressions culminating in a very concise language pinpointing problems and sometimes even suggesting solutions to them.

The overall theme of the first semester (S1) was procrastination that prevented students from studying effectively. Student engagement increased when group members met frequently and had daily deadlines. The main issue the second semester (S2) was missing a teacher, which was dealt with in the third semester (S3) by suggesting that students define their own learning objectives. This resulted in a significant increase in learning and engagement as they felt more in control of the situation and had a parameter to measure their learning against.

The dominant issue that was never expressed directly, but ran through the texts for all three semesters was the feeling of loneliness. Students could compensate by allocating

time for social activities, e.g. by arranging something social in the afternoon or spending 15 minutes on chit-chat with their group when meeting online, but this would only reduce the loneliness, not eliminate it.

Working alone gave students flexibility – they saved time on transport and could study whenever they wanted to and had a spare moment. The price was loneliness. Saving time commuting implied not seeing people. And studying when they personally had a time slot also implied that they were alone. Consequently, some students found out that they could work more focused if they were in contact with a fellow student via video or social media while working. They did not need to communicate. It was sufficient to know that somebody was there.

The challenges students were facing during the three semesters were:

1. Missing the teacher as curator of materials.
2. Change of study environment.
3. Missing academic reassurance.
4. Missing reassurance of social acceptance.
5. Feeling your personal boundaries overstepped.

2.1. Missing the teacher as curator of materials

Some students had previous experience with e-learning and liked to study online, but the difference was that the teacher had validated the study materials. The online week was adult learning where they were composing their own study plan and selecting the material, and it required a degree of independence that is not usually demanded. Moreover, they were dealing with a topic that most were unfamiliar with.

The more disciplined students became active learners doing quizzes, writing notes and formulating questions for the other group members. As a student wrote: *She thinks that it is nice to do a quiz occasionally. It gives her a feeling of having learnt something and an idea about how much she has understood* (S2). Other students stuck to the passive learning such as watching videos and reading and as a consequence learned less and generally found the online week uninspiring.

Missing the authority of the teacher was also reflected when some students revealed that they already had some knowledge about finance and budgeting, but it never occurred to them to teach their fellow students – or at least share their knowledge.

2.2. Change of study environment – from public to private space

He misses the usual framework, the rooms, the teacher by the white board, the schoolbag, the lunch, the clothes and all the other things. What he less than 15 minutes ago considered as freedom has suddenly been replaced by frustration and they have become essential tools for his ability to learn (S2).

When you are lost and do not know how to continue, the feeling of loneliness increases because there is no one to help you move on. On Campus there is usually someone to ask. Or at least it is an encouragement to see that other people are studying. *She missed the physical presence from the studies with fixed breaks and specific start and end times and that you were surrounded by an influential study environment that encourages study work* (S2). Students express how they suddenly find themselves situated —alone— in a room that usually signifies

something else to them such as leisure, freedom, privacy, relaxation and intimacy. Something belonging to their private life. In contrast to the public life at Campus, which is associated with learning, studying and (social) group activities. Some are very conscious about never studying at home and to them it appears transgressive suddenly having to do so.

A single student worked in a church. It was a regular habit of hers and she described it as *appropriately homelike and comfortable so she liked working there* (S3). Other students focused upon creating a pleasant space at home, with incense, candles, the smell of coffee or freshly baked rolls. However, this is also some kind of procrastination as the private room is a constant reminder of daily deeds that need to be done. That temptation is not present at Campus.

2.3. Do I actually learn something? – Missing academic reassurance

A lot of thoughts run through her head whether it is good enough what she is doing and how far the rest of the group has come. (S3)

Students expressed how they missed the reassurance that they did the right thing – or at least somebody else was doing the same thing as themselves. In contrast to the classroom where everyone is being presented with the same teaching (even though they may do something else while it is taking place) and the teacher can confirm if what you are doing is right or not. A student writes: *that day she really realises how much the members of the group and the discussions that occur when they are physically present together mean to the understanding and learning. At least to her. She misses her group and what they usually share* (S3).

The interesting thing is that students seem even more concerned with doing the same as somebody else, rather than doing what is right. It appears from the MW that even though students miss the teacher support as a reassurance, they do not question whether fellow students can do the same. If both have reached the same conclusion, that suffices. Feeling safety through the association with similar others exceeds the need for teacher supportiveness. This was also underlined as students only made use of the offer of online supervision a few times. The teacher was accessible through Skype four hours every day and students expressed that it was comforting for them to see that the green light was on. Instead of getting supervision it was enough to know that the teacher was "somewhere out there".

2.4. The need and longing for the reassurance of social acceptance

Well, it is nice to sit at home with a hot cup of tea, but she would give anything to have her group sitting in front of her at the table. The table suddenly seems empty, and she goes to sit under her duvet instead. (S3)

Through all three semesters students express loneliness and a yearning for the reassurance of social acceptance. This is reflected in two ways:

1. Recurrent worries about signs that might indicate lack of acceptance
2. Strong consciousness about answering their group out of fear of losing social acceptance.

When all communication is reduced to the actual task or subject, students feel that they are left on their own. Even though they on camera can see body language and hear the

change in tone, communication is still considerably reduced. The supplementary information that they get when meeting irl as well as the social situations are not present and this creates a feeling of insecurity as if "something is missing".

When presence in space is being replaced with presence in time, students experience time in the digital world the same way as in real space though it is not. E.g. when a person is absent and as a consequence does not respond immediately. This often feels like a rejection, but delays in virtual space are usually because the recipient has not read the message yet. In general, if communication is not working, they feel excluded and the negative experience is reinforced because they work on their own.

A student tells about a situation where her internet connection suddenly stopped working. It took her 20 minutes to re-establish it. When she returned no one had noticed that she was missing. They gave her an update, but she continued the meeting with the undefinable feeling that she had lost something or missed important insights.

Delays often mean that you receive several messages at the same time and it feels like everybody speaks at once, which they would not do in the real world. Delays can also lead to answering messages where the sender has already moved on to something else, which causes misunderstandings, frustrations and sadness. Feeling that the recipient does not want to listen to you.

A student describes how interruptions and technical noise become extra difficult, because you are working with unfamiliar terminology. If you were familiar with the topic you would in many cases be able to guess the words that you cannot hear, but it is more difficult when the topic is unfamiliar. This increases the feeling of being lost.

The technical obstacles also impede common social codes. Especially when it comes to greetings and farewells. Whereas they accept that it often takes 15 minutes to start a meeting, they never get used to the frustration of someone leaving a meeting without saying good-bye. They do not experience it as a proper farewell and feel rejected. Students were informed from the beginning that technical obstacles were a permanent —not a temporary— condition. They used it when planning meetings, but they did not transfer it to their negative experience related to technical delays.

It might be that there is less chit-chat at the online meeting, but on the other hand it becomes more difficult to ask questions. Besides, she appreciates the chit-chat. It is something that motivates her to go to school every day. When the rest of the group Is no longer there, it feels empty and the school work takes up too much time. (S3)

It is the need for social acceptance that drives them forward and makes them work. They are extremely aware that they have to answer to their group and in most cases that is what makes them get the work done. Even when they are confused and bored.

2.5. Unresolved issue – Online meetings feel transgressive

An unresolved issue that returned in all three semesters was students writing about how they felt their personal boundaries crossed when they had to give fellow students access to their personal space. It was only a few students each semester, but they wrote concurrently about how they felt uncomfortable about letting people you only had a professional relation with, into your private space.

People studying health and nutrition generally care about their appearance, but the awareness seems to increase when meeting online. Based on their writings it is because they

suddenly watch themselves while speaking on the video. As one student says: *As soon as your PC shows four faces turned against you, it actually becomes unpleasant watching the screen. In the physical meeting all group members have their PC in front of them. She has a feeling that at this meeting group members are exposed more than usual. In this way of meeting, neither she nor the others can hide behind their computer. They are directly connected through image and sound* (S2).

Some students spent a couple of hours cleaning their room before meeting their group. Others use considerable time adjusting the camera, so the group cannot see the mess.

It was suggested that students kept their profile picture on instead of a camera, but they did not want to give up that service either so the issue has remained unresolved and still causes discomfort among them.

3. Conclusion

Though the online learning week was about finance and budgeting, the real learning outcome was learning how to upgrade yourself using online educational resources and learning about online cooperation.

After three continuing semesters it was still not a favorite task for the students though procrastination had been considerably reduced, students had become more active learners and defining their own learning objectives gave the work more meaning. Loneliness is still a dominant issue that impedes student learning. It has been reduced, but not eliminated and probably never will be. Loneliness is therefore a considerable factor that needs to be taken into account, when planning online teaching.

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Resultados del uso de vídeos docentes en Educación Superior

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Abstract

Video has become an important component in education, especially in blended learning and masive open courses. In recent years, the use of video has been extended to traditional teaching with the introduction of the inverted class pedagogical model (Flipped Classroom: FC).

Numerous studies have shown that video improves learning, as well as motivation and the feeling of self-efficacy (Brame, 2016). However, it is necessary that the video meets a series of requirements such as an adequate cognitive load, which ensures student commitment and promotes active learning.

In the present study we have analysed the perception that our students have about the usefulness of videos in their learning process, comparing the videos made with lightboard versus other formats and with respect to the classical methodologies used in the face-to-face class. In addition, we have analysed the changes in the learning results obtained after the implementation of the videos within the FC methodology. For this purpose, videos have been created for different subjects of the Biotechnology, Biomedicine and Pharmacy degrees of the Francisco de Vitoria University.

The results of this analysis show us that students make a very good assessment of videos, especially those recorded with lightboard. Regardless the different subjects, the students consider that videos improve the understanding of the contents and facilitate their learning. This is related to a higher valuation of the traditional class with blackboard versus the classes with PowerPoint. In addition, the use of videos in general improves academic results. This is not the case if the student does not feel interested in the subject and perceives it as a simple subject.

Resumen

El vídeo se ha convertido en un componente importante en educación, especialmente en la enseñanza semipresencial y es esencial en los cursos masivos abiertos. En los últimos años, su uso se ha extendido a la enseñanza tradicional con la introducción del modelo pedagógico de la clase invertida (Flipped Classroom, FC).

Numerosos estudios han demostrado que el vídeo mejora el aprendizaje, así como la motivación y el sentimiento de autoeficacia, pero para ello es necesario que el vídeo cumpla una serie de requisitos como son una carga cognitiva adecuada, que asegure el compromiso del estudiante y que promueva el aprendizaje activo.

En este estudio hemos analizado la percepción que tienen nuestros alumnos sobre la utilidad de los vídeos en su proceso de aprendizaje, comparando los vídeos realizados con lightboard frente a otros formatos y respecto a las metodologías clásicas utilizadas en la clase presencial. Además, hemos analizado los cambios en los resultados de aprendizaje obtenidos tras la implementación de los vídeos dentro de la metodología FC. Para ello, se han creado vídeos para distintas asignaturas de los grados de Biotecnología, Biomedicina y Farmacia de la Universidad Francisco de Vitoria.

Los resultados de este análisis nos muestran que los estudiantes hacen una muy buena valoración de los vídeos, especialmente aquellos grabados con lightboard, e independientemente de la asignatura que cursen, consideran que éstos mejoran la comprensión de los contenidos y les facilita su aprendizaje. Esto está relacionado con una mayor valoración de la clase tradicional con pizarra frente a las clases con PowerPoint. Además, el uso de vídeos en general mejora los resultados académicos. Esto no es así si el alumno no siente interés por la asignatura y la percibe como una asignatura sencilla.

1. Introducción

1.1. Beneficios del uso de vídeos en educación

La utilidad de la tecnología en el aprendizaje ha sido demostrada en varios metaanálisis (Schmid y cols., 2014), y son muchos los trabajos que señalan al vídeo como herramienta educativa altamente eficaz (Brame, 2016). Entre los valores que el vídeo puede aportar a la educación están el valor cognitivo, a través de estrategias visuales que incentivan el aprendizaje, el valor experiencial, al permitir a los estudiantes observar situaciones difíciles de experimentar en su día a día, y el valor substancial, referido al poder de los vídeos sobre la motivación (Koumi, 2006).

Sin embargo, el vídeo no es efectivo por naturaleza. Guo y colaboradores (2014) demostraron que los estudiantes ignoran largos segmentos de los vídeos educativos, mientras que MacHardy y Pardos (2015) demostraron que algunos vídeos contribuían poco al aprendizaje de los estudiantes. Por lo tanto, para que el vídeo sea realmente productivo es necesario que cumpla tres elementos en su diseño e implementación: 1) aportar una carga cognitiva adecuada, 2) asegurar el compromiso del estudiante y 3) facilitar el aprendizaje activo (Brame, 2016).

1. Aportar una carga cognitiva adecuada, es decir, promover la adquisición de un conocimiento duradero y aplicable, implica facilitar la selección e integración de los contenidos importantes y minimizar los superfluos. El vídeo, al utilizar los dos canales de adquisición de la información sensorial, el canal visual/gráfico y el canal auditivo/verbal (Mayer, 2003), facilitará la integración de la nueva información en las estructuras cognitivas existentes.
2. Uno de los principales motivos por los que suele fracasar el FC es que los estudiantes no vean los vídeos, por lo que diseñar estrategias que aseguren el compromiso de los estudiantes serán esenciales para el diseño e implementación de los vídeos en educación.
3. Por último, es importante incluir elementos que promuevan un visionado activo del vídeo para aumentar el aprendizaje a través de mecanismos que favorecen la autorregulación de los estudiantes, es decir, la monitorización de su propio aprendizaje.

En este trabajo hemos analizado la percepción de alumnos universitarios sobre el efecto que tienen los vídeos en su propio proceso de aprendizaje. Pero, además, hemos corroborado que el formato de los vídeos y la forma de convertirlo en interactivo es importante a la hora de asegurar el compromiso de los estudiantes y la visualización activa de los mismo.

1.2. Videos realizados con la lightboard

En estos vídeos, la pizarra tradicional ha sido reinventada de forma que se utiliza un vidrio en lugar de una pizarra y tinta luminiscente en lugar de tiza. Inventado originalmente por Michael Peshkin en la Northwestern University (Peshkin, 2018), las ventajas de esta herramienta son numerosas, tanto para el estudiante como para el profesor.

Para el estudiante, los vídeos con lightboard suponen un contexto familiar porque simulan la clase presencial con su profesor, con la ventaja de que pueden visualizarse cuantas veces quieran, adaptándose, por tanto, a los diferentes ritmos de aprendizaje. Además, el contenido se muestra de una manera atractiva que estimula su atención.

Para los docentes, la lightboard es una oportunidad de grabar las explicaciones de una manera natural, ya que, al estar acostumbrados a escribir en una pizarra, permite conservar el estilo de enseñanza propio y hace más cómoda la grabación. Por otro lado, la pizarra frontal transparente se encuentra físicamente entre el profesor y la cámara, y eso ayuda a minimizar los problemas de timidez que pueden tener muchos profesores delante de una cámara. Además de permitir crear vídeos más atractivos y claros, la lightboard es ideal para las disciplinas STEM, pero puede utilizarse para cualquier disciplina que haga uso de los símbolos, dibujos, ecuaciones, fórmulas y diagramas para explicar procesos complejos.

Nuestra hipótesis es que los vídeos creados con lightboard utilizados en este trabajo, facilitan el cumplimiento de dos de las premisas expuestas anteriormente: asegurar una carga cognitiva adecuada, al permitirnos aportar la información de una forma gráfica, verbal y llamativa; y asegurar el compromiso y motivación de los estudiantes, por ser novedoso, familiar y atractivo.

1.3. Interactividad y distribución de los vídeos mediante Edpuzzle.

Una vez creados los vídeos, es importante que los estudiantes no solo los vean, sino que interactúen con él. Para ello, lo más adecuado es introducir preguntas en el vídeo durante o después de crearlo. De esta forma, por un lado, los estudiantes van a procesar la información y monitorear su propia comprensión realizando un aprendizaje más activo, y, por otro lado, el docente irá después a clase conociendo los conceptos erróneos de los estudiantes para poder abordarlos durante el tiempo presencial. En este trabajo hemos utilizado la herramienta Edpuzzle para enriquecer los vídeos con preguntas o anotaciones, que aseguran el tercer requisito necesario para hacer un vídeo eficaz, facilitar el aprendizaje activo.

2. Objetivo

En este trabajo se ha evaluado el efecto sobre los resultados académicos y la percepción de los alumnos sobre su propio proceso de aprendizaje respecto al uso de diferentes formatos de vídeo, en particular lightboard, y a las herramientas empleadas en la clase presencial, pizarra tradicional o presentación con power point.

3. Metodología

3.1. Elaboración de videos

3.1.1. *Diseño o preproducción del vídeo*

Es importante tener en cuenta que la grabación de un video educativo no es reproducir una clase magistral, por ello, en este trabajo se siguió una metodología similar para la elaboración de todos los vídeos. El primer paso antes de la grabación es realizar el diseño de un guion para seleccionar cuál es la información importante y cómo se va a resaltar, y para decidir cómo se van a relacionar las diferentes partes del contenido. Además, este guion permite asegurar que la duración de los vídeos sea inferior a los 10 minutos, lo que asegura el compromiso del alumno. Un análisis a partir de 6,9 millones de sesiones de visionado de vídeos realizado por Zambrano y colaboradores en 2016 mostró que los vídeos de más de 6 minutos no se ven completamente.

3.1.2. *Grabación y edición*

La mayoría de los vídeos fueron grabados utilizando una pizarra frontal transparente, siguiendo las recomendaciones de Valle y Sánchez-Galán (2018), en las instalaciones del Instituto de Innovación de la Universidad Francisco de Vitoria, y editados con los programas Adobe Premier e iMovie.

Figura 1
Fotograma de un vídeo grabado con Lightboard

Para comparar la eficiencia de este formato sobre otros, hemos realizado algunos vídeos con Power Point. Además, se han utilizado vídeos de otros autores publicados en YouTube.

Siguiendo estas recomendaciones, se han elaborado vídeos para las siguientes asignaturas:

— Biología Celular, 1.er curso del grado en Biomedicina (BCBM); n = 35.
— Fisiología Animal y Vegetal, 2.º curso del Grado en Biotecnología (FBT); n = 39.
— Fisiología, 2.º curso del grado en Biomedicina (FBM); n = 26.
— Microbiología, 2.º curso del Grado en Farmacia (MF); n = 15.
— Bioestadística, 1.er curso del Grado en Biotecnología (BBT); n = 28.

3.2. Interactividad de los vídeos

Todos los vídeos fueron distribuidos a los alumnos usando la herramienta Edpuzzle. Esta herramienta nos ha permitido inserta preguntas y comentarios, enlazar imágenes o páginas web, y monitorizar la visualización del vídeo y las respuestas de los alumnos. De ese modo, hemos podido hacer un seguimiento del compromiso adquirido por los estudiantes.

Como norma general, todos aquellos alumnos que no visualizaban el video previo a la entrada en el aula, no podían participar en las actividades presenciales.

3.3. Uso de los vídeos

Los vídeos se emplearon siguiendo la metodología FC, en la cual los alumnos deben de ver los vídeos fuera del aula y, posteriormente en clase, realizar actividades que requieren un nivel cognitivo superior con la ayuda del profesor. Estas actividades reforzarán el aprendizaje y facilitarán el "almacenaje" del contenido en la memoria a largo plazo.

3.4. Valoración de la percepción de los alumnos sobre las herramientas utilizadas

Se ha diseñado una encuesta común para todas las asignaturas implicadas que nos ha permitido evaluar la satisfacción y percepción de los alumnos sobre las distintas herramientas utilizadas en la explicación de contenidos (tabla 1). Para el análisis de los resultados de las encuestas se llevó a cabo un análisis estadístico empleando el programa R Commander.

Tabla 1
Preguntas de la encuesta realizada a los alumnos. Cada pregunta se evalúa del 1 al 6, siendo el 1 la valoración más baja y 6 la más alta

Interés por la asignatura.
Qué nivel de dificultad encuentras en la asignatura.
¿Cómo han ayudado en tu aprendizaje las clases teóricas de power point?
¿Cómo han ayudado en tu aprendizaje las clases teóricas de pizarra?
¿Cómo han ayudado en tu aprendizaje los vídeos generados mediante lightboard?
¿Cómo han ayudado en tu aprendizaje los vídeos generados mediante power point?
¿Cómo han ayudado en tu aprendizaje los vídeos generados por otros autores (youtube..)?
¿Cómo consideras que los vídeos han contribuido en la comprensión de la asignatura?
¿Cómo consideras que los vídeos han facilitado el aprendizaje de la asignatura?

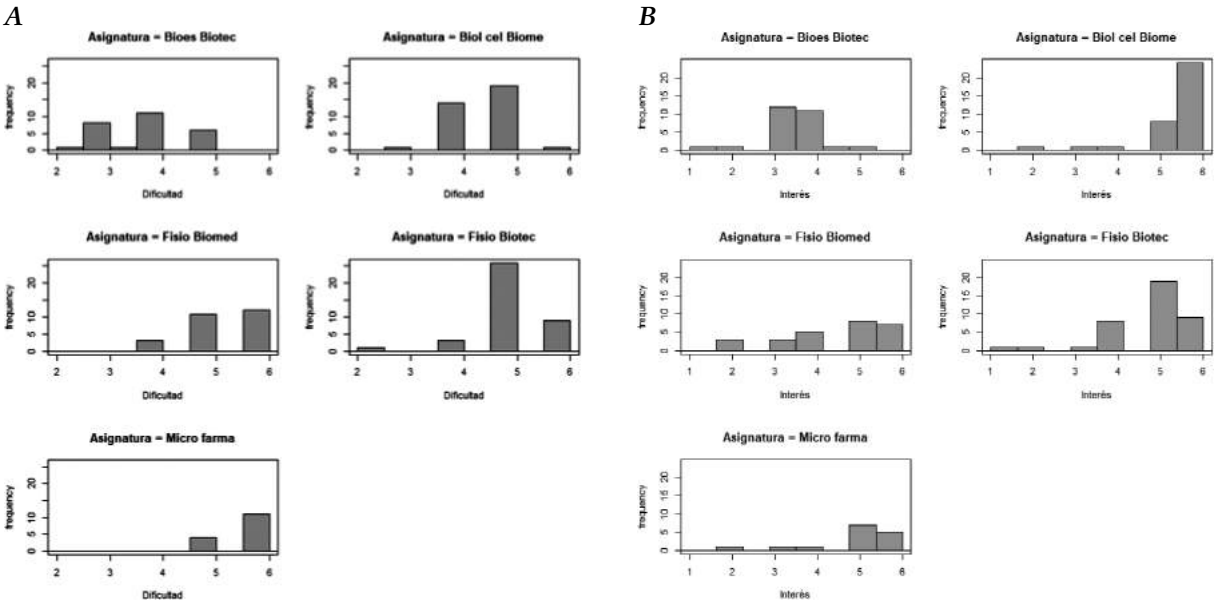
4. Resultados y discusión

4.1. Percepción de la dificultad y grado de interés por las diferentes asignaturas

Al realizar este trabajo en diferentes contextos (asignaturas, cursos y grados), en primer lugar, se ha analizado la percepción de dificultad de las diferentes asignaturas y el interés por parte de los alumnos. La distribución de los datos obtenidos se muestra en la figura 2.

Figura 2

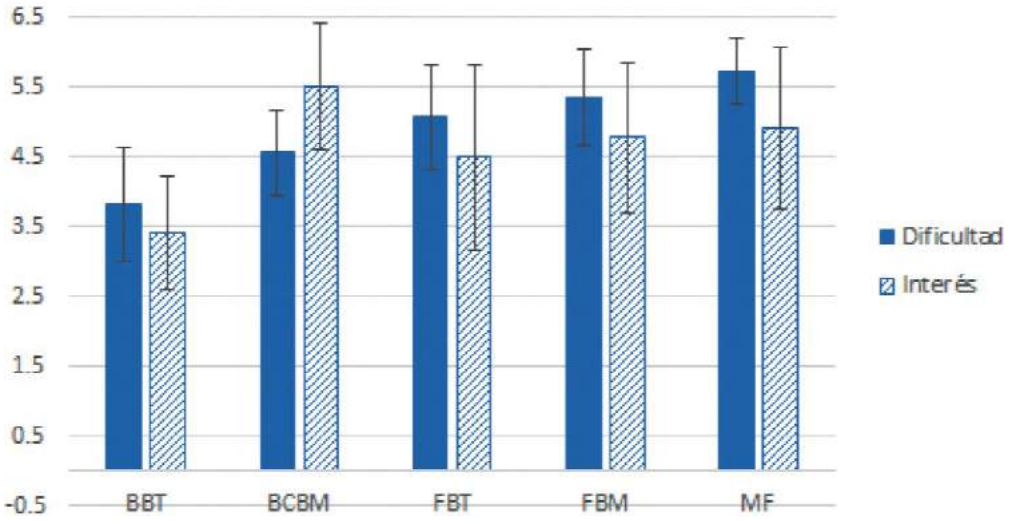
Resultados del análisis de percepción de la dificultad (A) y el interés (B) de los alumnos en cada una de las asignaturas



Analizando la tendencia de las medias en cada caso (figura 3) podemos observar que no hay relación directa entre la dificultad y el interés con las que los alumnos valoran las asignaturas. La mayor dificultad la asignan a MF y a FBM. Las asignaturas de primer curso son las que despiertan tanto mayor como menor interés entre los alumnos, siendo BCBM la que produce mayor interés, mientras que BBT es la que genera menor interés coincidiendo, además, con la percepción de menor dificultad.

Figura 3

Comparación entre la dificultad y el interés que muestran los alumnos para cada una de las asignaturas valoradas

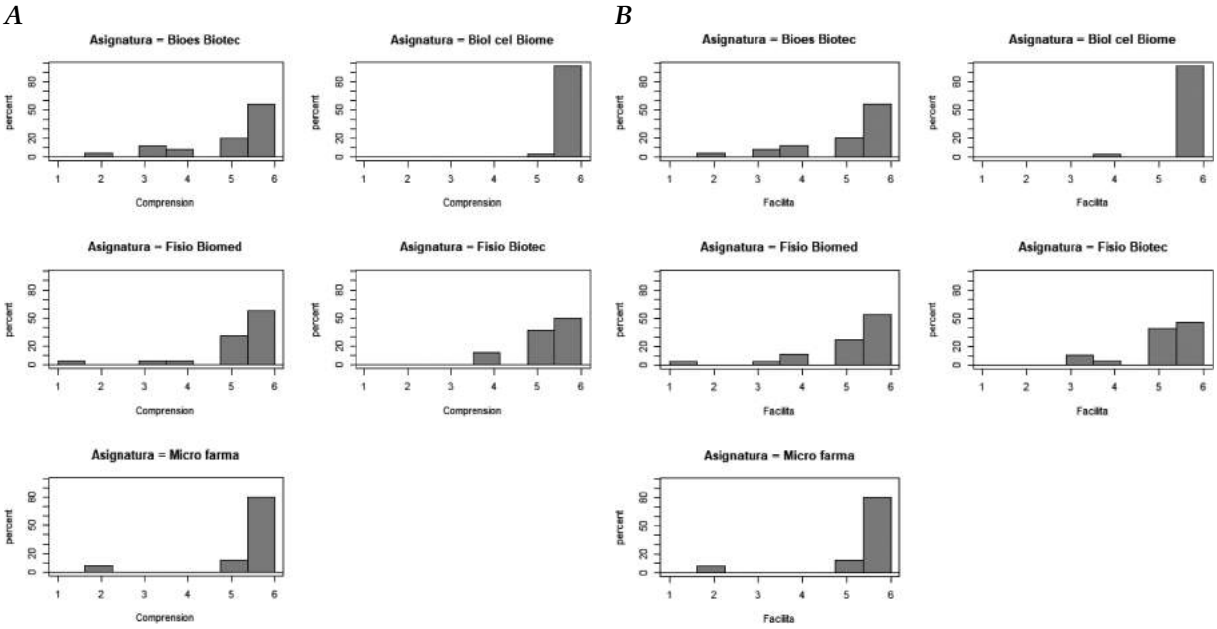


4.2. Percepción sobre el efecto del vídeo en su proceso de aprendizaje

A continuación, se ha analizado la percepción de los alumnos respecto a los vídeos como herramienta de aprendizaje (Figura 4). Al observar la distribución de las respuestas, lo primero que se observa es que los datos presentan una clara asimetría negativa en todos los casos, lo que indica que el grueso de las respuestas está claramente desplazado hacia los valores más altos de la escala de valoración. Este comportamiento se observa en todas las preguntas realizadas, lo que confirma la percepción positiva de los alumnos respecto al uso de estas metodologías.

Figura 4

Análisis de la percepción que tienen los alumnos respecto a si los vídeos les ayudan a comprender (A) y les facilitan el estudio (B) para cada una de las asignaturas



En particular, respecto a los vídeos como herramienta de aprendizaje se les preguntó: i) cómo les ayudan los vídeos en la comprensión de la asignatura y ii) cómo perciben que les ha facilitado el estudio, obteniendo una valoración media de 5.5 ± 0.9 y 5.4 ± 1.0, respectivamente, muy por encima del valor medio de la escala de valoración que es 3.5. En ambos casos, la mediana es 6, lo que significa que más de la mitad de los alumnos los han valorado con la máxima puntuación. Los valores numéricos analizados por asignatura se resumen en las tablas 2 y 3.

En todos los casos, la valoración media está por encima de 5, lo que indica que el tipo de asignatura y el grado no parecen ser los factores determinantes a la hora de obtener una determinada valoración. La moda es 6 en todos los casos, y cabe destacar las asignaturas de MF y BCBM en las que el 75% de los alumnos dieron la máxima puntuación como respuesta. De esta forma, se muestra que la alta puntuación otorgada a los vídeos como herramienta de aprendizaje no está sesgada por la asignatura y la percepción que tengan respecto a ésta en cuanto a dificultad o interés. Esto a su vez demuestra el potencial motivador de los vídeos en asignaturas menos atractivas para el alumnado.

Tabla 2

Resultados de media y desviación sobre el uso del vídeo para ayudar a la compresión de la asignatura gracias a los videos

Comprensión	BBT	BCBM	FBM	FBT	MF
Media	5.12	5.97	5.31	5.37	5.6
Est. Desv	1.2	0.17	1.2	0.7	1.0

Tabla 3

Resultados de media y desviación sobre el uso del vídeo para facilitar el estudio de la asignatura gracias a los videos

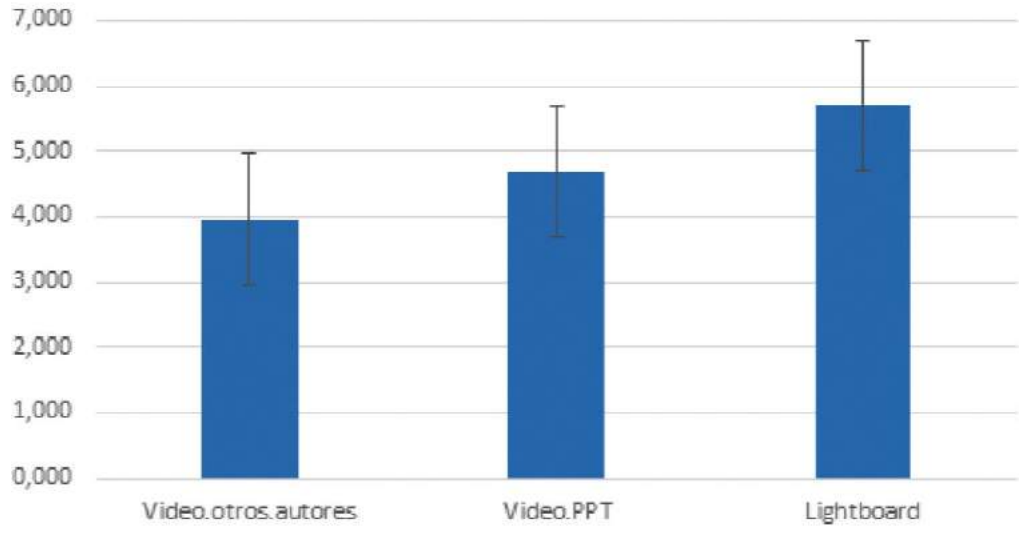
Facilidad	BBT	BCBM	FBM	FBT	MF
Media	5.16	5.94	5.19	5.2	5.6
Est. DesvDesv	1.2	0.34	1.20	1.0	1.0

4.3. Valoración de los vídeos realizados con lightboard respecto a otros formatos

A continuación, se muestra una comparativa de los distintos tipos de vídeos empleados y la valoración dada por los alumnos a los mismos (figura 5). Como se puede observar, la lightboard es el formato de vídeo mejor valorado por los alumnos, casi dos puntos por encima de los vídeos de autores diferentes a las propias profesoras.

Figura 5

Comparativa de la valoración de los alumnos de los distintos tipos de vídeos evaluados (vídeos realizados con lightboard, vídeos realizados con powerpoint y vídeos de otros autores)



El análisis de la distribución de los datos lleva a destacar el hecho de que la máxima puntuación se obtiene en el cuartil 1 para la lightboad, en el cuartil 3 para los vídeos de Power Point, mientras que, en los vídeos de otros autores, el valor 6 no se obtiene hasta pasado el cuartil 3 (tabla 4).

Tabla 4
Resultados de media, desviación y distribución de los datos sobre el uso de los diferentes tipos de vídeo y de las clases presenciales

Tipos de vídeos y clases presenciales	Media	Est. DesvDesv	0%	25%	50%	75%	100%
Vídeos con Ligtboard	5.69	0.65	3	6	6	6	6
Vídeos de otros autores	3.96	1.25	1	3	4	5	6
Vídeos con PPT	4.69	1.23	1	4	5	6	6

El análisis de los datos anteriores por asignaturas no muestra diferencias significativas entre ellas, lo que de nuevo demuestra que la buena percepción de los alumnos es independiente de la asignatura en sí.

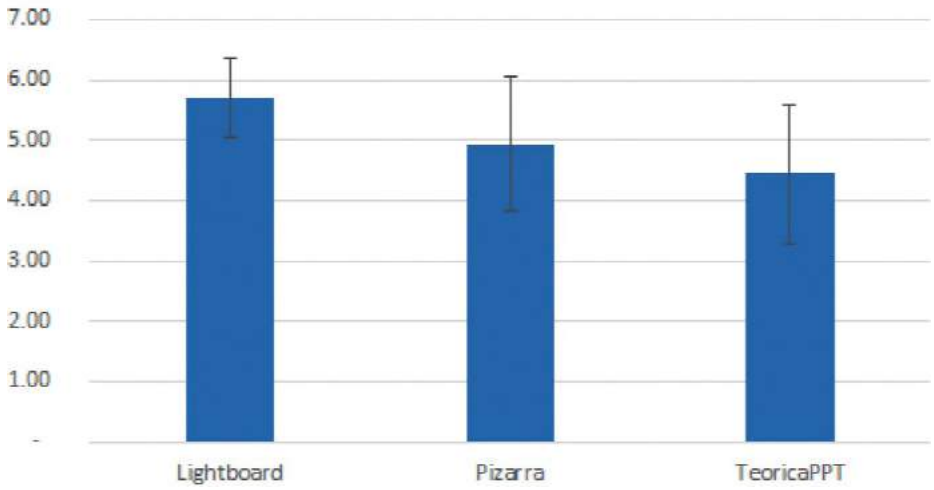
En los comentarios cualitativos son muchos los estudiantes que destacan que los vídeos con lightboard son más fáciles de seguir por su contenido gráfico, que aumentan su motivación, y que les ayuda a mantener su nivel de atención.

4.4. Valoración del uso de vídeos con lightboard frente a las metodologías empleadas en la clase presencial

Pensamos que uno de los motivos por los que los estudiantes prefieren los vídeos hechos con lightboard frente a otros formatos, podía ser por su similitud con las clases presenciales tradicionales en las que el profesor explica utilizando la pizarra. Para comprobarlo pedimos a los estudiantes que valorasen las clases presenciales explicadas con pizarra y con presentación de PowerPoint. Los resultados de valoración de las clases con pizarra fueron muy similares a la de vídeos con lightboard, superando a las clases con Power point, lo que apoya nuestra hipótesis.

Figura 6

Comparativa del uso de la pizarra o el PowerPoint en el aula frente al uso de los vídeos grabados con lightboard



El análisis de la distribución de los datos muestra que para las clases magistrales en aula utilizando PowerPoint, que es la metodología empleada por la gran mayoría de profesores universitarios, el valor 6 no se obtiene hasta pasado el cuartil 3 (tabla 5). La mejor valoración de las clases con pizarra y de los vídeos, creemos están relacionadas con el hecho de que éstas se adaptan mejor al ritmo de aprendizaje de los estudiantes y a que facilitan la relación entre las partes de información que componen el conjunto de contenidos impartidos en una clase, frente a la fragmentación de las diapositivas del PowerPoint y a la rapidez con la que el profesor suele explicar sobre una presentación en pantalla.

Tabla 5

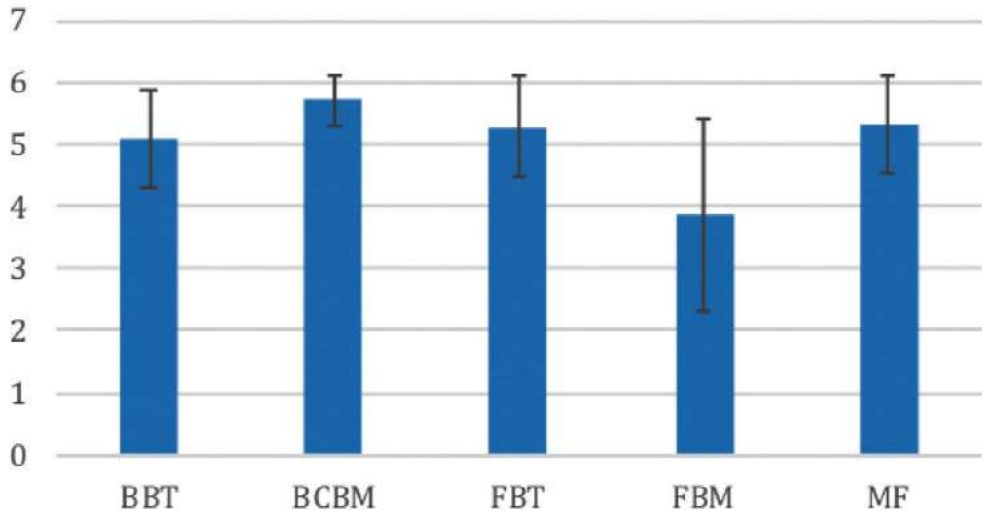
Resultados de media, desviación y distribución de los datos de las clases presenciales frente a los vídeos grabados con lightboard

Tipos de vídeos y clases presenciales	Media	Est. DesvDesv	0%	25%	50%	75%	100%
Vídeos con Ligtboard	5.69	0.65	3	6	6	6	6
Teóricas con PPT	4.44	1.14	1	4	5	5	6
Teórica con Pizarra	4.94	1.1	1	4	6	6	6

4.5. Valoración del uso de Edpuzzle para hacer los vídeos interactivos

Los estudiantes valoraron también el uso de Edpuzzle como herramienta para difundir los vídeos interactivos. En cuatro de las cinco asignaturas valoraron ésta por encima de 5 (Figura 7). En las valoraciones cualitativas varios alumnos comentan la utilidad de la herramienta para la autoevaluación de su comprensión durante el visionado de los vídeos, y algunos reconocen que refuerza su compromiso para verlo al saberse "observado" por su profesora. Las profesoras, por nuestra parte, confirmamos la enorme eficacia de Edpuzzle al permitirnos dirigir el visionado de los vídeos, comprobar su visionado, y, sobre todo, conocer las partes entendidas o no por los estudiantes antes de llegar al aula.

Figura 7
Valoración de Edpuzzle en cada asignatura

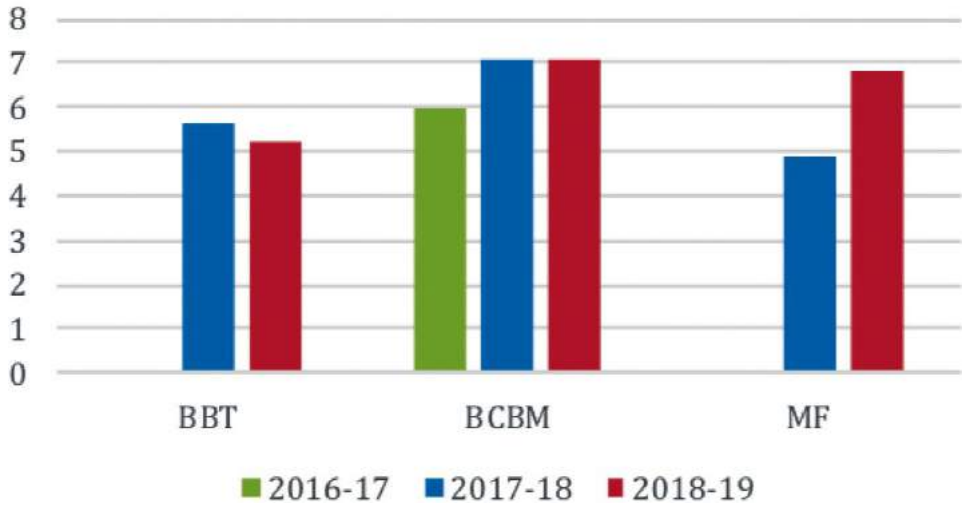


4.6. Efecto del uso de vídeos sobre los resultados académicos

Por último, hemos comparado los resultados académicos conseguidos los cursos en los que se han usado los vídeos con los obtenidos en años previos. En el momento de enviar este artículo carecíamos de los resultados finales por lo que hemos utilizado los de evaluación continua, calculando la media de las calificaciones obtenidas en los exámenes parciales en cada asignatura, excepto en FBM en la que se han utilizado los vídeos desde el principio de ser impartida. En la figura 8 se observa cómo la implementación de los vídeos y la posibilidad que estos ofrecen de gestionar la clase presencial de una forma más activa (dentro de la metodología FC) mejoran los resultados en BCBM (donde se empezaron a usar en el curso 2017-18) y en MF (donde se han usado en el curso actual). Esta mejora no sucede, sin embargo, en BBT lo que indica que la falta de interés y la percepción de facilidad por esta asignatura reducen la eficiencia de esta herramienta de aprendizaje, es decir, que es más difícil explotar todo el potencial del vídeo y la metodología asociada a su uso si la motivación y creencias iniciales del alumnado no son positivas.

Figura 8

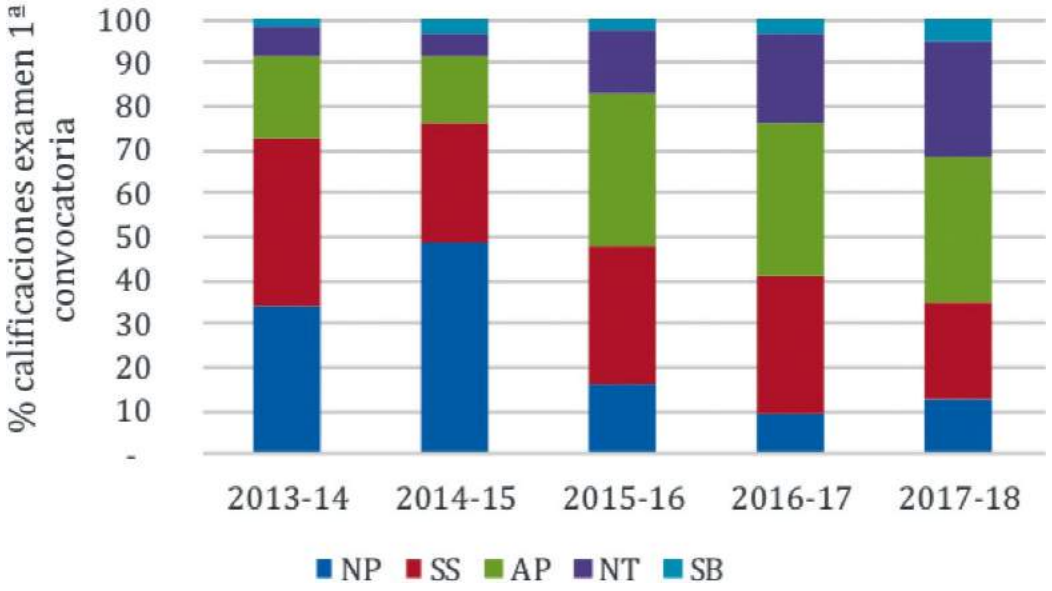
Comparación de calificaciones media de evaluación continua durante los cursos 2016-17, 2017-18 y 2018-19. El uso de vídeos se inició en el curso 2017-18 en la asignatura de BCBM, y en 2018-19 en BBT y MF



En la asignatura FBT comenzamos a utilizar vídeos para la docencia a partir del curso 2015-16, lo que nos ha permitido analizar los resultados finales. Como se muestra en la figura 9, el porcentaje de alumnos que superaron la asignatura en la primera convocatoria, así como las notas obtenidas, mejoraron llamativamente a partir del uso de los vídeos, y continúa mejorando debido probablemente a una mayor experiencia y un mejor uso de las herramientas de FC empleadas por la docente.

Figura 9

Comparación del porcentaje de calificaciones obtenidas en el examen de primera convocatoria de la asignatura de Fisiología Animal y Vegetal de 2.º curso de Biotecnología. El uso de vídeos en el contexto de la metodología del FC se inició en el curso 2015-16. NP: no presentados; SS: suspensos; Ap: aprobados; NT: notable; SB: sobresalientes



Es evidente que el uso del vídeo, fuera de una metodología como el FC o sin un buen trabajo del docente en el aula, no conseguiría obtener estos cambios en el aprendizaje, pero consideramos que suponen una herramienta esencial para que el cambio sea posible.

Con todo ello podemos concluir que el uso del vídeo en educación superior está muy bien valorado por los estudiantes como herramienta que mejora la comprensión de los contenidos y facilita su aprendizaje, independientemente de la asignatura que curse, siendo los vídeos de lightboard los mejor valorados. Esto está relacionado con una mayor valoración de la clase tradicional con pizarra. Además, el uso de vídeos en general mejora los resultados académicos, pero siempre que el alumno sienta interés por la asignatura y cierta percepción de dificultad. Para aquellas asignaturas que consideran menos interesantes será necesario repensar las estrategias de motivación.

Agradecimientos

Este trabajo ha sido realizado gracias a las Ayudas a la Innovación Docente y a las instalaciones y el personal del Instituto de Innovación de la Universidad Francisco de Vitoria.

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Beyond engagement: Learning from Students as Partners in curriculum and assessment

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Abstract

In the sage words of John Dewey "a problem well put is half-solved" (Dewey, 1938, p. 108) and underpins this paper. The problem: poor student participation in classes led to a rethinking of the learning environment and a trial of a Students as Partners (SaP) approach to increase engagement in a second-year biochemistry course. The initiative was implemented through a personal learning environment (PebblePad) but "learning rather than technology [drove the] innovations" (Overton & Johnson, 2016, p. 12). As partners in curriculum design, students were invited to choose two topics for the course and negotiate the number of student-generated questions as assessment for learning. Last, but foremost, students were given the opportunity to provide a reflection of their SaP experience. As a first foray into SaP, we aimed to be inclusive, collaborative and forge a connection with students to extend student learning and knowledge construction, with the student's voice front and centre in the decision-making. The collaboration, involving students contributing to the learning experience, coupled with the ability to negotiate the content of the course, provides empowerment or a "buy in" for students. The benefits of SaP to student learning and educator reconceptualization are documented, and a literature review provides further support for SaP. Using a digital platform enabled surprisingly honest, uninhibited and extensive student reflections on the partnership including: "*I liked the idea of putting the topic choices to a democratic decision, for the cohort to choose what would be the best for them to learn, and as to what would prove the most interesting for the entirety*" and "*Writing a multiple choice question was harder than I thought it would be, however, it did help highlight the topics I understand well, and those that may need improvement*". This trial of SaP exceeded expectations and demonstrated its value for student engagement and learning. Moving forward however, SaP as an approach, like academic development, involves iterative practices, informed by lessons learnt (Sheffield & Felton, 2018).

1. Introduction

In recent years there has been a significant decline in the number of students attending lectures and tutorial classes even when they are presented with evidence that attendance supports student learning. In addition, student attending classes rarely participate, share answers or engage in discussions (Armbruster *et al.*, 2009). When challenged, students have suggested that fear of failure and ridicule from their peers as the reasons for not wanting to engage, however they are willing to engage in strategies where they are anonymous to their peers and the teacher. Are higher education institutions responsible for lack of participation since the advent of lecture capture or lecture recordings? (see for example Edwards & Clinton, 2019). Have educators contributed to this problem, providing more and more resources to students without forcing them to seek, find, research and learn for themselves? Or are the current generation of students engaged in learning in different ways? These questions are contentious issues in higher education, although in recent years there has been an increasing trend to improve engagement by academics building partnerships with students, involving them in the teaching and learning process (Healey *et al.*, 2014).

Students as Partners (SaP) has been described as a meaningful collaboration between students and academics, a partnership, that emphasises shared responsibility and a reciprocal

approach, providing equal opportunities for all parties, although the responsibilities for each party may vary (Cook-Sather *et al.*, 2014; Healey *et al.*, 2014; Matthews *et al.*, 2018). The "SaP" approach is supported by the growing number of publications reporting the positive outcomes of involving partnerships, which included: increased engagement, improved relationships, enhancement in student learning and a sense of being part of a community (Cook-Sather *et al.*, 2014; Mercer-Mapstone *et al.*, 2017). Although there are many interpretations of SaP, conceptual models have been developed for academics to explore engagement with students through partnerships (Healey *et al.*, 2014). However, a partnership also requires negotiation where students are empowered to articulate their perspective, despite academic staff and students having different levels of expertise (Bovill, 2013). Furthermore, Matthews (2017) has outlined the elements that represent a genuine partnership practice, these involve: inclusive partnerships; power sharing; accepting uncertain outcomes; engage in ethical partnerships; and enable transformation through partnerships. Enabling students with a voice or a say in what is being taught and allowing them to share the responsibility by contributing to the learning is a powerful means of getting a "buy-in" from students and subsequently increased in engagement in learning (Cook-Sather *et al.*, 2014; Healey *et al.*, 2014). The literature on SaP has suggested that increased engagement and participation can be achieved through partnerships to improve student learning.

2. Students as partners implementation

The implementation of a SaP approach was in response to dwindling participation in a second-year biochemistry course (~120 students). Although this lack of engagement was not restricted to this course and is common in our institution as lectures are recorded and more resources placed online. Our strategy was to engage students by providing an opportunity to choose topics for part of the course through a democratic process, allowing them to create assessment and negotiating the terms of student-generated questions on the final exam as well as exploring engagement in the partnership through student reflection and evaluation. The SaP implementation was guided by the propositions outlined by Matthews (2017) that represented a genuine partnership between students and academics, outlined in Crough and Love (2019). At the same time as adopting a SaP approach, the university reduced the length of semesters and introduced PebblePad as a personal learning environment (PLE) providing funding for integration of the platform into courses. These factors were key considerations in the implementation of our SaP initiative, and PebblePad provided a platform for students to engage in the partnership and a safe environment for students to complete activities, negotiate the terms of the partnership and reflect on their experience.

2.1. Student topic selection

The introduction of shorter semesters in 2017 (from 13 weeks to 12 weeks) made it difficult to cover the current course content. Without a reduction in the content, students would struggle to digest, understand and makes sense of content heavy curricula, which may lead to cognitive overload. This led to a re-think of how to deliver the curricula and an opportunity to build staff-student partnership by allowing students to choose topics they wanted to learn for part of the course. In deciding the level of student control, we explored the Bovill and Bulley (2011) ladder of increasing participation from dictated curriculum at the bottom to total student control at the top, suggesting that staff-student partnerships should be towards the top rugs of the ladder. Although Bovill (2013) provides further clarification

of student contributions to curriculum as complex and contextual, and stated that it was not about giving students complete control but rather, allowing the appropriate level of control depending on context, level of study or in our case adapting the course for a shorter trimester.

In the context of our biochemistry course, we needed to find the right balance between the curricula required for knowledge progression for future second and third year courses, and relevant topics in biochemistry which could be chosen by students. To this end, curricula for course progression was maintained and students could choose two of the remaining six topics, and the topic selection was put to a democratic vote. In addition, we felt it didn't matter which topics were chosen as they were inter-related, and more importantly, we questioned whether students would be more engaged by choosing what they want to learn?

2.2. Student generated assessment and negotiation

One of the key elements in a staff-student partnership is active participation of students in their own learning (Healey *et al.*, 2014). Involving students in active learning is an excellent vector for increased engagement. Moreover, studies have shown that active learning can lead to an increase in student performance, regardless of the type or intensity of activity (Freeman *et al.*, 2014) and can reduce the achievement gap between disadvantaged and non-disadvantaged students (Haak *et al.*, 2011). Furthermore, reflecting of active learning can contribute to more meaningful learning by the creation of knowledge (Kolb, 1984). In addition, Deeley and Bovill (2015) have demonstrated the benefits of student participation in assessment design, as an active learning exercise, encouraging active engagement in assessment and learning. Engagement in the assessment can impact in several ways, it enhances student's ability to evaluate their own work and supports assessment literacy (Deeley & Bovill, 2015)

Understanding the importance of involving students in assessment development for learning provided the reasoning for incorporating assessment design in our staff-student partnership initiative. Students were provided with an opportunity to contribute to the assessment by means of designing multiple choice questions (MCQs) and negotiating how many student-generated questions should appear on the final exam. Each student designed one multiple choice question with the aid of scaffolding resources, and although their questions were not graded because the intention was to support assessment *for* learning. However, students were provided with feedback on their assessment design, with appropriate questions pooled and used in an online quiz as a study tool. Finally, students were able to vote on the number of student generated question which would appear on the examination paper. This involved choosing between a minimum of 10% and a maximum of 50% of the MCQs on the examination.

2.3. Student reflection and evaluation

As a first foray into SaP it was important to understand the student perceptions of the partnership activities and negotiations for improvement in future offerings of the course. Students were required to reflect on each activity to provide an insight into their motivation and engagement in the partnership. To ensure that reflections were authentic we asked for open-ended reflections requiring only a minimum of 20 words. In addition, an overall evaluation was conducted as one of the partnership activities and students were questioned

on whether the partnership increased their engagement; had an impact on their learning; the importance of contributing to the assessment and the course design; and if they were able to contribute further would it be toward the curriculum, the assessment or both.

2.4. Personal learning platform

The SaP initiative was supported by a mini-grant through the Griffith Sciences which adopted a bottom-up approach to complement the university-wide top-down approach to implementing the technology-enabled personal learning environment. PebblePad was chosen as an enabling technology based on its capacity to support and guide students to plan, share and provide feedback (Allan & Green, 2019). This staff-student partnership initiative was implemented in 2018 in conjunction with the personal learning environment to provide a space to complete the activities such as choosing topics, designing assessment, as well as reflect on the partnership. In this instance, the technology was not introduced to enhance learning but rather provide a place for negotiation and a safe environment for student reflection (Overton & Johnson, 2016).

3. Results and discussion

The evaluation of the partnership and the student reflections formed the basis of determining if this strategy had improved student engagement and participation in the course. Overall, 86.4% of students who participated in the SaP rated the partnership experience for the curricula and assessment design as useful (52%) or very useful (34.4%) and 80.5% indicated that they were engaged (32%) or more engaged (48.5%). Choosing topics to learn was important to students with 88.6% rating this as important (41.7%) and very important (46.9%). Although the importance of contributing to the assessment, while still rating highly (74.2%) appeared to be less important to students compared with choosing topics to learn (88.6%). When asked if they could increase their contribution to the partnership, 42.7% indicated that they would like to have more say in the choice of topics in the curricula over more input to assessment (17.7%), while 39.6% suggested they prefer an increase in both topic selection and assessment contribution. Interestingly, students appeared to engage in the partnership although there was no observed increase in participation and engagement in lectures and tutorials during the course.

Student reflections, on the other hand provide a direct insight into the ways in which students were engaged in the partnership. The level of engagement with reflections was surprising, with students providing extensive, honest and uninhibited accounts of their learning experience. We believe that the extensive reflections were the result of employing a personal learning platform which provided a safe environment to reflect without ridicule from peers. In addition, asking students to write a minimum of 20 words for reflections had a reverse psychological effect to the norm, with some students writing several paragraphs.

3.1. Engagement in topic selection

An in-depth analysis of the reflections on topic selection revealed that students chose topics that were interesting to them (70.5%); for example, "*Protein engineering would be interesting to see how you can modify proteins to perform specific/new functions.*" Others students chose topics that related to future employment/career (12.5%) or research (4.5%) such as,

"*I chose Protein therapeutics because it pertains to my goal of working in medical research*" and "*I hope to work in genetics after Uni, and feel like protein-DNA interactions will be quite relevant to my career.*" Choosing topics related to their degree program was the premise for some students (9.8%) - "*I chose these two topics because they sound really interesting and may relate to certain aspects of my degree program.*" Not surprising was the selection of protein therapies as the most popular topic with approximately 50% on the class enrolled in the Bachelor of Biomedical Science.

Students also indicated that they chose topics to expand their knowledge or improve their understanding, for instance; "*I chose Advanced Enzyme Kinetics because I did poorly in the first-year module and would like a chance to rectify that past failure.*" More importantly were comments suggesting they would learn better or be more engaged in topics that they enjoyed; for example, "*I will be more involved with my studies as I am learning about something that I enjoy*". Overall students were deeply engaged in their topic selections from the viewpoint of expanding their knowledge on a topic they chose and/or advancing their career development which is represented nicely in the student comment below.

> "I chose Protein Therapeutics because it pertains to my goal of working in medical research. It sounds like an emerging field and therefore might be really useful knowing something about it. I also like when theory is taught through case studies. I chose Advanced Enzyme Kinetics because I did poorly in the first year module and would like a chance to rectify that past failure... or maybe I just hate myself and want to suffer. I don't know."

3.2. Engagement in assessment design

The level of engagement in designing multiple choice questions (MCQs) was reflected in student comments on this exercise which portrait a multitude of ways in which this activity supported student learning. At first glance, the reflections revealed how difficult students found the task of designing MCQs, with 36% of the cohort providing comments that stated, "*more difficult than I anticipated*", "*harder than I previously thought*" and "*more stressful than I initially thought*." Furthermore, several students (10.1%) indicated that the most difficult aspect of the exercise was thinking of feasible incorrect answers, for example, "*Choosing what question I wanted to go with was easy, and then finding relevant correct answers were also easy but finding answers that were incorrect and not obvious was very difficult.*" Despite the difficulty, the majority of students, commented positively about the experience describing it as "*helpful*", "*valuable*" or "*enjoyable*". Aspects of genuine partnerships proposed by Matthews (2017) were also reflected in student comments, "*activities like these make me feel more involved in the course and increases my interest*" and "*a really nice way to make us feel that we are able to contribute to what we learn*".

The student reflections provided a direct insight into the learning practices being used in developing MCQs which included metacognitive learning, knowledge construction, reflective practices and self-regulated learning. There were several student comments representing each of these learning practices, a representative comment for each are shown in *Table 1*. Although not all students felt that the activity supported their learning, "*I don't think that designing a multiple choice questions helps me learn or revise the topics covered.*" In contrast, there were student comments that supported Deeley and Bovill's (2015) notion that developing assessment improves assessment literacy, "*I think this process will help us in choosing the correct answer when doing other multiple choice questions*" and "*the development of exam questions is a great way for students to better understand the process of how questions are*

made and how to better answer them". Interestingly, the most popular choice for the number of student-generated questions on the examination was 20% although we expected every student to choose 50%. Several student comments may explain why this was the case, for example "*I believe that the majority of students would not have a lot of experience in making or designing questions…I think we should leave it in the very capable hands of the lecturer*".

3.3. Engagement with the partnership

Student comments on the overall partnership between staff and student echoed the same sentiments already discussed in relations to student having a voice in curricula decision making and designing assessment for examination. The comments below clearly demonstrate that our partnership engaged student in learning although we didn't observe increased participation in tutorials or attendance of lectures.

> "I seriously loved the idea of actual students contributing to the assessment and I would love, love, love to see more of this in future courses. It's simple really because at the end of the day it is US who are learning the content and being able to have a say on what parts of that content we get to be assessed on is totally awesome."

> "Choosing a topic meant an increase in engagement and interest, and choosing questions for assessment meant I had to filter through what I know, didn't know and what gaps I had in my knowledge."

Table 1
Types of learning identified in student reflections on designing multiple choice exam questions, informed by Kober (2015)

Learning Type	Representative student comments
Prior knowledge shapes learning	My experience in developing a multiple choice question was good as it made me think deeply about the knowledge I already have and how I can apply this knowledge and turn it into a question, with a correct answer.
Knowledge construction	The ability to write your own multiple choice question was a great learning experience as it was a great way to reorganise notes and study for the different modules in a new way, which lead to learning more conceptually instead of rope [sic] learning new information
Metacognition	I have enjoyed creating a multiple choice question for the exam as it allowed me to look over topics I had found overwhelming or difficult in detail and pose questions for study that I may have otherwise struggled with in an exam setting
Self-regulated learning	Generating a multiple choice question that can be both challenging and requires thinking time for the person trying to answer the questions can be both daunting and time-consuming. During this exercise I had to go over some notes from lectures and textbooks. From this, I was able to reinforce the method of gel electrophoresis. I tried my best to use it in an applicable situation. I found the exercise worthwhile and a good study revision.
Reflective practices	I think it was great to go back and look at the content in the first 3 Modules it helped me to reflect on the topics I need to go over again. Activities like this make me feel a more involved in this course and increases my interest.

Understanding how students are engaged in the course is an important lesson for academics as we shape the structure of future course offerings, focused on the way this current generation of student are engaged in learning. In addition, due consideration should also be given to uncomplimentary comments from students, particularly with respect to reciprocity and equity, which are key elements of genuine partnerships. One student commented on this issue, "*I feel like the student topics weren't long enough or in depth enough … but if the choice we get isn't equally weighted against the others it kind of defeats the purpose*". While other student's felt empathy for peers whose topics were not chosen, stating, "*some students would not be happy if none of their topic choices were picked, as I was with enzyme kinetics*". However, other students indicated they liked the idea of putting the topic choices to a democratic decision.

4. Conclusion

The students as partners approach may not have increased attendance or participation in lectures and tutorials but provided an insight into the different and extensive ways students are engaging in learning. The SaP initiative provided many opportunities for the educators to learn from students through their engagement, feedback and insightful reflections. Building on such learnings and our own reflective practices, the second iteration of this course in 2019 includes a further three questions in the PebblePad student workbook. Not only do we hope this further enhances student engagement but also provides insights into student learning that we can share through the Scholarship of Teaching and Learning.

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T3

Gero eta ugariagoak diren esperientzia berriak, ikaskuntza sakona eta esanguratsua sustatzen dutenak

Emerging and unpublished experiences that foster significant and deep learning

Experiencias emergentes e inéditas que propician aprendizaje profundo y significativo

Fotografía participativa y reflexión. Una propuesta innovadora en el practicum de Magisterio de la Universidad de Cantabria

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Abstract

In this paper we present a formative innovation in higher education developed with students of the three subjects of practicum, in Primary and Infant Education Degrees (University of Cantabria). The practicum innovation that we are analyzing moves towards new ways of reflective and participatory initial teacher training. We start from two training masts that are put into play through the writing of a teacher diary: the exploration of the biography and the methodology of the Photovoice. More concretely, the proposal is articulated according to the following phases: definition of a question of inquiry; biographical exploration; inquiry using photovoice; shared narration. Methodologically, this work is based on the pillars of the qualitative tradition and, more specifically, within the evaluation case study. The participants are practicum students of the 2017/2018 academic year and the information gathering techniques are: seminars, which were recorded in audio and later transcribed; analysis of documents, specifically the teacher diary written by each student and the photographs taken; observations and field notes. The analysis of the experience allows us to draw some results, among which we highlight: the chosen questions of inquiry are heterogeneous, although most flourish from direct observation of classroom activities (eg conflict resolution, methodology and materials) and respond to the preferential interest to solve practical problems of the day to day; biographical exploration shows a great potential to begin to mobilize the implicit ideas about these issues, while photovoice becomes a valuable strategy to promote dialogical reflection; finally, the initial writing of the teacher diary tends to be merely descriptive, one-dimensional, with a low level of interpretation, and those that incorporate social and political criteria for reflection are also scarce. We conclude by reviewing the value of the strategies used to mobilize deeper and pluridimensional reflections.

Resumen

En esta comunicación presentamos una innovación formativa en educación superior realizada con estudiantes de las tres asignaturas de practicum, en los grados de Educación Primaria y Educación Infantil (Universidad de Cantabria). La iniciativa de practicum que analizamos camina hacia nuevas maneras de formación reflexiva y participativa. Partimos de dos mástiles formativos que se ponen en juego a través de la escritura de los diarios: la exploración de la biografía y la metodología de la Photovoice o fotografía participativa. De manera más concreta, la propuesta se articula atendiendo a las siguientes fases: definición de un asunto de indagación; exploración biográfica; indagación utilizando la fotografía participativa; narración compartida. Metodológicamente, el trabajo se asienta en los pilares de la tradición cualitativa y, más concretamente, dentro del estudio de caso evaluativo. Participan los alumnos de practicum del curso académico 2017/2018 y las técnicas de producción de información son: seminarios, que fueron grabados en audio y posteriormente transcritos; análisis de documentos, concretamente el diario de prácticas elaborado por cada estudiante y las fotografías tomadas; las observaciones y las notas de campo. El análisis de la experiencia permite dibujar algunos resultados, de entre los que destacamos: los asuntos escogidos son heterogéneos, si bien la mayoría florecen de la observación directa de las actividades de aula (ej.: resolución de conflictos, metodología y materiales) y responden al interés preferente de resolver problemas prácticos del día a día; la exploración biográfica muestra una potencialidad grande para comenzar a movilizar las ideas implícitas sobre dichos asuntos, mientras la fotografía participativa se erige en estrategia de valor para promover la reflexión dialógica; finalmente, las escritura inicial del diario tiende a ser meramente descriptiva, unidimensional, con un nivel bajo de interpre-

tación, siendo además poco abundantes los que incorporan criterios sociales y políticos a la reflexión. Concluimos reseñando el valor de las estrategias utilizadas para movilizar reflexiones más profundas y pluridimensionales.

1. Introducción

En este trabajo presentamos una innovación universitaria realizada con estudiantes de las asignaturas de practicum de los Grados de Educación Primaria y Educación Infantil (Universidad de Cantabria). Asumimos que las prácticas significan un momento crucial donde los alumnos pueden reflexionar en la acción y ponerse "en juego en primera persona" (Sierra *et al.*, 2017, p. 676). Nuestra propuesta formativa se alinea con el paradigma de la práctica reflexiva (Beavers *et al.*, 2017; Wong, 2016; Zeichner, 2005) y se vehicula a partir de la exploración de la biografía, la escritura de los diarios y la metodología de Photovoice.

Respecto a la reflexión biográfica, apuntamos la relevancia de la biografía de los futuros profesores en la configuración de sus teorías pedagógicas (Saiz y Susinos, 2017; Clandinin y Connelly, 2000; Williams y Grierson, 2016), de modo que resulta fundamental destinar espacios en su formación inicial para comprender y explicitar dichas biografías escolares, que contribuyan cuestionar ciertas prácticas tradicionales de enseñanza en las que, por lo general, los estudiantes de magisterio se han socializado.

Por otro lado, la escritura brinda grandes oportunidades como herramienta de auto-indagación y reflexión, pues permite construir ideas y expresar la experiencia encarnada (Sierra *et al.*, 2017). En la experiencia formativa que analizamos, la escritura se utiliza para dar sentido, teorizar y producir conocimiento (St. Pierre, 2007), posibilitando relatar la experiencia, pero, sobre todo, hacer experiencia (Contreras y Pérez de Lara, 2010).

Finalmente, la Photovoice emerge como una metodología de investigación participativa cuyo valor reside en sus posibilidades de dar voz a aquellos que tradicionalmente son excluidos en los procesos de sociales y de investigación (Wang, 1999; Prins, 2010), si bien cada vez aparece más utilizada en los contextos formativos, como recurso educativo alineado con la reflexión y la mejora (Parrilla *et al.*, 2017). En nuestra experiencia, los maestros en formación hacen uso de las cámaras fotográficas para registrar procesos, situaciones, relaciones u objetos significativos en el marco de su estancia prolongada en la escuela. Posteriormente, las fotografías realizadas se convierten en objetos de análisis y narración a través de estrategias de diálogo, reflexión, crítica e intersubjetividad (Novak 2010).

2. Metodología

La investigación desarrollada durante el curso 2017-2018 se afinca metodológicamente en los pilares de la tradición cualitativa (Flick, 2014) y, más concretamente, dentro del estudio de caso evaluativo (Simons, 2011).

Hemos utilizado instrumentos de producción de datos que permiten un tratamiento cualitativo de la información: seminarios grabados en audio y posteriormente transcritos; análisis de documentos, concretamente el diario de prácticas elaborado por cada estudiante y las fotografías tomadas; las observaciones y las notas de campo.

Las fases de desarrollo de la experiencia se inspiran en los movimientos que fundamentan la propuesta: la indagación biográfica, la narración escrita que se materializa en el diario y la photovoice.

1. Definir el asunto de indagación: cada participante selecciona libremente el asunto de indagación a partir de los siguientes interrogantes: ¿qué llama mi atención durante estas prácticas? ¿Por qué lo hace? ¿Qué conozco sobre este asunto? ¿Qué preguntas me realizó sobre el mismo?
2. Indagación biográfica: una vez definido el asunto, se propone a los alumnos realizar una narración en clave de análisis autobiográfica-crítica. Esta narración biográfica es libre, cada participante decide el modo en el que quiere presentarla: atravesando todas las etapas educativas; a través de incidentes críticos, etc.
3. Toma de las fotografías: una vez finalizadas las fases anteriores, se inicia la indagación sobre el dilema a partir de fotografías. Cada participante realiza fotografías que recojan elementos clave de los asuntos pedagógicos elegidos y realiza una primera narración interpretativa individualmente.
4. Narración compartida: finalmente se configura un espacio de diálogo compartido donde cada participante pone a disposición del grupo el documento generado que recoge las imágenes seleccionadas y la narración de las mismas. Durante diferentes sesiones, cada asunto de indagación es sometido a diálogo, negociación y análisis compartido. Las imágenes se convierten en elicitadoras del diálogo, la interpretación y la reflexión conjunta, ofreciendo la oportunidad de que emerjan nuevas preguntas y modos de analizar la realidad como resultado de un proceso intersubjetivo de interpretación.
5. La construcción de narrativas escritas: los docentes en formación acompañaron las imágenes realizadas sobre la realidad objeto de indagación con una narración en clave interpretativa que se materializa en la elaboración del diario. Este documento se presenta como resultado del proceso anteriormente descrito y, por tanto, se ve enriquecido por las ideas, sugerencias, interpretaciones y análisis llevados a cabo en el seminario de trabajo.

3. Resultados

3.1. ¿Qué asuntos pedagógicos preocupan a los maestros en formación?

Resaltamos la amplia heterogeneidad de intereses pedagógicos que atesoran los estudiantes. Encontramos algunos dilemas que emergen de la observación directa de las actividades de aula (actividades complementarias, metodología y materiales) y otros se centran en aspectos educativos más amplios, implicando a más miembros de la comunidad educativa y que están ligados a la construcción de un proyecto educativo de centro (la atención a la diversidad). Por su parte, otros dilemas, como la infantilización de los contenidos escolares, incorporan criterios sociales y políticos a la reflexión sobre la actividad educativa que permiten un análisis de corte más ideológico. Sin embargo, advertimos también que hay asuntos (el referido a los procesos de cambio escolares es un ejemplo) que, si bien podrían ofrecer una excelente oportunidad de reflexión, en su formulación inicial se concretan únicamente en aspectos extracurriculares (infraestructuras, horarios, etc.). Por último, es necesario destacar la elección de algún tópico (resolución de conflictos) que responde al interés preferente de los maestros en formación de acceder a un conjunto de técnicas que les permitan desarrollar una enseñanza "eficaz" y resolver problemas prácticos del día a día (Mule, 2006; Saiz y Susinos, 2017).

En cualquier caso, la reflexión a partir de asuntos o dilemas pedagógicos ha evidenciado un potencial grande para favorecer la capacidad de análisis y reflexión y, sobre todo, para abrir posibilidades al pensamiento y a la discusión colectiva (Sierra *et al.*, 2017).

3.2. El papel de la biografía escolar en la definición de los asuntos pedagógicos

Algunos estudiantes han expuesto como causa de la elección del tópico, la indagación sobre un asunto que aflora de su biografía escolar o de la formación académica en la Universidad, es decir, una preocupación que ya atesoraban antes de su llegada a los centros de prácticas:

El tema que he elegido es muy específico. Dado que soy alumno de la especialidad de Educación Física y he tenido la suerte de que mi tutor en el colegio sea profesor de esta área, me ha parecido oportuno hablar de ello aquí. Voy a hacer especial incidencia en el uso de espacios y materiales para la práctica de gimnasia.

También descubrimos caminos en la exploración biográfica que son inversos: partiendo de lo que actualmente han observado y les ha interesado de su periodo de practicum, han reflexionado sobre cómo ese asunto pedagógico se configuraba en su historia escolar.

En mi experiencia escolar, el material que más utilizábamos era el libro de texto. Para cada asignatura teníamos un libro y nos basábamos exclusivamente en él. Eso no daba cabida a que nosotros nos planteáramos preguntas sobre lo que aprendíamos, solo nos centrábamos en lo que los libros decían. Además, teníamos un cuaderno para asignatura en el que realizábamos las actividades del libro. También teníamos los cuadernillos del "Rubio" de problemas y caligrafía.

No obstante, hemos descubierto que esta indagación retrospectiva se manifiesta para ellos dificultosa y, en algunos casos, han mostrado resistencias para acometer esta tarea. Indagando sobre los motivos, encontramos que algunos estudiantes no logran avanzar más allá de lo evidente o superfluo en las relaciones entre la experiencia biográfica y la configuración de teorías pedagógicas, probablemente porque exige un nivel alto de reflexión. En cualquier caso, las dificultades buscan superarse a través de un espacio de diálogo inicial sobre la formulación de la preocupación, de la conexión con referentes teóricos y del propio proceso de indagación con imágenes, que abordaremos posteriormente.

Respecto a los diarios, encontramos que un número no pequeño de estudiantes tiende a realizar reflexiones superficiales sustentadas únicamente en la evidencia de su experiencia, pero no en la teoría o la investigación. Este tipo de reflexiones suelen formularse de manera meramente descriptiva, con un nivel bajo de interpretación, valoración o crítica.

Como podemos apreciar en la pared donde los niños pueden chocarse se han puesto unas almohadillas que son muy blandas y que hacen que el golpe se quede en nada. Además de esta forma con el color rojo es llamativo para los niños que la simple pared blanca. Decir que la medida me parece genial ya que las posibilidades de que un niño se golpease eran a mi parecer bastante altas.

Sin embargo, tampoco son exiguos los estudiantes que se aproximan a su dilema desde un nivel de reflexión pedagógica, situándose ante el tópico desde una posición exploratoria, abierta y orientada a la mejora de la práctica. En abundantes casos, algunos alumnos que comienzan con reflexiones en niveles superficiales y técnicos transitan hacia este tipo de reflexividad más profunda gracias a las experiencias dialógicas (en los seminarios, a partir de la propuesta de Photovoice) y también al feedback de los diarios que hemos realizado las supervisoras. Un ejemplo es el siguiente:

Quiero hablar sobre la influencia de las editoriales en los colegios. Desde hace años se observa una creciente influencia de las empresas que se dedican a realizar el material utilizado por los alumnos en las escuelas. "El libro de texto ha sido uno de los elementos omni-

presentes en la escuela; un dispositivo tan consustancial a una forma de entender el proceso de enseñanza-aprendizaje que quizá algunos profesores no sabrían qué hacer sin él, se encontrarían desvalidos, no sabrían qué enseñar ni cómo hacerlo" (Trilla Bernet, 2002). Algo similar está ocurriendo en las escuelas de infantil, en este caso, en mi colegio, he presenciado como comerciales de diferentes editoriales acudían al centro para presentar los materiales del próximo curso e intentar venderles. El uso de estas herramientas me parece excesivo en esta escuela, ya que veo que esto está creando profesoras que están a falta de creatividad y es porque no lo están trabajando.

3.3. Las fotografías como herramientas de reflexión y elicitación de diálogo

Mirar a través de la lente de la cámara, facilitó que el alumnado dedicase un tiempo a la observación y reflexión de la vida del aula, acciones ambas con escasa presencia en un desarrollo del practicum en el que inician la acción e intervención desde los primeros instantes de su estancia en el centro.

En la foto, podemos observar un grupo de cinco niños. Todos ellos están haciendo una ficha de caligrafía; excepto uno, que ha terminado su tarea y está esperando a que acaben sus compañeros. En esta ocasión, este niño lleva un rato esperando, pero no es la primera vez que le pasa. Le ocurre todos los días y en todas las actividades que hacemos.

En general, las imágenes permitieron visibilizar aquello que, a través de otros lenguajes, se ha mantenido invisible. Al mismo tiempo, se vio reforzada la idea de la fotografía como una herramienta compleja para registrar y visualizar sus ideas, preocupaciones e interpretaciones que incluso nos descubre nuevos caminos de ver, interpretar e imaginar alternativas (Wang y Burris, 1994).

Por otro lado, podemos resaltar la preferencia del alumnado por realizar imágenes que recogen gráficamente los diferentes elementos sobre los que quieren indagar. No encontramos fotografías abstractas que hagan uso de la metáfora o del símil para abordar los temas.

4. Conclusiones

Esta propuesta se sustenta en el poder del conflicto para generar movimiento (Sierra *et al.*, 2017), en tanto en cuanto la tensión y la disonancia movilizan la acción, el cuestionamiento, la búsqueda de respuestas y de alternativas de actuación, que se transforman en posibilidades de aprendizaje y de desarrollo profesional. Por ello nuestra iniciativa se vertebra alrededor de una situación dilemática que los estudiantes tienen que confrontar reflexivamente y, posteriormente, en el diálogo generado a partir de diferentes estrategias (escritura, exploración biográfica y photovoice) con grandes posibilidades en tanto en cuanto permiten situar la mirada en lugares que normalmente pasan desapercibidos, así como transitar hacia otras interpretaciones cuando miramos desde un espacio más distanciado y desde otras lentes.

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Sentipensar: hacia el descubrimiento de nuevas formas de incluir el cuerpo en los procesos formativos

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Abstract

The aim of our research is to build new spaces of thought from the bodily sensations in the process of creation of the Bachelor´s Degree in Social Education (TFG) The sensations that arise from our own experiences are a source of knowledge in the reflexive and action processes that students perform in university education. The TFG represents the opportunity to unfold the learning by inquiry, that is, to make a creation of your own that arises from a concern designing innovative action projects within a relevant topic. We have developed exercises based on body focus to deepen learning by inquiry. Using qualitative tools to collect data, we have obtained significant results regarding the relevance of students' own experience, as well as the function of body sensations in reflective processes.

Resumen

El objetivo de nuestra investigación es construir nuevos espacios de pensamiento desde las sensaciones corporales en el proceso de creación del Trabajo Fin de Grado (TFG) en la titulación de Educación Social. Las sensaciones que emanan de las propias experiencias son fuente de conocimiento en los procesos reflexivos y de acción que realiza el alumnado en la formación universitaria. El TFG representa una oportunidad de desplegar el aprendizaje por indagación, es decir, de realizar una creación propia que surja desde una inquietud diseñando proyectos de actuación innovadores dentro de una temática relevante. Hemos desarrollado ejercicios basados en el enfoque corporal para profundizar en dicho tipo de aprendizaje. Mediante herramientas cualitativas para la recogida de los datos hemos obtenido resultados significativos respecto a la relevancia de la propia experiencia del alumnado, así como de la función de las sensaciones corporales en los procesos reflexivos.

1. Marco teórico: indagar en las sensaciones

De las experiencias del alumnado emanan las inquietudes respecto a una situación socioeducativa para llegar a problematizarla con el fin de transformarla (Dewey, 1998; Freire, 2008). El Aprendizaje Basado en la Indagación (Inquiry Based Learning, IBL) (Peñaherrera, Chiluiza y Ortiz, 2014) nos ofrece la oportunidad de que el alumnado cree sus propias preguntas, indague para buscar las respuestas y éstas sean nuevas e innovadoras. Construir puentes entre la experiencia del alumnado (prácticas, experiencias educativas y vitales, ...) y el espacio simbólico (palabras, teorías, discursos, reflexión) nos lleva a tener en cuenta las sensaciones corporales que surgen de las experiencias, y que los procesos de indagación ayuden a descifrar el conocimiento que hay en las vivencias personales. Con ello, podemos afirmar que indagar es experimentar una interrelación entre dos estados: por un lado, la incertidumbre resuelta, por otro, la incertidumbre que queda por resolver (Wagensberg, 2008). Eso nos lleva a poner el foco en la visión que defiende que en los procesos de enseñanza-aprendizaje la parte intuitiva y sensorial también tiene una función primordial:

> Transformative learning does this to an unusual degree. It engages and involves the whole person, and affects change in Deep levels of values and belief throught a process of re-perception and re-cognition. It is not the just a matter

> of intellectual or conceptual learning, but engages our emotional and intuitive selves as well. (Sterling, 2004, p. 56)

La propia Universidad del País Vasco (UPV/EHU) promueve el modelo IKD (Ikaskuntza Dinamikoa eta Kooperatiboa (Aprendizaje Dinámico y Cooperativo) que pone énfasis en que los estudiantes sean los dueños de su aprendizaje y sean formados de forma integral, flexible y adaptada a las necesidades de la sociedad:

> "El sentido y la misión de la universidad deben acompasarse con las dinámicas sociales y culturales propias de cada época. Del mismo modo que el mundo ha cambiado extraordinariamente en las últimas décadas, el currículum general de la universidad del siglo xxi también debe evolucionar para adecuarse a las demandas de una sociedad en continua transformación y caracterizada por la incertidumbre. La misión de la enseñanza superior consiste en formar personas conscientes y sensibles a lo que ocurre en su entorno, que sean capaces de adaptarse a los cambios continuos y que puedan responder de forma creativa y ética a problemas nuevos." (UPV/EHU, 2019, p. 4)

Por ello debemos subrayar que en los procesos de enseñanza-aprendizaje el alumnado comienza el camino con experiencias, vivencias, percepciones y modos de actuar propios (Doi, 2008). Todo ese entramado de conocimientos suele estar sin articular, es decir, sin haberlo pasado al espacio simbólico de la palabra. La mayoría de las veces la sensación que atendemos en nuestro interior en relación a un asunto de nuestra vida personal o profesional resulta confusa al principio. Incluso puede resultar vaga o no discriminable (Barceló, 2015), pero sentimos el cuerpo de manera diferente. Una característica de esta sensación es que la experimentamos como un todo complejo que abarca muchas ramificaciones (Barceló, 2015; Gendlin, 1983, 1997). Por ello atender a las sensaciones a la hora de desarrollar un TFG nos brinda un espacio de indagación:

> "(La sensación) es como una multiplicidad de aspectos que se manifiestan en una sola sensación. Esta sensación constituye un dato significativo de nuestra experiencia y hay que dejarla venir porque surge novedosamente cuando atendemos el centro de nuestro cuerpo." (Barceló, 2015, p. 171)

La experiencia contiene todo ese material disponible, aún no simbolizado, pero sí palpable como una presencia interna sentida, como una sensación que definimos provisionalmente con la palabra algo (Barceló, 2015). Para ello nos tenemos que situar en esa sensación de frontera, para prestarle atención un tiempo a algo que es sentido, que es poco claro por el momento, y que es desde donde se pueden crear procesos de indagación.

2. Diseño e implementación del proyecto

El siguiente estudio de caso llevado a cabo con cinco estudiantes de cuarto curso del Grado de Educación Social tiene por objetivo principal el conocer la percepción individual del alumnado participante en el proyecto de investigación SentiGRAL (Proyecto de Innovación Educativa 2018/2019, UPV/EHU) respecto a la construcción de nuevos espacios de pensamiento desde la sensación corporal.

El proyecto se articula sobre dos herramientas creadas por Gendlin (1983, 1997, 2009): a) TAE (Thinking at the Edge, Pensando desde el Borde); y b) Focusing. La primera tiene por

objeto buscar una forma de pensamiento basada en la vivencia corporal que provocan las ideas:

> "TAE is a structured method of elaborating a bodily felt sense, something vague, hard to describate yet feeling important, by interacting with verbal symbols as to create and express new meaning." (Tokumaru, 2011, p. 4)

El TAE consta de ocho pasos en los que, desde las experiencias significativas del alumnado, vamos hacia la simbolización de las mismas (Aguilar, 2011). Ofrece un camino para dejar que irrumpan nuevas y variadas formas de lenguaje espontáneo, para diferenciar significados desde las sensaciones, para facilitar que aparezcan estos significados en múltiples direcciones y para posibilitar que surjan nuevas relaciones de conceptos provenientes de las sensaciones significativas que experimentamos. Las fases de TAE son las siguientes:

— Preparar el cuerpo.
— Dejar que se forme una sensación sobre un tema o experiencia.
— Expresar esa sensación.
— Expandir.
— Entrecruzar.
— Desplegar.
— Comprobar.
— Recibir y proyectar.

En Focusing (Gendlin, 2009) se prepara el cuerpo para que se crea una sensación corporalmente sentida respecto a un tema o situación y, desde ahí, darle significado para su desarrollo, en este caso, en el TFG. Hemos hecho uso de dicha técnica, sobre todo, en momentos de bloqueo del/la alumna durante el proceso y desarrollo del trabajo.

2.1. Fases

Hemos desarrollado seis sesiones de trabajo con cada alumno/a secuenciadas en tres fases: a) *Formulación del problema o pregunta-motriz*. Mediante la utilización de TAE y Focusing ahondamos en esa sensación que trae el/la alumno/a respecto a una temática que tiene que ver con alguna experiencia suya, poniendo la atención en eso que hay de "novedoso" o "nuevo" en la vivencia. El TAE es eminentemente creador, por lo que al final de esta fase el/la alumno/a encuentra su pregunta-motriz que hace que el trabajo adquiera dirección, sentido e intensidad. Esta fase dedica dos o tres sesiones con cada alumno/a; b) *Desarrollo del marco teórico y/o diseño e implementación de la intervención.* Aquí se abren a su vez, dos caminos: por un lado, puede comenzar a construir el marco teórico y, por otro, empezar a diseñar e implementar (metodología e intervención) aquello que va a llevar a cabo para responder a la pregunta-motriz, bien sea un estudio bibliográfico, un diseño de intervención en un barrio, una intervención en un recurso educativo en medio abierto… Al mismo tiempo, en esta fase se definen los objetivos y los instrumentos metodológicos que va a utilizar: (cuestionario, entrevistas, estudio etnográfico…). El esquema expansión-cierre y las herramientas TAE y Focusing son también la base de esta segunda fase de la secuencia. Esa relación dinámica sensación-símbolo es lo que hace de guía a la hora de elegir las ideas fundamentales del marco teórico, los objetivos, las actuaciones del diseño, las acciones y la recogida de datos; c) *Creación de los resultados y discusión*: cuando los estudiantes responden a la inquietud que ha surgido desde su experiencia.

2.2. Herramientas de recogida de la información

A través de la metodología cualitativa hemos trabajado con los siguientes instrumentos para la recogida de datos: a) entrevista en profundidad al final del proceso con cada alumno/a; b) diario de seguimiento del docente; y c) sesiones de trabajo del grupo de investigación

3. Resultados y conclusiones

En la siguiente tabla presentamos sintéticamente la categorización de los datos:

Table 1
Síntesis de los resultados

Categorización	Análisis de datos				
	Alumno/a 1 (A1)	**Alumno/a 2 (A2)**	**Alumno/a 3 (A3)**	**Alumno/a 4 (A4)**	**Alumno/a 5 (A5)**
Relación experiencia-teoría	Valorar la experiencia de cada uno como motor del TFG hace que el desarrollo del trabajo adquiera fuerza y sentido.	Empezar desde la sensación es algo novedoso. Indagar es intentar descifrar eso que sientes que sabes.	La actitud de respeto y comprensión del tutor hacia el alumno/a es fundamental en este proceso. Partir de una idea que es significativamente sentida para uno mismo ha dado un valor diferente al trabajo	El proceso de indagación hace que se relacionen la experiencia y la teoría en un diálogo común.	Respetar, escuchar y valorar el sentir ha personalizado el trabajo.
Herramientas didácticas: Ejercicios TAE/ Focusing de la guía	Los ejercicios de expansión y cierre han dado sentido al proceso y han hecho que la relación entre la experiencia y lo que expresaba fueran encajando.	Han sido muy valiosos. Han ayudado a ver qué hay en cada paso del TFG, por qué tenía sentido y nexo con la pregunta-estructurante.	Con estos ejercicios ponemos el foco en uno mismo. De dentro hacia afuera.	Sirve para ubicarme, afinar y ordenar el trabajo. Los ejercicios de abrir y cerrar son muy efectivos.	Ir de una idea a otra hasta que encaje la que sientes significativamente.
Proceso de indagación	Desde el principio he conectado con el sentir y con mis experiencias. Indagar es averiguar. Trabajar así es un poco a la inversa: partimos de nuestra experiencia y luego lo sustentamos con teoría, autores.	El trabajo ha sido personal, lo subrayo. Las reflexiones respecto al TFG y su desarrollo han surgido de uno mismo. Indagar es "darse cuenta" de la pregunta del TFG, es sentir cómo se le encuentra una respuesta…	Indagar es poner palabras a lo que sientes que sabes. Sentir claramente cuál ere la cuestión que quería resolver en el TFG.	Los pasos de la guía me han servido para pasar de la incertidumbre a la seguridad.	Reflexionar desde el sentir es necesario para que el trabajo sea tuyo, para personalizarlo.

Podemos destacar que:

Hemos construido un **proceso de indagación creativo.** Emerger y dar forma a las inquietudes del alumnado que surgen de las vivencias propias hace que problematicen un tema del ámbito educativo, lo hagan suyo e inicien el proceso: *"Indagar es ayudar a definir la idea, es decir, la pregunta que intentaba responder. La pregunta me dirigía"* (A4). El proceso ha hecho que el alumnado personalice el TFG y el proceso de indagación en el cual mirar(se) y en el que las sensaciones ayudan a desplegarlo: "*He conseguido hacer una conexión con todo… el mirar cómo estás tú: sensaciones, ideas… partir de unas preguntas para mirar la sensación y hacer conexiones con la teoría e información para profundizarlo. A mí me ha valido"* (A1).

Prestar atención a todo ese bagaje experiencial que trae el alumnado y darle status de conocimiento ha generado una **sensación "de algo nuevo"**: el proceso de indagación ha ido de dentro hacia fuera, descubriendo los matices de las propias sensaciones y experiencias, así como ir afinando la respuesta de la pregunta inicial del trabajo. "*La importancia que tiene la experiencia, que la inquietud para hacer el TFG nazca desde las tripas (..)* (A2).

A su vez, todo eso sentir ha supuesto que el alumnado personalice su TFG y lo identifique como suyo: "*Lo de las tripas y el sentir me ha ayudado. (…) Esto me ha servido para anclar la pregunta: es esto lo que quiero hacer i es esto lo que quiero resolver"* (A5).

Las herramientas (TAE, Focusing) han ayudado en el proceso de indagación en tres direcciones: carácter vectorial del trabajo, crear redes conectivas entre el sentir y la teoría, y reflexionar desde el sentir. La pregunta estructurante ha ayudado a dar sentido a la indagación, hace que tome **carácter vectorial**: una clara dirección (necesidad de responder a la pregunta) e intensidad (el alumno siente que el aprendizaje vendrá al responder a la pregunta): *"A los educadores nos cuesta mucho darle nombre a lo que hacemos y en este proceso me ha ayudado el resonar en el cuerpo lo que ponía por escrito"* (A2). *"La pregunta es mía (…) Me ha servido para discriminar la información que era significativa para mí y cuál no, la que era válida. Gracias a la primera fase (crear la pregunta) sabía qué información quería buscar"* (A5). "*Las ordeno en base… mi pregunta."* (A4)

Los ejercicios de despliegue y cierre han traído un fluir entre lo personal y lo teórico profundizando en la indagación donde se han entrelazado aspectos importantes y significativos del TFG con sus propias reflexiones, ideas y líneas de acción: *"Creo que así se genera nuevo conocimiento. Algo nuevo (…) "El proceso de abrir y cerrar desde la sensación a mí me abrió los ojos"* (A2). **Han contribuido a crear puntos de vista nuevos**: "*Lo que me salía de dentro, estuviera bien o mal yo lo apuntaba y luego me ayudaba a elegir. Eso ha sido muy intenso, me han salido cosas que no pensaba que me iban a salir. A se ejercicio (expansión/cierre) le puse el nombre de `patinaje´"* (A4). Al fin y al cabo, la idea de *patinar*, creada por una alumna es una metáfora muy adecuada para describir el proceso de indagación y los instrumentos que hemos utilizado: al patinar, divagamos de un lado para otro deslizándonos, buscando un lugar en el que encaje eso que estamos buscando, en nuestro caso una idea, una acción, una propuesta… En las siguientes palabras queda muy bien reflejado: "*De una idea me ha llevado a otra idea y de ahí a otra y de ahí, a la final, a la que sentía que era la válida. Las ideas que al principio no parecían que tenían relación… ves que se relacionan"* (A4).

El impacto sobre algunos/as alumnos/as es destacable, al transferirlo a procesos autónomos de aprendizaje. *"Abrir y cerrar lo he utilizado en todas las fases. Es más, he cogido un hábito: antes de escribir algo, escribo a mano las ideas que me brotan, para luego ordenarlas…"* (A4).

Podemos concluir que poner atención a las sensaciones corporales ayuda a profundizar los procesos de indagación, ya que el alumnado se involucra en su propio proceso formativo. Las sensaciones corporales son fuente de conocimiento para trasladarse de la incertidumbre a la certeza (Wagensber, 2008) y así poder seguir el proceso de indagación.

Es fundamental utilizar herramientas didácticas basadas en el enfoque corporal: nos abren un espacio didáctico significativo a la hora de desarrollar procesos de enseñanza-aprendizaje. Por lo tanto, creemos necesario introducir el cuerpo en el itinerario formativo de los futuros profesionales.

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Does your personal tutoring system engage your students? The Three Es of SSM (Efficacy, Efficiency and Effectiveness)

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Abstract

Higher Education (HE) is increasingly attempting to provide more personalised approaches to students' experiences of learning, teaching and assessment. A central contradiction however, in many UK HE institutions, can be the students' expectation of personalised academic support within a mass higher education system. Mixed messages may reach students: 'You will be looked after at every step in a personalised way' vs. 'You are on your own and need to become an autonomous, independent learner'. In many HEI, Personal Tutoring (PT) is seen as an important part of providing this personalised experience, but institutions may communicate poorly to staff and students about the intended purpose of PT. What should students make of this? For students, is the culture they are entering about their own vision of learning, or someone else's? What are the actions needed to improve this situation? Soft Systems Methodology (SSM-Checkland and Poulter, 2006) has been used in education as an action research-based theory of change, though relatively rarely in HE settings for institutional wide systems change. This paper applies the methodology to the messy situation of the purpose of PT, by considering one UK HE institution, including its students and staff, as a 'learning system' that can explore, examine, problematise itself and generate its own solutions. This paper thus reflects on how student contribution helped to develop a more rounded picture of insights gained into this complex activity and on the degree of success of using SSM as a change model . There is evidence to suggest that significant and deep learning resulted from this institution-wide learning experience.

1. Introduction and Background

The explicit enactment of change using specific theories of change in a UK Higher Education Institutional (HEI) context seems to be relatively rare (Trowler, Fanghanel and Wareham, 2005; McGrath *et al.*, 2016), but perhaps a situation that could usefully be addressed. For example, Turner and Gosling (2012) looked at changes to reward structures for teaching excellence in HEIs and concluded that without a secure foundation in an explicit theory of change, even a well-resourced initiative will have limited success. However, there are some notable exceptions that have explored institutional level change informed by theory as a practical approach for managers for example, Trowler, Hopkinson and Comerford-Boyes (2013).

Perhaps even more rarely do educational developers, as a learning community, explicitly use theories of change to enable whole institution learning around curriculum development, relying instead on the processes of negotiation that allow academic staff to adapt to new ideas. This is partly due to the place of academic development in the institution where it may not be structurally positioned for decision-making. Gosling and Turner, (2015) tracked initiatives designed to create change, where funding was distributed to fifteen universities to set up Centres for Excellence in Teaching and Learning (CETL) during the early 2000s. Where this was successful, it was largely through alignment (perhaps by chance) with an institution's strategic objectives, structures and the agendas of key senior managers. The authors noted that academic development units tended to work well with these initiatives.

This paper describes an instance where two academic developers used an explicit change model (Soft Systems Methodology-SSM) and applied this to a well-known 'problematical situation' in HE: the purpose of personal tutoring (PT) in students' HE experience. It is problematical in that PT is an attempt by HEIs to increasingly personalise approaches to student's experience of learning (eg Popovic and Baume, 2016), alongside the central contradiction of messages around student expectations in a mass higher education system: *You will be looked after at every step in a personalised way* vs. *You are on your own and need to become an autonomous, independent learner*. A further layer of complexity is that institutions may communicate poorly to staff and students about the intended purpose of PT. What should students make of this? For students, is the culture they are entering about their own vision of learning, or someone else's? What are the actions needed to improve this situation?

As academic developers working in a Higher Education Funding Council for England (HEFCE) funded project to explore 'Interventions for Success', we considered the activity of personal tutoring within a UK HEI using SSM (Checkland and Poulter, 2006) as an explicit and appropriate model of change given its use in a wide range of applications and contexts, although relatively underused in a higher education context (Hanafizadeh and Mehrabioun, 2018, p. 186).

Figure 1
Soft Systems Methodology (after Checkland and Poulter, 2007)

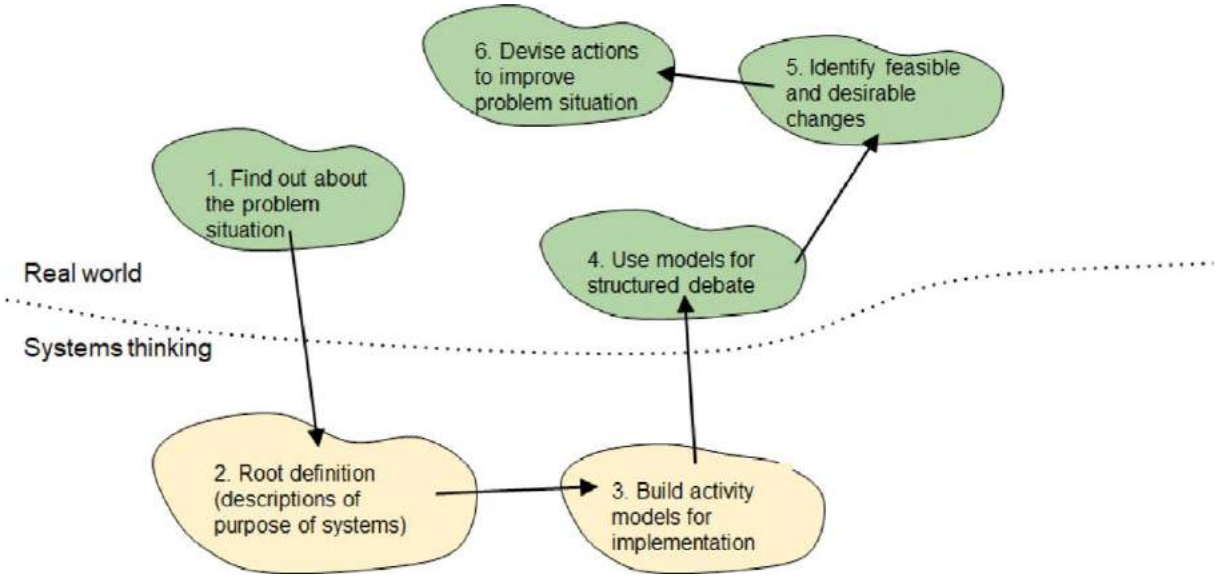

Figure 1 shows the 6 stage process of SSM and may also be recognisable by those familiar with other kinds of action research. In SSM a systems thinking approach means that taking action in the real world is separated (by the dotted line in Fig 1) from the systems thinking for problem solving stages (2 and 3 in Fig 1). In our case, stage 2 and 3 used the insights gained from stage 1 to propose a purpose for personal tutoring and an activity system that could be used to implement it. The purpose statement and activity system were used for a structured institutional wide conversation (Stage 4) that led to the identification of desired changes (Stage 5), and culminating in a plan for rollout of the new approach to personal tutoring including design of the evaluation mechanisms to be used (stage 6).

For the purpose of this paper it is necessary to unpack stage one a little further. SSM methodology identifies four ways of finding out about the situation at hand, and three of these are important to our discussion of the effectiveness of an SSM approach in this context (Checkland and Poulter, 2006, pp. 27-37):

- Analysis one - the intervention itself has three key components, the SSM methodology, practitioners using the methodology, and the problematical situation to which SSM it is being applied;
- Analysis two - the social including the different roles concerned with the situation, norms or established behaviours within the organisation, and values or the criteria by which individuals are judged; and
- Analysis three - the political expressed through power relationships derived from formal structures and the informal establishment of reputation built up through 'events' over time.

This paper does not seek to provide a full description of the application of Soft Systems Methodology, instead focussing on two aspects:

1. gathering student and staff views to inform the first stage of defining the problematical situation (Figure 1 Stage 1); and
2. the design of evaluation mechanisms (part of Stage 6).

It is important to note that although the SSM approach is presented as a sequential process, in reality there are numerous iterations, overlaps and stages running in parallel.

The problematic situation was explicated by work undertaken in the early part of this project when we, as practitioners, talked to students and academics about their experience of personal tutoring. Many staff and students were unclear about the purpose of personal tutoring and the value that it brings, leading to some seeing it as a low value activity, and something that tutors may feel ill-equipped to perform. This lack of clarity about the purpose makes it suited to the approach of SSM which is particular effective when addressing messy situations that as a starting point require a systematic structuring of the problem at hand as precursor to the system itself 'solving' the problem.

Using models of purposeful activity and an idealised purpose statement, an institution-wide conversation was instigated and pursued. This resulted in some 'actions to improve' to arrive at an accomodation of views that are "desirable, given the outcomes of using models to question the real situation" and whic ahre also "culturally feasible" (Checkland and Poulter, 2007, p10). This included the development of a cross-institutional framework for evaluation of personal tutoring. Following the SSM methodology, this evaluation focuses on assessing the efficacy, (did it do what it was designed to do) efficiency (did it do this with minimum resource) and effectiveness (did it achieve overarching purposes).

In the following sections, the empirical work undertaken to inform stage 1 of the SSM is first described and then the success of the use of SSM as a change model is discussed.

2. Empirical Work

Empirical work was carried out to inform Stage 1 (exploring the problematical situation) as this stage also implicates an evaluation of Stage 6 - actions to improve). Below we describe first the initial work with students; secondly a departmental evaluation of their

new improvements; and finally two focus groups to allow students to imagine different possibilities for tutoring, unconnected with any existing systems. These focus groups were conducted by the SSM practitioners and were therefore unconnected with any departmental system of personal tutoring.

2.1. Gathering Students' Views

During the exploration of the problematical situation, work with students included 130 informal conversations and some elicitation of written texts from students about their experiences of personal tutoring. This work indicated that student perceptions of both positive and negative experiences focussed on communications, and structures. Positive experiences noted the importance of tutor and student attitudes and tutor knowledge. Both positive and negative experiences noted the eventual affective result. Negative experiences focussed on the perceived value of the activity of personal tutoring and the perceived lack of sincerity of an offer of 1:1 care in a mass higher education system.

Thus one insight gained was that students can clearly see when the personal tutoring offer is insincere: perhaps because staff are not committed to the role; or because it is under-resourced relative to its stated aims. Senior managers have unrealistic expectations about what personal tutoring can achieve in terms of meeting institutional key performance indicators around student progress and employability post university. However, there are some positives with some students believing that meaningful interactions between students and their tutor can enable students to feel supported, motivated and sometimes, inspired and this works when student believed that tutors care, want to help and value their tutees. Perhaps most striking from a systems perspective is the lack of institutional or local ways of evaluating personal tutoring : instead the efficacy and effectiveness of personal tutoring systems is largely left in the realm of anecdote and personal opinion.

2.2. Departmental Level Evaluation Activity

Three departments in the university have been selected to work further within this cycle of evaluation and action to improve and are considered here as works in progress. We describe below some of the evaluation work in one of these departments.

The department has held focus groups with both students and staff in order to evaluate a new model of personal tutoring, whose purpose was to make improvements in 'transition, progression and engagement' as well as towards student 'autonomy and success'. This purpose is in line with institutional priorities.

The focus group questions indicate that the priority of the PT system co-ordinator is gaining feedback on the system of tutoring - that is, the change that this person instigated towards an embedded curriculum model. Staff are clearly going to be interested in whether they have the 'right' system as there will be a range of staff opinion about perceived operating issues such as amount of work involved, curriculum 'space' given over to student tutoring activity and so on. Questions for student focus groups included genuine questions about what students individually would like as a model of personal tutoring as well as guided questions towards student evaluation of the embedded nature of the personal tutoring system used.

2.3. Student Focus Groups

In order to provide one further element in the explication of the problematical situation, students were recruited to focus groups and asked to imagine an idealised PT experience perhaps reflecting on influences of technology on students' learning preferences in a connectivist world (Siemens, 2005).

We started with the question:

For students, is the culture they are entering about their own vision of learning, or someone else's?

Students were provided with a basic outline of the soft systems method and shown some examples of rich pictures. We explained that the problematical situation was that we seem to have a university system without flexibility or personalisation to individual needs and wants. They were then asked to draw a picture of themselves learning. In one focus group there was no further constraint while in the second, students were explicitly asked not to include university learning. We asked students to consider how they do learning in the real world.

The pictures and resulting discussion of these suggested that the students in the focus groups (naturally a small and biased sample) valued highly the face-to-face interaction provided by a physical campus that seemed to afford opportunities for engagement not just with course-related content but sports and friendships. We were surprised at the almost entire lack of enthusiasm for online interaction or activity, despite the advantages of flexibility proposed. There was also a degree to which, as we considered the outcomes of these focus groups, students seemed unable to escape from the vision of learning that a university (with all the years of tradition that the term is laden) appears to dictate.

3. Discussion of Success of Use of SSM as a Change Model in Higher Education

3.1. SSM as a Change Model

The case above offers a partial explanation of the use of SSM in a UK university as a theory of change. As academic developers and SSM practitioners, we view personal tutoring as a purposeful activity and, therefore, as a system that can be influenced to operate differently through a process of adaptation to environmental change (Checkland and Poulter, 2007, pp. 7-8). Secondly, inline with SSM ideas, we see that individuals will view situations differently depending on their previous experiences and, arguably, on traits they inherit. Finding an accommodation of views amongst stakeholders about what changes are to be made to improve a problematic situation is the central challenge to successfully applying SSM.

3.2. Analysis and Reflection

As a means of understanding how effective the SSM approach was, an analysis was undertaken of the meetings, communications and presentations that the two practitioners undertook over the life of the project. A filtering process led to the identification of 21 key communications. These were reflected on using the ways of finding out (the three analysis

introduced above) to evaluate the success of use of SSM as a change model in this particular context, and on how student contribution helped to develop a more rounded picture of the complex activity of PT.

3.3. Analysis One - The Intervention Itself

As practitioners, although familiar with SSM methodology, we have never fully implemented the methodology through all of the stages. Where SSM is used in higher education, it is often only as an approach to problem structuring rather than as a way of bringing about change.

Two key pieces of learning stand out. The first was how effective SSM was for institutional learning across the different hierarchies within the institution and how widely the conversations spread. The conversation approach provided an effective forum for finding an accomodation of views about the purpose of PT and the design of a PT framework, including the approach to evaluation. Given the social context described below, reaching out to all corners of an organisation to get meaningful engagement can be particularly challenging in HEI. Secondly, the significant amount of effort required by the practitioners for 'nurturing' the process along. This included targeting and refining communications, spotting opportunities and openings, and heading off 'side-swipes' from other institutional projects that could have unintentionally derailed the initiative.

3.4. Analysis Two - The Social

Faculty and departments of the HEI have very differing sets of norms and established ways of working. For some departments, there can be a tradition of rejecting initiatives that come from the centre, whilst for others there is a more compliant acceptance of doing what they are asked to do to the best of their ability. This was a fundamental challenge identified early in in the project.

Historically, a particular set of constraining requirements for PT imposed ways of working across different discipline and subject areas that have very different professional and academic traditions. For example, the (historic) requirement to have 5 meetings per year, recording attendance, and a focus on dealing with poor attendance in lectures, etc. The revised PT Framework (PTF) allowed for multifaceted approaches so long as they have a clearly articulated purpose, are planned, evaluated and lead to actions to improve where required. It is believed that by giving back responsibility to academics in strong and established culture of academic freedom (Karran, 2009), better sense will be made of personal tutoring at this local level. This systems thinking approach is explained by Seddon (2008, 82), with a core argument that imposed targets (a command and control approach) can result in a *de facto* purpose being created which in turn constrains the methods developed to undertake the work at hand. For example, in the case of PT, it is possible that five meetings becomes the purpose of PT, reducing the activity of the tutor to one of monitoring attendance.

3.5. Analysis Three - The Political

The formal organisational structures in HEIs tend to be established around groups of cognate subject areas (faculties, departments, schools, etc) with a central core that provides

services (library, finance, HR, etc.) and coordination of the activities of the whole led by the Vice Chancellor and other senior members of staff. In our case, a matrix model is employed around issues relating to education. A centrally located Pro-Vice Chancellor Education exerts influence through through faculty line managed Heads of Education.

As SSM practitioners, we operated in this contect seeking to ensure that the different stakeholders were satisfied that they were getting enough of what they needed by way of PT through the accommodation of views. The centre wanting consistency, and the relatively autonomous sub units wanting the freedom to take purposeful actions in the way that they thought best. Putting students front and centre of the project greatly strengthened our hand in their discussions with colleagues, as we had a sound evidence base on which to challenge unfounded assumptions and propose a reasoned way forward. Increasingly in UKHEIs, students views are taken seriously as the funders of the University.

4. Summary

As practitioners, we believe that using SSM methodology gave us a powerful set of tools and way of thinking to navigate a successful project through the different challenges faced. However, as the project draws to a close, we will not be be in a position to defend the PT space, and ultimately the impact on student experience will come down to how well the checks and balances designed into the PTF perform.

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Perceptions from students and non-profit organizations after using the service-learning methodology in a Marketing Degree course in Business & Management

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Abstract

In this paper, the authors will show the results of a research study carried out with students and non-profit organizations, after using the service-learning methodology in a Marketing Degree course in Business & Management.

The aim of this methodology is "to involve students in organized community service that addresses local needs, while developing their academic skills, respect for others, and commitment to the common good" (DiPadova-Stocks, 2005).

"Service learning is appropriate for all business disciplines; marketing in particular is well-suited to service learning" (Easterling & Rudell, 1997), due to the interest in marketing for social causes (Klink & Athaide 2004), and, especially, "small businesses and nonprofits, in particular, often lack internal marketing capabilities and do not have the financial resources to outsource them" (Mclntyre *et al.*, 2005).

According to the literature, when service learning is used in business schools, both businesses and students benefit (Tucker *et al.*, 1998). Businesses benefit from the physical and intellectual inputs of students. Students benefit in a number of ways: enriched skill base, improved learning, development of new contacts with stakeholders, better understanding of community needs, and increased sensitivity to community responsibility. Students also may improve their leadership, human relations, time management, and presentation skills (Mclyntre *et al.*, 2005).

In this paper, the authors share the results of the research conducted aimed at measuring the perception of value received by non-profit organizations who participated in this particular experience of service-learning courses in academic years 16/17 and 17/18; and explain the opinion of some of the students that collaborated in this experience.

1. Introduction and Context

In this paper the authors present the findings of the evaluation carried out by non-profit organizations, following the use of the service-learning methodology in a Marketing Degree course in Business & Management. The aim of the methodology is "to involve students in organized community service that addresses local needs, while developing their academic skills, respect for others, and commitment to the common good" (DiPadova-Stocks, 2005). "Service learning is appropriate for all business disciplines; marketing in particular is well-suited to service learning" (Easterling & Rudell, 1997) because of marketing's interest in social causes (Klink & Athaide, 2004), and especially "small businesses and nonprofits, in particular, often lack internal marketing capabilities and do not have the financial resources to outsource them" (Mclntyre *et al.*, 2005).

2. Service-Learning. Concept And Benefits

2.1. Service-Learning Concept

In recent decades, service-learning has been increasingly included in the university academic programs. "Service learning can be defined as credit-based educational experiences in which students: 1) participate in an organized service activity that meets identified community needs and 2) reflect on the service activity in such a way as to gain further understanding of course content and a broader appreciation of the discipline, as well as an enhanced sense of civic responsibility" (Bringle & Hatcher, 1996).

2.2. Benefits of Service-Learning

"When service learning is used in business schools, both businesses and students benefit" (Tucker *et al.*, 1998). "Businesses benefit from the physical and intellectual inputs of students. Students benefit in a number of ways: enriched skill base, improved learning, development of new contacts with stakeholders, better understanding of community needs, and increased sensitivity to community responsibility. Students also may improve their leadership, human relations, time management, and presentation skills" (Mclyntre *et al.*, 2005).

3. Application and Methodology

The service-learning methodology has been applied within the subject "Marketing of specific sectors". In this assignment, students are invited to develop a real marketing plan for a non-profit organization. In this paper the authors present the results of the research conducted to measure the perception of value received by non-profit organizations and discuss the perception of some of the participant students. Given the exploratory nature of this research, a qualitative methodology has been followed, choosing the in-depth interview as a tool for obtaining information. Using this technique, the interviewer guides the conversation, but concedes space for the interviewee to express his or her own views (Taylor & Bogdan, 1987). For this study, the authors have conducted 9 face-to-face interviews with the directors of the non-profit organizations involved, as well as 15 interviews with students. All interviews have been taped, with the signed agreement of each participant, for further transcription and analysis. The interview script has been developed after reviewing academic literature.

4. Results

In this section, the authors present the main results of the research.

4.1. Perceived Value by Organizations

a) *Question 1. Motivational elements*

This question is very relevant as it allows us to know why each community decided to participate in this project. The reasons given by the interviewees are very varied, and are described in the following paragraphs:

— The specific characteristics of the methodology: "Their proposal appeared original and different. It is very interesting that the university supports such initiatives", said one of the interviewees (Organization No. 1). "There is no tradition of collaborating with the university, but we liked the philosophy of collaboration", adds another organization (Organization No. 4).
— The need to perform marketing tasks. As the head of one NGO quotes, "We are a very young organization and we need to draw up a marketing plan. But we don't have the resources to do it by ourselves" (Organization No. 6). Other added: "We believed we need a marketing plan and that it might be a good idea to have it prepared at the university", and remarked that "they are high-level students, certainly capable of bringing something" (Organization No. 7).
— The existing link between the student and the community. One of the organizations noted, "It was the university that made contact with us since a student knew us" (Organization No. 3). In other cases, the reason for the selection was "The social cause we stand for turned out to be very interesting for one of the students" (Organization No. 9).

b) *Question 2. The students' contribution*

In order to deepen the community's perception of the experience, the authors wanted to know the real value brought by the students. In this case, it is very relevant to understand whether the work done by the students has had a positive, useful and differential impact on the community. The organizations interviewed do perceive that the students have provided them with added value, and they agree that the contribution has been positive: "The analysis they made was correct and the work was wonderful" (Organization No. 1); "On a theoretical level the work was splendid" (Organization No. 5); "The marketing plan gave us many ideas" (Organization No. 4), expressed several participants. Within this contribution it is worth highlighting the following comment: "The marketing plan is printed, and we consult it frequently" (Organization No. 9).

c) *Question 3. Main advantages*

At this stage, the participating organizations have pointed out the following main advantages:

— The final work done by the students. "We couldn't have done a marketing plan any other way. The proposals are included in our current communication plan" (Organization No. 3).
— The creation of a community-university relationship: "We would love to repeat the experience", said one of the interviewees (Organization No. 2).
— The collaborative links that have been generated "We are still in contact with the students, they still want to help", added one of the participants (Organization No. 1).

d) *Question 4. Main constraints*

Knowing the main obstacles of the process is crucial, since knowing it can contribute to the improvement of the application of the methodology. Through the interviews, we have been able to identify the following impediments:

— The lack of time for students to delve significantly into the organization. One of the interviewees points out: "They worked with data but lacked contact with the reality of

the residences. It is difficult to find time to visit residences, but it always contributes to understand our work and enhances the experience" (Organization No. 2). Several organizations commented that the experience had been short and should be extended in time: "To give continuity to the experience would be interesting" and "It would be perfect if the experience was not so compacted and was more prolonged in time" (Organization No. 9).

— In addition, the interest in involving students in the implementation of the designed project is noted: "We would have liked the students to have been able to help implement the plan" (Organization No. 6).
— Most of the staff of the organizations are volunteers and work outside of it, which in some cases complicates the communication with the students: "Since they were all volunteers, there was no one who was able to manage them 100%" (Organization No. 4).

e) *Question 5. Competences developed*

According to the perception of the organizations, the main enriching factors for the student who participates in a service-learning experience would be:

— It improves their understanding of the needs of the local community. One interviewee adds, "The loneliness of older people had not been raised by a student ever before" (Organization No. 2).
— They are aware of other ways of working: "We are all volunteers, they discover people who work altruistically. They learn that there is something beyond the economic salary" (Organization No. 7).
— Their social commitment increases. One interviewee sums it up as follows: "Young people do not collaborate with social causes; this initiative brings them closer to these realities. The students come down to reality" (Organization No. 8). Another interviewee adds, "Young people are used to a paternalistic government, but that is unsustainable. The problems of society are everyone's problems, young people's too", and he concludes, "Through these experiences, the students acquire a greater social commitment" (Organization No. 4).

Students are also able to improve their skills and their theoretical-academic learning because, as they point out from one of the organizations, "All organizations need money to exist, in that sense I believe that the theoretical work is the same as in any other company" (Organization No. 3); and they add from another, "Sometimes management issues are forgotten in NGOs. NGOs should be governed by the same management criteria as private companies. That's why I think this initiative is very useful for many NGOs" (Organization No. 5). In this sense, as one of the interviewees points out, BA students have a lot to contribute: "In an NGO, both solidarity and management are necessary" (Organization No. 9).

4.2. Value Received by Students

The questions are very similar to those used in the previous section, although focused on the students' perspective.

a) *Question 1. Motivational elements*

We ask this question to find out the main reason why the student has chosen a specific organization. It is very interesting to understand what elements motivate students when it comes to social causes. In a way, it helps us to connect with them in a deeper way. The answers collected in this section focus either on the existence of some previous link ("We knew someone in the organization", Student No. 3), or by pure coincidence in the choice ("The choice was entirely fortuitous, just the day before we started, we received a flyer about this NGO", Student No. 6).

b) *Question 2. Main advantages*

The main advantage is connected with the real usefulness of the work done ("You make a marketing plan that is going to be useful", Student No. 10). Moreover, it seems that they are aware that without their help the organization would not have been able to do it: "The organization did not even know that marketing plans existed" (Student No. 8); "There are no marketing people in the organization" (Student No. 2); "They have no money to carry out marketing actions" (Student No. 9). Another positive aspect that they highlight is the profile of the organizations, in terms of size ("When an association is small, it gives the impression that you are contributing much more", Student No. 11) and have easy access to it ("We had contact with the decision makers in the organization", Student No. 15). Finally, and comparing it with other methodologies used in the university, they point out that: "It is totally different from what we had seen before" (Student No. 3); or "We saw another business reality" (Student No. 4).

c) *Question 3. Principal obstacles*

It is very relevant to point out that the perception of the students about the obstacles coincides with the perception of the organizations. In the words of one of them, "They were all volunteers, it was difficult to contact them because they were not there" (Student No. 9). Another participant adds that "The problem was to adapt the marketing actions to their limited budget" (Student No. 6).

d) *Question 4. Competences developed*

At the end of the interview, the interviewer asked the students about their perception of the competencies developed after the service-learning experience. In their opinion, they are capable of identifying benefits in all three dimensions: In the social field, one of the participants points out that "It is the only subject in which we have done something solidary" (Student No. 8), and another student states that "We do not collaborate with any social cause, this has been the first time" (Student No. 12). In the academic field, an interviewee assures that "Every organization needs a marketing plan. We learned a lot, we had to tell our plan to the person in charge knowing that it was really going to happen" (Student No. 5). On a personal level, one student states that "We were very pleased to be able to have our own initiative and to have our ideas be listened to" (Student No. 14).

5. Conclusions

The most relevant findings of the research should be shared in order to broaden the knowledge about the value of the service provided. Thus, the authors wish that the material

generated in the in-depth interviews may serve as a baseline for the development of specific strategies to place greater emphasis on the application of this methodology in universities

The first conclusion of this work is that the value proposition of the methodology is very interesting, for all of the participants (students and community organizations). Furthermore, the research found that in most of the cases it was the first-time students actually had any contact with an NGO.

The second conclusion is that, in all cases, the work performed (marketing plan) has been very helpful to the community.

After examining the main advantages and disadvantages of the collaboration, the authors conclude that the main benefit for the communities surveyed is that, given the scarcity of resources of all of them, it would have never been possible to develop a marketing plan. For the students, the usefulness of the work done turns out to be the most valued aspect.

The lack of time and difficulty of communication are pointed out as the main obstacles. Bearing in mind the aforementioned limited resources, most organizations highlight the problem of implementing the student's analysis. In this sense, it might be interesting to provide greater continuity to the work done.

A further conclusion is that, through this methodology, students are able to develop a greater social commitment and improve their understanding of certain social problems. The student perceives an academic, social and personal development through the use of this methodology qualitatively superior to the rest of the experiences carried out in the university.

As a general conclusion, the experience of service-learning has been very useful for the communities, distinctive for the students and very positive for both parties.

In a future research, the authors will conduct quantitative research through surveys after the participation in the experience, allowing us to contrast the exploratory results mentioned in this paper.

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An Online Learning Diary as a means to develop writing and teaching competencies

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Abstract

This paper exposes the attempt to embed writing issues in the curriculum of the University of Applied Sciences (OTH), Regensburg, Germany, to increase academic literacy at the faculty of Electrical Engineering and Information Technology. It should show also how empirical self-reflection leads to better teaching. Target-group of the described format called "Online Lerntagebuch" (OLTB) were students from the 6th semester who visited the lecture "Secure System's Software Engineering". The first part of the paper explores the necessities of writing competencies in software engineering. The second part describes the theoretical ground, the third the specific format, the history and setting, and partly its evaluation. The OLTB answered in a slightly positive way the question of whether continuously provided writing assignments could increase writing, learning, and reflection competence or not. The results are positive. Moreover, the experiments and the evaluation provided help to adapt, change learning formats. Data reveal a need for changing methods. Concluding, two actual measures as direct results of the analysis will be mentioned.

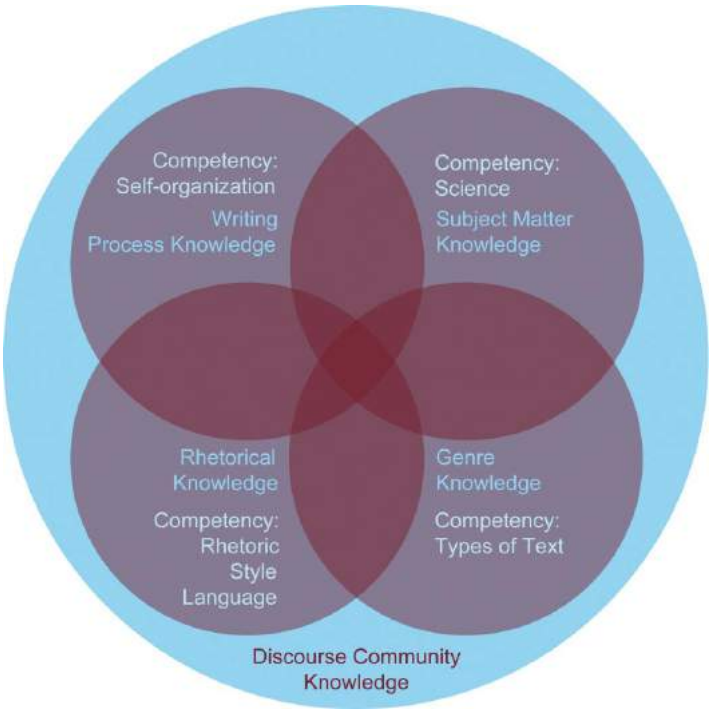
1. Introduction: Engineer's necessity to write

1.1. Why writing in Software Engineering and observing it?

Software engineering (SE) as science investigates, structures and evaluates procedures for the practice of all aspects of a quality-driven software development. This includes for instance analysis, design, implementation, and testing, also topics of ethic responsibility of all stakeholders taking part in these processes. Best learning methods in SE strengthen competencies beyond programming. The ratio of communication in SE is constantly increasing. Agile project management methods integrate customers as stakeholders at an early stage of product's lifecycle in a communication driven process, which lasts over the whole production period. Communication today is based on *written* words. This urges employees and students to write comprehensible and clear messages, correspondence, reports, comments, guidelines or specifications (cf. [1]). This means from a different angle: to recognize, understand, classify, evaluate, etc. many different text types or genres. High-quality communication requires acting in an interdisciplinary and competent manner. Figure 1 illustrates the different "domains". It is based upon [2] and [3] and extended with the competency domains of [4].

The realm of the discourse community knowledge encompasses four different knowledge domains which overlap. Only one of them, the subject matter knowledge, seems to be self-evident. Programmers are able to write software, and software engineers may be capable of sketching a system by using a modelling language. Naturally, students learn the matters of their subject. A software engineer should also be competent in all knowledge domains depicted in fig. 1.

Figure 1
Knowledge domains and their competencies



2. Basic principles and methods

2.1. WAC and WID

Writing Across the Curriculum (WAC) and Writing In the Discipline (WIC) are today's main principles for providing successful writing services at universities. Therefore, [5], pp. 23-24, paints a picture of WAC, valid for the whole university. She emphasizes the benefits for a cross-faculty application of the principle, which has lost none of its validity in 1984, but still today: "At its best, a writing across the curriculum program makes the university what it should be – a comprehensive environment of literacy and learning." WAC principles were developed around the 1970s as [6] describes (pp. 14-25). Best practice writing was seen and taught synonymous to correct orthography, grammar, and the fulfilment of text structure rules. Whereas WAC movement has tried to implant writing into the curriculum throughout the entire course of studies. Writing should be an instrument of learning. In the 1980s the WAC principle was extended by WID based on the recognition that every faculty is a domain at its own not only regarding the technical content but also specialized languages.

2.2. Writing to learn, learning to write

Besides the need to implement the WAC/WID principles in SE at the OTH, teaching and learning should follow also two other principles. Writing to learn (WTL) and learning to write (LTW). Active writing serves as a means to follow a structured path from thought to text to retention. WTL is defined by [6]: "Writing to Learn is based on the observation that

students' thought and understanding can grow and clarify through the process of writing." [6, p. 57] WTL comes with creating awareness for different text types and genres and often promotes journal writing. As a research project, we try to find the best ways to teach and to reflect our work. That is why we prefer an integrative approach that hybridises different aspects from the described principles.

3. The oltb-setting

The Online Learning Diary (OLTB-Online Lerntagebuch) was a research project which tried to find out via different methods and tools how writing (WTL and LTW) will have an impact on learning, writing skills, and the ability to assess oneself. The project also examined in which way teachers could increase their understanding of learning processes and how to adjust the methods to enhance their scholarship of teaching and learning.

3.1. The LaS³ and the EVELIN project at the OTH

The OLTB is part of measures developed within the larger framework, the EVELIN project [7]. Five universities of applied sciences from Bavaria take part. Scientists try to explore new experimental ways to improve the learning of Software Engineering. The Laboratory for Safe and Secure Systems (LaS³) at the OTH is one of the partners. Its staff members focus on different means to help students address obstacles and constraints in learning software engineering. In 2017, head of the LaS³, Jürgen Mottok, extended the focus on writing issues. The interdependency between writing (and reading) and the basic content of software engineering was recognized. Furthermore, the general situation at the OTH concerning the lack of writing assignments in software engineering raised the question, how to integrate them into the curriculum. In these two years of research on writing, a few approaches were taken to find out best practice methods and models.

3.2. The project's history

The efforts to investigate writing issues within the EVELIN framework went through three project stages: Starting with a typical writing workshop in summer semester 2017, consisting of regularly given lectures but without awareness for the special affordances and needs of engineering studies in general. The result was not satisfactory. The number of participants was low. Parallel to that, a first version of the online learning diary (Online Lerntagebuch, OLTB 1) was conducted by scientific employees. This event was directly connected to the lecture as a supplement. Week by week, writing assignments directly addressed topics from the lecture. The results of the voluntary OLTB 1 were encouraging. Participants consistently performed better in the exams. The team decided to go on with the OLTB although the personnel commitment was rather high. During the following winter semester 2017/2018, a different concept named c*lab was realised. [8] gives a detailed description.

3.3. The OLTB 2

The OLTB 2 (6th-semester students) was placed parallel to a lecture in software engineering of safe and secure systems (SES). Software engineering is as mentioned above

a science with an intense demand for writing skills (e. g. requirements engineering, design documents, software management, or ethics), therefore it is particularly suitable for writing experiments. The OLTB consisted of weekly given writing tasks following WID principle. Each session focused on the actual content of the lecture, (self) reflection, and writing skills. Three experts (computer scientist, pedagogue, writing professional) read the texts, corrected and commented them. Furthermore, a writing test was written under time pressure. An identical questionnaire, addressing self-assessment, at the beginning and at the end of the lecture accompanied the OLTB. During the semester cycle, each student took part in an interview centred around writing.

3.4. Research questions and thesis

Question: Does a set of continuously provided writing assignments —parallel to a lecture accompanied by deepening lessons— about software engineering increase the writing, learning, and reflection competencies of software engineering students?

Thesis: Regular writing assignments improve the self-assessment of students regarding their writing competence. Regular writing assignments improve the self-assessment of the students regarding their professional competence in software engineering. Regular writing assignments improve the competence of self-reflection.

3.5. Prerequisites

The Assignments (continuous text, bullet points were not permitted) were not accompanied by a writing-specific course. Each assignment could gain 100 points maximum. A task was considered passed if more than 50 points were achieved. In addition, one voucher for personal feedback from the writing professional was obligatory. If the OLTB was passed, participants received a twenty percent bonus for the exam. The exam had to be passed without the bonus. Those who completed at least nine of ten assignments with more than 50 points and redeemed the voucher received a bonus. Plagiarism was awarded zero points.

The quality (length, narration) of the texts were dependent on the technical focus. For example, the first session dealt with software malfunction caused by construction and programming errors and human failure. The human malpractice should be described, and regarding the software life cycle stages should be identified and described, which stages were ignored. Furthermore, alternative behaviour should have been suggested. This was pure text work, and most of the students wrote a remarkable amount of words. More technical tasks led to less written text. Weekly written reports by the staff should help to identify problems of the students, to display given feedback, to record learning obstacles, and to reflect conceptual or practical problems of the staff.

The interviews followed a qualitative method. The interviewer asked open questions. The interviewed persons answered deliberately. Each session followed roughly a set of pre-defined questions (e. g.: How much time did you invest at the beginning and how much after five sessions?).

3.6. Evaluation criteria

A total of 100 points were awarded per weekly OLTB.

— Quality of the text (50 points in total):

- Structure of the text (10 points),
- Train of thought (10 points),
- Expression (10 points),
- Language correctness (20 points).

— Technical content (30 points).
— Self-reflective part, quality of the answers (20 points).

3.7. Artefacts

The following artefacts were produced:

— Weekly written texts about the lecture's content.
— Writing assignment under time pressure, 90 minutes.
— Texts as part of the exam at the end (ethics of software engineers).
— Interviews (qualitative).
— Two LiKOM-questionnaires (Likert-scale).
— Weekly reports of the scientific employees.

3.8. Data collecting

3.8.1. *Text-based data*

Four members of the EVELIN staff worked with the 13 texts per week. The writing professional had a time expenditure of eight hours (rounded). The technical content was read by a tutor and a computer scientist. This process took 14 to 20 hours per week. The supervising of the tutor took an hour a week. It took two hours a week to edit the self-reflective parts. Data collecting started by evaluating and calculating the points achieved. Weeks afterwards, iterative reading of all written matter by counting the mistakes has processed. The following categories were applied: general (basic level) misspellings, general (basic level) punctuation mistakes, capitalisation/uncapitalisation mistakes, wrong case/mood/tense/number, wrong noun marker/genus, missing clause (e. g. verbs)/too many clauses (e. g. auxiliary verbs).

3.8.2. *Qualitative interviews*

The interviews were held mainly outside on the campus. The situation was in between a public and private atmosphere. The interviewer started with questions concerning well-being. It was intended to create a collegial atmosphere. Psychological aspects such as gestures and mimics were not recorded. The use of a recording device was dispensed with. The questions focused on a comparison between the first and later assignments ("Describe the difference at the beginning and now"). The answers were written by hand. Emphasis was not registered by a special spelling. The interviews lasted an average of 20 minutes.

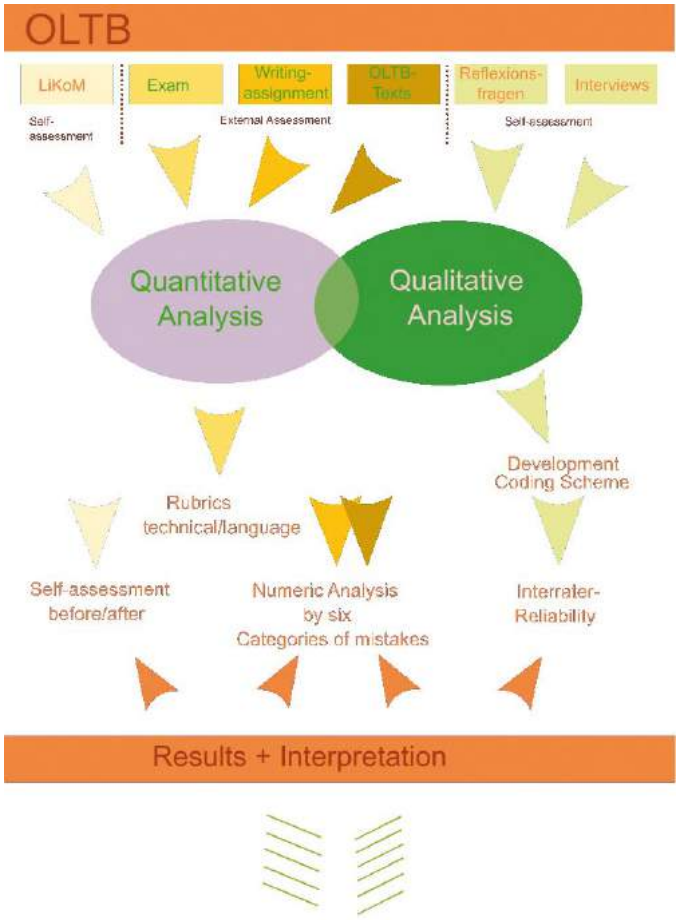
3.8.3. *LiKoM questionnaire*

The LiKoM (Likert-scale) questionnaire is an evaluated instrument for determining literal competence. It is a component and tool of the research project of the same name at the University of Bielefeld (duration: 2008 to 2011, cf. [4]). The questionnaire mainly focusses on the self-assessment of students regarding writing. In the applied version it includes 31 items. He not only asks about the relationship of the individual to his own writing at the level but also demands to generalize judgments and addresses practical levels of text production. In addition, problems are brought into focus e. g. knowledge management.

4. Evaluation

The resulting artefacts have been analysed using mixed methods of qualitative and quantitative research methods (cf. fig. 2). Still, in the process of evaluation, the OLTB has slightly approved parts of the core thesis. Just to sum up, the rate of mistake decreases and a significant increase in consciousness was observed. We will take a closer look at the achieved points, the number of written words, and the language errors. Furthermore, a random look at the interviews will be given. One question from the LiKoM-questionnaire will be regarded.

Figure 2
Ideal structure of the OLTB evaluation



4.1. Achieved points

Fig. 3 shows that writing competences started scarcely beyond 30 points and increased not dramatically but steadily. Fig. 4 displays the mean values of technical content. Here we see a significant decline in the figures for the eighth session. This was one of the most complex and difficult tasks, dealing with diagrams of the Unified Modeling Language (UML). The report notes many misunderstandings of the basic concepts. Fig. 5 on the right side shows the self-reflective part. Values are distributed in the range between 15 and a maximum of 20 points.

Figure 3
Mean points all participants (writing, 50 points max.)

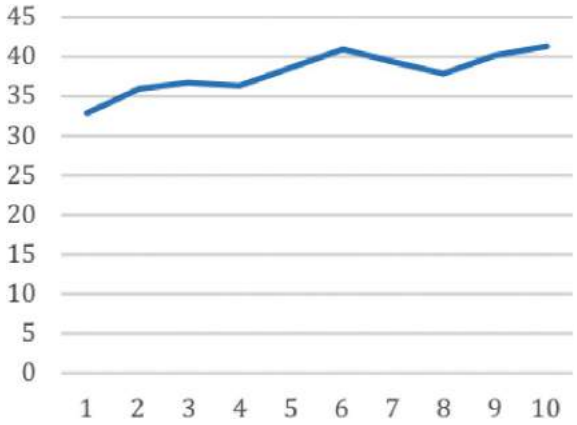


Figure 4
Mean points all participants
(technical content, 30 points max.)

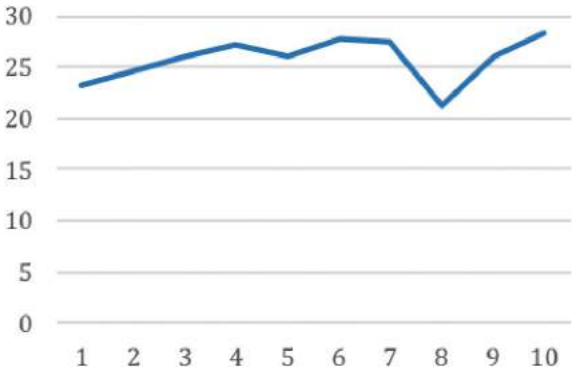
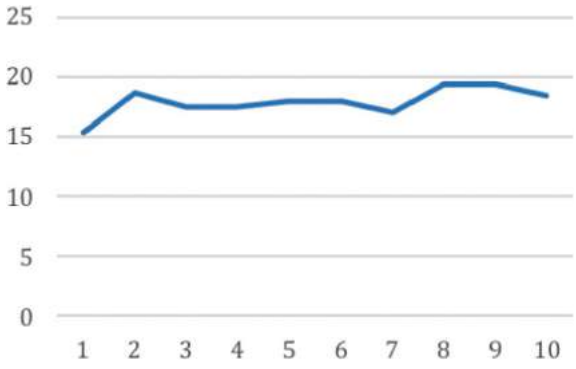


Figure 5
Mean points all participants
(self-reflective answers, 20 points max.)



It could be reasonable to look at the scatter of points in all three categories to get a picture of how the staff rated. This can be seen in fig. 6 to 8. The technical content shows the broadest scatter. The best rating can be seen in the self-reflection, the worst in writing.

Figure 6
Scatterplot technical content

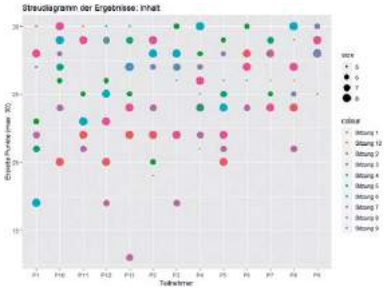


Figure 7
Scatterplot self-reflection

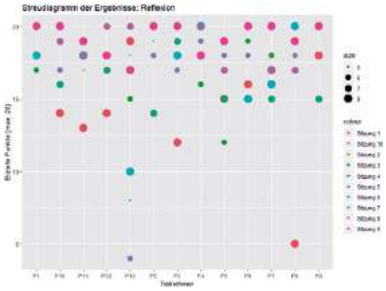
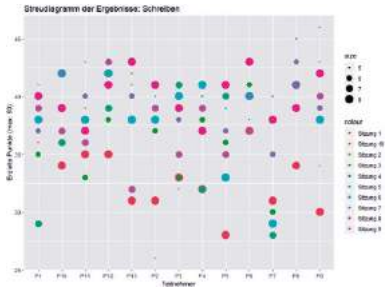


Figure 8
Scatterplot writing



However, this does not mean that students were better at self-reflection than in other areas. It could also show a difference in the staff's judgment. This needs attention from a SoTL-perspective.

4.2. Written words

The total of written words was 75.145. This corresponds to approximately 107 standard pages. The average number of words per task was 601 (median 569). The longest text consists of 1224 words, the shortest of 210. The writing exercise (under time pressure) shows an average word count of 302 (median: 274). The longest text consists of 488 words, the shortest of 122. In contrast, the comma error comparison per OLTB: min. 0, max. 28, mean 8,48 (median 7). The following four scatterplots look at how the number of written words correlate with the specific technical topic of a session. Fig. 9 overviews all sessions. The scatter is relatively homogenous.

Figure 9
Scatterplot of written words
(P = Participants)

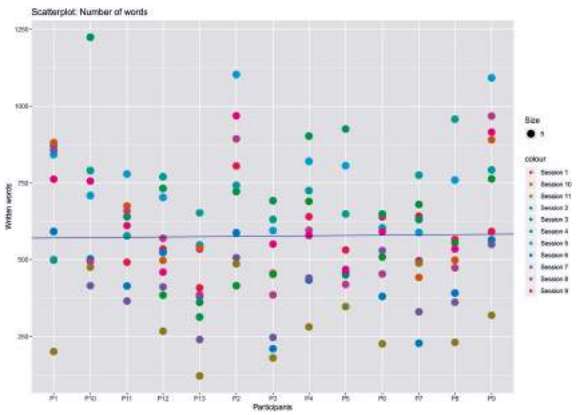


Figure 10
Scatterplot of written words session 1 compared with session 10
(P = Participants)

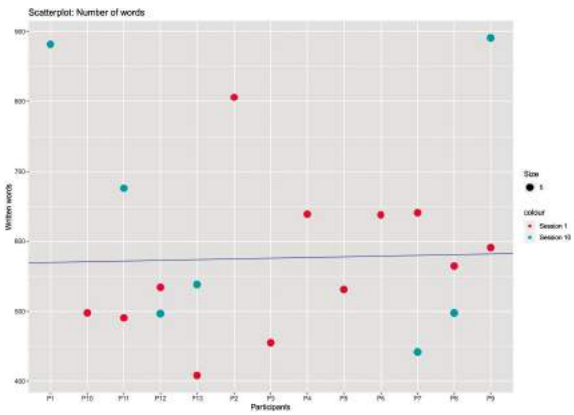


Fig. 10 compares session 1 with 10. Statistical outliers show there is no evidence that at the end of the semester the number of written words decreases due to proximity to the learning phase for the exams.

4.3. Language errors

Fig. 11 and 12 show the development of language errors during the semester (incl. the time pressure exercise) in mistakes per 100 written words. 11 is the exercise under time pressure. The number of errors decreased. From the highest starting point (session 2, 3.6 errors) the value has fallen to 1.6 errors (session 6) and ended at 2.8 (session 10). Writing correctly under time pressure seems not to be a problem for the students (2.2 errors). The amount of written words in session 6 is not significantly different do other sessions (min. 210 median 380, mean 433, max. 591). At this point, it can already be stated that the thesis is partly confirmed.

Figure 11
Language errors per 100 written words (mean value)

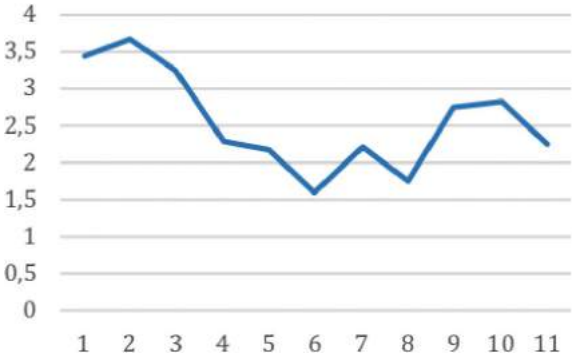
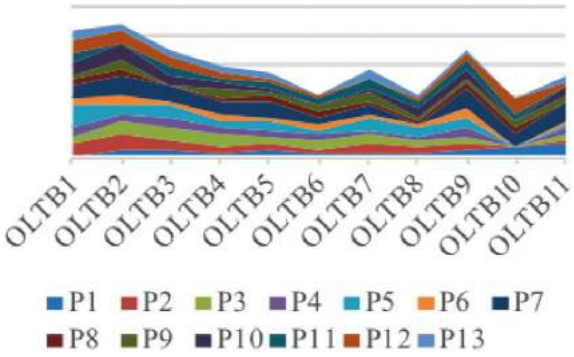


Figure 12
Cumulative mistakes per 100 written words (P = Participant)



4.4. Interviews

The following codes were determined: writing occasions, familiarization phase, time expenditure, obstacles, other. Just to name the most important one (100 %): Each participant registered a significantly lower expenditure of time the more frequently they wrote. P7: "In the beginning, I needed three to four hours per OLTB for writing and content work. Meanwhile, I can do it in two and a half hours."

4.5. LiKoM-questionnaire

Question 1.1 ("I enjoy writing") serves as an example. The analysis of data shows a mean value of 2.46 with a standard deviation of 1.127 at the beginning of the semester. The mean marks nearly the middle between "disagree" and "neutral". At the end of the semester, the numbers shifted a bit in the direction of neutral: mean value 2.54, standard deviation 0.877. The question itself provokes a bit. It could have been expected that the answers will not change.

5. Conclusion

The OLTB has revealed circumstantial evidence that a multifaceted perspective on teaching helps to find out the quality of teaching. In this case, it is very important to have in mind that a special course may have been more successful. The team then decided to change direction: Two new formats derived from our experiences: a. the CHEATfolio (winter semester 2018) and b. an accompanying course focussing scientific paper writing (summer semester 2019). The CHEATfolio tried to open paths to portfolio auditing. To write wiki entries was the goal. Students could then make use of their own research in the exam. The results were rather disappointing. The quality assessment revealed a lack of direct supervising. We rejected this format and look forward to the results of b. which prepares students from the 6th semester directly for the BA, teaching how to write a scientific paper.

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Re-thinking Problem-oriented Project Learning and the Challenge of Global Learning

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Abstract

Problem-oriented Learning (PPL) developed at Roskilde University (RUC) in Denmark faces challenges in responding effectively to diversity in the student population, including increasing numbers of international students from outside Europe. RUC has responded strategically by introducing a new pedagogic principle of 'international insight and vision' encouraging all educational programmes to integrate international, intercultural and global perspectives. This paper theorises how this principle can work with the whole pedagogic model at RUC to rearticulate PPL as a powerful form of global learning. In particular, the paper discusses how the principles of exemplarity (the way students' interest in their projects can articulate with broader social or knowledge problems) and problem-orientation (how the project problem defines the nature of interdisciplinary inquiry) can be viewed as cornerstones for re-thinking PPL and global learning. This concern is situated in a growing xenophobic and racist politics of belonging animating political life and policy across Europe. It is argued that re-articulating PPL through the concept of global learning enhances the original radical potential of the pedagogic model and offer an alternative educational vision to nationalist and xenophobic constructions of higher education as a public good.

1. Introduction

Although this paper deals with institutional and pedagogic responses to perceptions of increasing diversity in Danish universities, including that of international students, my argument is that these responses are caught up in a wider politics of belonging that is animating political life and policy development across Europe. The way diversity is constructed as an issue or problem in universities, and the way diversity is constructed as a problem for university teaching related to specific, often racialised, groups of students, has to be understood in this wider context. In particular, contemporary discussions of diversity have been associated with the rise in migration to Europe since 2015. This has been consistently characterised as a 'crisis'.

This 'crisis' provoked a number of responses from the EU in relation to the European Higher Education Area (EHEA). The Yerevan Communiqué made a call for an inclusive response to migration to be emphasised in the context of the Bologna and Lisbon processes, and specifically the development of inclusive environments in institutions of higher education. As well as advancing inclusion through employability, the Communiqué stresses the need to enhance the quality of teaching and learning in higher education and the building of more inclusive higher education systems. This was further enhanced in 2017 in the renewed EU agenda for higher education including the need to build environments within higher education for a diversity of students to succeed, linking the modernisation of higher education to the existential threat to the 'European project' posed by Brexit and the rise of nationalist and xenophobic political movements in Europe.

As part of the European HE modernization agenda there has been government encouragement for Danish universities to improve their position in global university

rankings[1], an increase in the number of international students entering Danish universities and university colleges, and an increase in international programmes where the language of instruction is English[2] . There has also emerged a politics of HE which has, instead, emphasised a nationalist sentiment. The Minister for Education has argued that Denmark needs to restrict the number of non-EU/EEA students accessing higher education[3], reducing the number of international students entering the university colleges and academies by 25% in 2017 and has plans for doing similar in the universities. He has also called for a reduction in the number of international programmes teaching through English. Diversity in higher education has therefore become almost synonymous with internationalisation.

It is interesting then, that one strategic response to diversity within higher education by Roskilde University (RUC) is the introduction of the 7th PPL Principle of 'International Insight and Vision' that picks up the international perspective outlined in the 2013 Danish government strategy that called for the creation of 'international learning environments' to replicate the kinds of intercultural experience and outlook presumed by student mobility. This new pedagogic principle at RUC requires all programmes to incorporate an international orientation. This sits at odds with the direction that government rhetoric and policy is moving. Also, how this is translated pedagogically is still uncertain.

This paper theorises how this principle can work with the whole pedagogic model at RUC to rearticulate this model as a powerful form of global learning. In particular, the paper discusses how the pedagogic principles of exemplarity (the way students' interest in their projects can articulate with broader social or knowledge problems) and problem-orientation (how the project problem defines the nature of interdisciplinary inquiry) can be viewed as cornerstones for re-thinking RUCs pedagogic model (PPL) and global learning.

2. RUC/PPL – a social experiment in higher education

Roskilde University (RUC), in Denmark, was established in 1972 as a social experiment in higher education. Born out of the social and political movements of the late 1960s RUC aimed at developing a form of higher education that was oriented towards a critical social engagement with the world. Although RUC was established under a Conservative government it was influenced by demands from radical left students and academics for a different kind of pedagogy that challenged traditional hierarchies of knowledge and power in universities[4]. This found form in a pedagogic approach that is currently known as Problem-oriented Project Learning (PPL) and codified in its 7 Principles (https://ruc.dk/en/problemoriented-project-learning-pedagogical-model-roskilde-university)

1. Project-work.
2. Problem-orientation.
3. Interdisciplinarity.
4. Participant direction.
5. Exemplarity.
6. Group-work.
7. International insight and vision.

In a common bachelor programme, a student will begin each semester needing to form a project group with a number of other students around a common inquiry problem. They will negotiate the specific nature of this problem with a supervisor and devise a research strategy that includes relevant theories and methodologies, drawing on a range of related disciplinary

fields. Over the semester, as well as supervision meetings, the project group will be required to present their work-in-progress in a number of evaluation events where other students and supervisors will have the opportunity to peer-review the project. The project group will then produce a project report (which could be a product, technical solution, etc. depending on the disciplinary fields and problem) and participate in an oral examination resembling a public PhD defence. Parallel to this process of inquiry runs courses on philosophy of science, methodology, and disciplinary subjects. This is repeated every semester with project group-work constituting 50% of the curriculum.

Underpinning these principles lies a composite pedagogy. Based on the theories of Danish educationalist Knud Illeris and pragmatist philosopher John Dewey, PPL foregrounds an experiential and problem-focused educational process. The educational process is understood as needing to transform the way a student understands the world and their relationship with the world. This is the model's radical potential. The starting point is seen to be the student's interests and therefore their prior experience of the world. But the educational process needs to transform that experience, expanding the student's knowledge and affective dispositions (problem-orientation). The ultimate objective is for education to result in free and socially critical individuals. Although the problems that students work on need to be authentic to the students themselves, they also need to be transformative in the way they orient the student to the world. Problems need to be connected to larger social issues or knowledge problems (exemplarity). In its original articulation this drew on the work of the German sociologist Oskar Negt where exemplary learning could lead to radical action aimed at human liberation. Education is not just learning about the world but of changing one's action in the world. Related to this is the idea of students defining the problem-orientation in consultation with academic supervisors (participant directedness).

3. The politics of belonging, nationalisms, and higher education

The Danish government has instituted policies that seek to give differential access to civil, economic and social rights to migrants, including international students. We can view this as a form of politics of belonging[5] where higher education is conceived of as a public good whose benefits should be preserved for the 'national' population. This is complicated due to the different scales of governance regulating migration. While the Danish policy on access to higher education may seek to differentiate between those who are 'of' and those who are 'in' (but not of the state)[6], membership of the EU means that Denmark has to meet obligations for the movement of students within the EHEA. While the Danish policy of access to HE is articulated through a nationalist sentiment, it emerges in a wider politics of belonging. Brubaker has noted how Europe has witnessed the rise of a civilizational politics of belonging[7]. The education minister's pronouncements occur in a context of an aggressive anti-migrant and anti-Islam discourse and policy regime. Higher education as a public good, similar to housing and welfare, is articulated as a component of Danish liberalism and democracy. This is not a right-wing agenda of emptying out the welfare state. Instead, the welfare state is constructed as requiring defence from a perceived encroaching illiberalism associated with Islam in particular. Liberal democracy, civil rights, and welfare states are increasingly articulated within a civilizational frame, of a secular notion of a Christian Europe. In Denmark this has seen governments officially label living areas with high concentrations of immigrants, often Muslims, 'ghettos', introduce proposals for forced assimilation of immigrant children, and banning of the burqa and niqab in public. However, such conditional access to welfare and civil rights for migrants has a long history in Denmark, with restrictive immigration and family reunion policies as well as differential

access to welfare dating back to the 1970s[8]. Such 'welfare chauvinism' seeks to maintain universal welfare rights only for Danes.

4. Re-articulating critical education

Faced with higher education policy being partially constituted by a civilizational politics of belonging, it might be hoped that university internationalisation policies would provide an alternative focus for both resisting such politics and advocating a different societal vision. However, institutional internationalisation policies are often driven by a number of instrumental concerns. Universities are asked to produce graduates who can contribute to and participate in competitive globalised economies. Internationalisation therefore is concerned with cultivating certain kinds of global knowledge and intercultural competencies. In Europe policies are also entwined in the EU commitment to the mobility of knowledge, students and academics, and the convergence of higher education governance. At a global scale this is further articulated with research competitiveness mediated by university league tables and journal impact factors, driving institutions to attract high-performing scholars and students to improve their marginal position in various rankings. Attracting 'international' students has been a significant activity engaged in by European universities. The limited guidance in Denmark has, until recently, sought to open Danish higher education to student mobility and attracting international students. Whilst this is now being restricted universities are still being called upon to be internationally competitive in terms of research.

The branding of universities as international or global takes little account of the way that universities and the knowledge they produce were complicit in historical processes of colonisation, expropriation of land, slavery, exploitation, and resource appropriation. RUC's Principle 7 repeats an often-accepted definition of internationalization[9]. Recognising that most students will not be mobile, internationalisation has been further enhanced by developing the intercultural and international home campus and curriculum. Sometimes this includes internationalisation of the university curriculum, including the use of non-Western case studies, authors, or epistemologies. However, this is usually depoliticized and neither challenges the dominance of Northern epistemologies nor the geopolitical production of universal knowledge. Without further explication RUC's Principle 7 may reproduce the dominance of Northern epistemologies and global hierarchies of higher education and fail to promote an ecology of knowledges[10] whereby different knowledge traditions and perspectives can be worked with to produce better understandings of and responses to the existential threats we face, such as climate change, food and water insecurity, global violence, and racism/xenophobia.

Global learning attempts to go beyond some of the limitations of the internationalisation agenda by advocating for an education that deals directly with the existential issues we face and of the relations of responsibility and solidarity that students should develop. In its more radical forms this presents global justice and equity as an organising frame[11] or the cultivation of critical global mindedness[12]. This involves an ethical and political commitment to the world and to others in the world, a willingness to interrogate the geopolitical foundations of knowledge and knowledge production, and an incentive to act in the world based on these commitments.

My argument is that this global orientation can both articulate with the pedagogical principles of exemplarity and problem orientation and re-articulate them as powerful forms of transformative education. For the purpose of this paper I will combine these two pedagogic principles in the process of problem-formulation where students are required to

construct a problem-oriented project but also develop it as an exemplary problem. Also, I will utilise the concept of global learning to incorporate the critique of northern epistemological dominance offered by de Sousa Santos' concept of ecologies of knowledge. This will represent more closely the practical process students would be involved in when formulating an inquiry problem in a RUC educational programme. If problem-formulation, in light of Principle 7, was guided by the concept of global learning as I have framed it here, students would need to consider their projects in relation to a number of organising questions

1. how do students relate their initial subjective inquiry interests to global existential concerns?
2. how do the members of the project group transform reflections (#1 above) on their initial subjective interests into a group interest?
3. how is that group inquiry interest related to global existential concerns, reflecting on whether their problem definition privileges the interest of the Global North at the expense of the Global South?
4. when considering epistemologies and methodologies do these reproduce the dominance of Northern epistemologies or do they enter into a critical dialogue with alternative epistemologies from both within the Global North and Global South?
5. do they orient their projects in relation to and in solidarity with social movements for justice and sustainability, and what are the consequences of orienting their projects in this way?

There are educational programmes at RUC that do engage, in different ways, with these organizing questions. Some programmes are putting the UN's Sustainable Development Goals at the centre of their educational work, asking students to orient their projects in relation to these goals and working dialogically with local communities and social movements, while other programmes work critically with Southern epistemologies. However, this way of conceptualising problem formulation is not consistent across the institution and is not embedded as a normative approach across educational programmes. Although these questions are posed in relation to the project-work component of the curriculum, these questions are relevant to organising the parallel courses. Do methodological or philosophy of science courses raise critiques of Northern epistemologies and open up the potential for engagement with other epistemological outlooks and modes of inquiry both with the Global North and Global South? Is there explicit engagement with the existential issues facing us and therefore which knowledges and methodologies are best suited to help address them without reinforcing existing global hierarchies?

5. Conclusion

RUC's pedagogic model of PPL, and especially its principles of exemplarity and problem-orientation have offered a potentially radical option in higher education. The addition of a seventh principle, that of international insight and vision, can enhance the radical possibilities of PPL. This appears even more important in the shadow of a growing xenophobic and racist politics of belonging that frames public goods such as higher education in terms of a civilizational politics. But I have suggested that the potential of this new principle of internationalisation is best served by articulating it through the concept of global learning as I have outlined it here. I have outlined a series of organising questions that would orient students' problem-formulation towards a more critical engagement with the existential issues facing us and the geopolitical production of global knowledge. This is

advanced as an alternative to reproducing existing hierarchies of knowledge and inquiry-problems. This way of formulating the new principle of internationalism offers a way of translating it into pedagogical actions that enhance the radical potential of PPL. However, this also has application to all forms of problem-based, inquiry-based, or research enhanced education by asking whose interests are served by the problems that student inquire into and what knowledge is deployed and produced.

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Empowering Social Work Students and Communities through Community-Based Group Research Projects: Co-constructingKnowledge and Building Capacity

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Abstract

The imperative to address societal and community challenges increasingly underpins Higher Education and social work education strategies. This paper showcases how social work education offers fertile ground to develop community-based participatory *group* research in order to connect universities, academics and students with the communities surrounding them. Using an example of participatory research undertaken by social work students and a community organisation which sought to explore the social needs of young people in a suburb of Cork, Ireland, I illustrate how developing a 'community of learning' consisting of a group of students (three in this case), a community organisation and a social work educator, can result in impactful knowledge that can be put to effective use for social change. This paper demonstrates how experience-based learning in social work education, and the emancipatory and social justice values underpinning the profession, align with the community-based learning that 'engaged' research affords social work students. Collaborative engagement with community organisations fosters experiential learning for students, communities and for social work educators. Community-based learning is credited with advancing student skills, personal growth, confidence, and citizenship (Celio *et al.*, 2011). I will describe my methodological approach to teaching and learning which focuses on nurturing a reflective, discursive, formative, collective and collaborative learning space for student researchers. I correlate the social work principle of empowerment with Shulman's (2005) conceptualisation of Signature Pedagogies as an approach which transfers to novice researchers skills of how to think, perform and act with integrity. The paper celebrates the possibility of developing 'engaged' student social work research from individual projects into group-oriented, collaborative exercises in scholarly research activity. In this regard, it offers a methodological development in capacity-building for both social work students and community organisations, and shows how student research, undertaken collaboratively facilitates the use of knowledge for change (Boyer, 1990).

1. Introduction

This paper showcases a community-based group research project which explored the social needs of young people living in a suburb of Cork city, Ireland. This collaborative research was undertaken by three post-graduate social work students and myself from the School of Applied Social Studies from University College Cork (UCC) in partnership with a voluntary community organisation based in the specific suburb. This application celebrates how collaborative, group-oriented research can be transformative and empowering for communities, for students and for academia.

2. Policy Contexts: Community-Oriented Higher Education

Ishisaka *et al.* (2004, p.321) argue that 'a major challenge facing contemporary higher education is to enhance its relevance and connection to the pressing issues and problems

faced by local communities'. The imperative to address societal and community challenges increasingly underpins Higher Education strategies at local, national and European levels. My own university's (UCC) *Civic Engagement Plan 2017-2022* and the third goal of the university's *Strategic Plan 2017-2022* (p.22) pledges to 'create value for our community through an international outlook and informed and creative engagement on local and global issues'. These sentiments echo Ireland's *National Strategy for Higher Education to 2030* which encourages higher education institutions to 'teach civic responsibility and strengthen communities' (Hunt 2011, p.76), a sentiment reiterated in the *HEA Systems Performance Framework 2018-2020* (p.11). The European Commission (2017, p.7) commend 'civic universities' who cultivate community links placing local, regional and societal issues at the centre of curricular, research and pedagogical developments. When considered together, these policy documents provide a strong impetus for a community-orientation in higher education – one which connects the academy to 'real-world' experiences. These policies also serve to respond to Boyer's (1996) call on universities to engage in the scholarship of engagement and to '…become more vigorous partners in the search for answers to our most pressing social, civic, economic, and moral problems' (Ishisaka *et al.*, 2004, p.321).

3. Discipline Contexts – Social Work Practice and Education

I work in social work education, which is currently organised in Ireland through professionally-accredited academic programs. As an applied practice, the social work profession is tasked with the performance of social policies. While it is informed by sociological, psychological, legal, therapeutic, behavioural, criminological, critical and emancipatory theories, Orme and Preston-Shoot (2003) refer to the perception that social work is merely a set of problem-solving interventions which can be undertaken by most people. They maintain that this perception '…has contributed over time to the lack of recognition of both the profession and the academic discipline' (Orme and Preston-Shoot, 2003, p.539). Jordan (1988, p.1) stated that 'social work is a very practical activity', while Castle (2000, p.521) has commented that 'research is a peripheral activity for many practising social worker'. Social work has struggled with its research identity (Witkin, 1995), partly because its originates from philanthropy and charity traditions as much as from social science. Chakradhar (2018, p.430) has noted the fraught history of social work 'in battling the reluctance to acknowledge the place of research in knowledge-building within the profession on the one hand, and seeking professional validation from the outside on the other'. Schön (2000) has described the dilemmas for professional academics and front-line practitioners today when facing demands for evidence-based practice. The dilemma is one of 'rigor or relevance' (Schön, 2000, p.32). Institutional and societal demands for evidence-based service provision currently appear to rely on what Schön calls the 'high, hard ground' where problems are manageable through the use of clear research-based theory and techniques. This can be seen in current social work practice in Ireland with the proliferation of policies, procedures, guidelines and frameworks which are seen by government and employers as a means of standardising and regulating practice in order to eradicate risk(s). However, Schön (2000, p.33) has also described the 'swampy lowlands' where 'problems are messy and confusing and incapable of technical solution'. This resonates with many practitioners and students who recognise that engaging with service-users and working collaboratively to affect change is never clear-cut or neatly achieved.

Research is an integral part of the social work curriculum even though social work students and practitioners can perceive research as detached academia with little or no relevance to everyday practice. D'Cruz and Jones (2004) have highlighted the negative

attitude that prevails among social work students and practitioners towards social research. US-based literature (Bolin *et al.*, 2012; Harder, 2010; Kranke *et al.*, 2015; Macke and Tapp, 2012) indicates that social work students' reluctance, dread and anxiety about research is a dilemma for social work education internationally. As a social work educator, this is a dilemma I face in the classroom and when I visit students on work-based placements. While Everitt *et al.* (1992) describe the relationship between social work and social research as 'problematic', Marlow (2001) went as far as to call it a *phobia*. Chakradhar (2018) says:

> Given the vital status of research in the academic curriculum for professional social workers globally, it is disconcerting that the majority of students are drawn to the social work profession for helping people but do not necessarily see the need for ongoing research to offer quality service aligned with best practice. (p. 430)

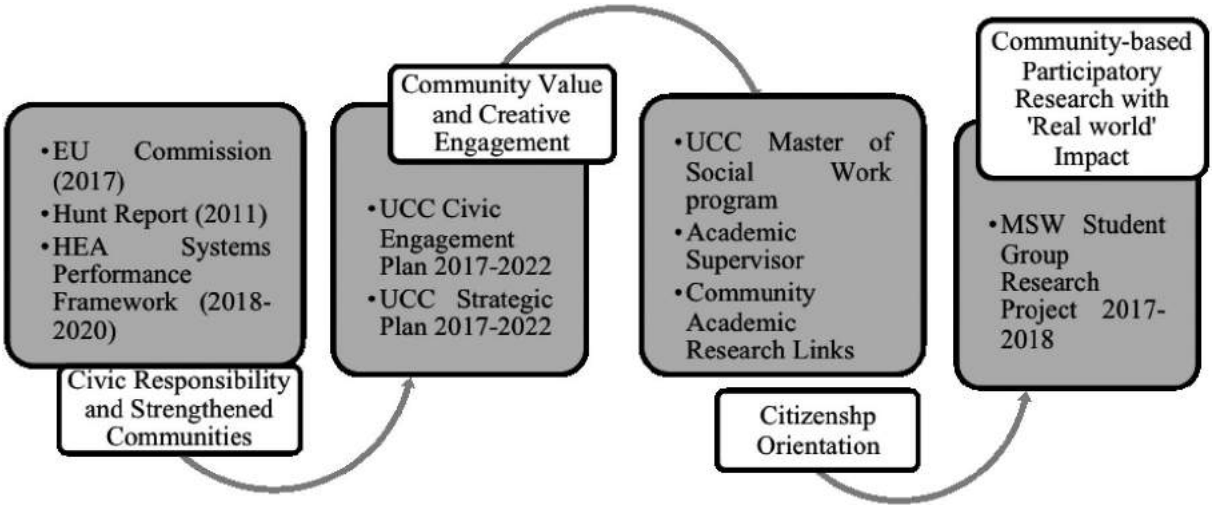
It is within this complex context of social work education that I embarked on a participatory research journey with three postgraduate social work students and a voluntary organisation. My pedagogical goal was to spark an interest and commitment towards research among this small group of students. Engaging them in a group, community-based participatory research provided a rich opportunity to enflame the burgeoning research interest among the three students, and was in keeping with the strategic goals of nurturing civic responsibility among students in higher education.

4. Bridging the divide: Community-based participatory research as a pedagogical tool for civic engagement

Schön (2000) argues that new forms of scholarship require a new epistemology within institutions, one that moves away from the norms of technical rationality towards a more reflective space where tacit knowledge, practice experience and wisdom, and action research are valued and promoted. This correlates with the demands for coordinated and integrated civic-engagement in higher education. As Ishisaka *et al.* (2004, p. 322) note, 'the call for increased community-university collaboration is compelling for social work education'. Engaging social work students in community-based participatory research provided a useful bridge between curricular demands in research education, policy demands for creating civic-minded graduates and professional demands in developing research-minded and research-engaged practitioners. Community-based participatory research (CBPR) "is a collaborative, change-orientated research that engages … community members in projects addressing community identified needs" (Puma *et al.*, 2009, p. 34). Fisher and Grettenberger (2015) argue that CBPR is an alternative orientation to research, which links science and activism. My conceptualisation of CBPR coheres with that of Jacobson and Rugeley (2007, p.22), who perceive it as 'social justice-oriented group work', which recognises community stakeholders as valued research partners, who participate in decision-making, 'problematize their social reality and build collective capacity to challenge that reality' (Jacobson and Rugeley, 2007, p. 22). This emancipatory research approach corresponds with core social work values and coheres with principles of social justice, human rights and anti-oppressive practice which underpin the two-year professionally-accredited Master of Social Work (MSW) programme in University College Cork, Ireland. The MSW combines academic study and fieldwork placements with research engagement. The overarching aim of the MSW is to develop committed, engaged, informed and skilled social workers ready for practice in the plethora of social service settings in Ireland and abroad. Academic staff on the MSW programme

are committed to sparking a citizenship orientation in students, where a priority is placed on teaching and learning methods that enable students to develop competencies to reflect on social issues and apply knowledge to facilitate change in civic contexts. The connections between macro-level higher education strategies, professional, institutional and program-level foci, and the values and principles underlying my pedagogical approach is represented in Fig. 1.

Figure 1



5. Methods

Following a review of the waiting list for the Irish Society for the Prevention of Cruelty to Children (ISPCC)'s Emotional and Behavioural Support Service for Youth in Cork city and county in 2014 and 2015, one specific suburb of Cork city was identified as the area 'most in need' (ISPCC, 2016). Emergent concerns for youth in this area included drug and alcohol use, bullying, mental health, peer pressure and social exclusion. Furthermore, issues such as poverty, anti-social behaviour and family dysfunction were identified as prevalent within the locality. Local stakeholders established a voluntary organisation in conjunction with the Community Association to tackle the presenting issues for young people in the area. With limited funding and resources, the organisation requested research via UCC's Community Academic Research Links (CARL) in order to gain further insight into the issues affecting young people in their area. I liaised with and acted as a 'match-maker' between three social work students and the community organisation. The three students, who were novice social work researchers, were drawn to the project because it was a grassroots community-based project. This alone demonstrates an appetite among social work students for opportunities to learn about, and to practice, research with 'real-world' impact. My teaching objectives were (a) to ignite an interest in the three students a commitment to doing and understanding primary research in partnership with each other and with a community organisation, (b) to provide an opportunity for the student researchers to enhance their group work skills, and (c) to immerse the students in emancipatory, participatory, practice-minded research imbued with social justice principles. From the outset, the pedagogical approach adopted in this project involved the community organisation as partners in designing, planning, organising

and implementing the research process. The overall research aims and objectives of the research project are charted below in Table 1.

Table 1
Research Aims

Research Aim	To identify the social needs of young people in the specific suburban area.
Research Objectives	To determine whether young people feel that they have adequate participation in the community; to explore the perspectives of adult stakeholders about the social issues faced by young people; and to access young people's perspectives.
Methods	Student 1: Qualitative Interviews with 6 key adult stakeholders Student 2: Survey questionnaire with transition year students (43 respondents) Student 3: Photo-voice with follow-up interviews with 7 young people
Time-scale	2017/2018 academic year (19th June 2017-19th April 2018.

In addition to the students, the research team also included the co-supervisors. I acted as the academic supervisor while one of the community group's volunteers, an experienced youth worker, acted as the community-based supervisor. As a community-based practitioner based, she brought an 'insider' knowledge to the research project. As co-supervisors, we focused on nurturing a reflective, discursive, formative, collective and collaborative learning space where learning, teaching and research could flourish. The active involvement of the youth worker in co-supervision reflects a democratisation of 'knowledge' where the community organisation involved in the research were seen as co-producers of the knowledge as well as bringing expertise through experience. The project became a 'community of learning' for the research team. The participatory process was equitable, producing mutually reinforcing partnerships between the community, the students and the university. Thus, the research project was a process-oriented experience as well as a goal-oriented project.

The research project incorporated quantitative surveys with school-going adolescents, qualitative interviews with adult stakeholders and ethnographic (photo-voice) research with young people from the area. Creative and innovative research methods were integral to this research project. Photo-voice was incorporated into the research strategy in combination with more traditional research methods (surveys and interviews). Photo-voice uses photographs to study participants' community environments; it '… is a form of community-based participatory research that engages participants at each step of the research process as documentarians, commentators, and agents of social and political change' (Bugos *et al.*, 2014, p. 1). Photo-voice presents an opportunity to give a voice to those who are often voiceless. In this project, seven young participants first took photographs of spaces and places in the community with one of the students subsequently carried out individual interviews to discuss the photographs. Table 2 provides a detailed time-line of the research journey from planning to implementation to dissemination.

Table 2
Project Time-line

Time-Frame	Actions
June-Aug. 2017	—Research Agreement signed by the Community Organisation, Academic Supervisor and Student Researchers.
Sept.-Dec. 2017	—Literature scoping review by students - for youth participation, community supports for young people, community social work and on international models of youth services. —Sampling strategy discussed and agreed with the Community Organisation. —Research instruments prepared (questionnaires, interview questions, photovoice protocols, participant information sheets, informed consent forms and informed assent forms for minors.
Feb.-May 2018	—Research project receives ethical approval from UCC's Social Research Ethics Committee (SREC). —Field work: February to March 2018. —Student submit their research dissertations as a part of their MSW program. —Formal presentation of research findings and recommendations by Students on 8th May 2018 at the MSW Research Conference in University College Cork.
June-Sept. 2018	—Research project is formally praised by External Examiner at the Summer Examination Board. —Research team meet with the Community Organisation to discuss the research findings and to discuss outputs. —The Community Organisation announce the establishment of a Youth Café in the area. —Research team prepare a group summary report for the Community Organisation.
Oct.-Dec. 2018	—The Community Organisation and the Research team and host a public event in the Community Hall to showcase the research findings to the local community, local and national politicians, and key stakeholders on 18th October 2018. —Students graduate from Master of Social Work Program 19th October 2018.
Jan.-June 2019	—The Research is shortlisted as a finalist for Best Research Project in the Irish National Education Awards 2019.

6. Results

The results of this pedagogical approach research are discussed below. Overall, the findings from this pedagogical approach to research education show the transformative, 'real-life' impact that can result from student research.

6.1. Outcomes for the Community

The mixed-method, participatory research produced rich findings for use in the community. The student research indicated that there was significant community fragmentation in the researched locality, devoid of youth participation. The absence of social cohesion resulted in a lack of community-based family supports. Both youth and adult participants reported concerns about alcohol use, drug use and mental health problems among the youth population in the researched area. Overall, there was a consensus that there

was an absence of public and community spaces where young people could congregate, socialise and feel included. This research demonstrates how a group of committed, civic-minded researchers can co-create useful, impactful knowledge even without funding. It exemplifies how a group community-based participatory research can facilitate the use of 'knowledge for change' (Boyer, 1990). The research has been described as 'transformative' by participants and the organisation. A number of key outputs within the community have stemmed from this research including:

1. A regular youth café has since been established in the community, providing a safer, inclusive space for young people in the area;
2. *The Community Organisation* and the Research team hosted a public event in the local Community Hall to showcase the research findings to the community, local and national politicians, and key stakeholders. This event has resulted in mobilising the community in their resolve to seek funding for a family support service located in the area.

The impact for the community organisation is reflected in a quote from the Community-based Co-Supervisor:

Being part of the research process was an edifying experience. The process in itself served as an intervention because the researchers' approach facilitated stakeholders' thinking about the subject. This gave momentum to the project and spurred action, links community and academia. Together, we engaged in a dialogue, connecting theory with practice which allowed those involved view issues through different prisms. This brought about learning for everyone at the table and eureka moments were had when the theory matched experience and vice versa.

6.2. Outcomes for students

The students were afforded the opportunity to engage in primary research, to grapple with research ethics, methodologies, sampling, data collection and analysis issues. They also engaged their core social work skills (evidence-gathering, assessment and analysis) and their practice skills (team work, planning and organising, interviewing/surveying, networking and liaising, digital literacy, report-writing and presentation skills). Social Work research dissertations are almost always individualised tasks where students take individual responsibility for their motivation, engagement and ethical conduct. This group research project challenged the students to enhance their research capabilities beyond the learning opportunities that individual projects offer. They developed their groupwork skills and their capacity to act collectively and in solidarity with experts through experience. This research how educating social work students about social research and engaging them in community-based research has enhanced students' professional proficiencies as well as their research prowess.

6.3. Outcomes for social work education

The complexity of contemporary living and life-experience for people means that there are every-increasing demands placed on the curricula of social work programmes by employers, accreditation bodies, user-groups, trade-unions and the academy itself. As a social work educator, I look to a *Signature Pedagogy of Social Work* to counter the demands to simply add more to the curriculum. Shulman (2005) asserts that in addition to knowledge-

acquisition, professionals must also 'come to understand in order to act, and they must act in order to serve' (Shulman, 2005, p.53). Becoming a social worker involves more than passive learning and didactic instruction:

> How are they educated in fields where knowing is not enough? You have to be able to do, to act, to perform. Even that's not enough, because in addition to knowing and performing you've got to become the kind of human being whom the rest of us can trust to perform with integrity, responsibility, honesty, and —dare I use an old-fashioned word— virtue? (Shulman, 2007, p. 13)

The values described by Shulman above correlate with the values of social work. My participation in this group research project suggests that teaching social work students research may not be a matter of adding more to the curriculum but more about re-orienting the curriculum towards research approaches which are unapologetically value-laden, aimed towards processes that align with social justice, empowerment, social change, indigenous knowledge and expertise through experience. I echo the sentiments of Fisher and Grettenberger (2015) who argue that the benefits of CPBR include:

> Greater relevance and usefulness of findings participation in the research process by all partners, enhanced capacity and trust among partners, better informed and more effective practice by the professional, and a process that encourages shared power and control over the research by all stakeholders. (p .570)

Jacobson and Rugeley (2007) assert that community-based group research 'provides an exceptionally good fit with the value base of the social work profession where integrity, valuing human relationships and self-determination are integral aspects of how social justice translates into practice' (p.35). I correlate the social work principle of empowerment with Shulman's (2005) conceptualisation of Signature Pedagogies as an approach which transfers to novice researchers, skills of how to think, perform and act with *integrity.*

7. Reflection and Conclusion

In a speech at the launch of the Irish Centre for Autism and Neurodevelopmental Research on 24th February 2012, the President of Ireland, Michael D. Higgins, stated:

> Universities are […] a part of our societies. What's the point unless the accumulated knowledge, insight and vision are put at the service of the community? With the privilege to pursue knowledge comes the civic responsibility to engage and put that knowledge to work in the service of humanity.

I challenge myself in my role as a social work educator to espouse professional social work values and skills. I aim '…to continue to model and sustain the values of engagement, reciprocity, mutual respect and regard that are at the heart of things like service-learning' (Shulman, 2007, p. 17). My own pedagogical approach in this research journey, utilised community-based group research as a means of igniting student interest in research, and in co-creating research that has 'real-world' impact. This research journey was also a pedagogical journey in relinquishing traditional perceptions of the research supervisory

role, which can place an emphasis on control, management and governance of student researchers. The research team took a collaborative approach to the project, equitably involving all partners in the research process and recognising the unique strengths that each member brought. In doing so, the research team have connected the university to community, students to activism, and communities to academic research. I was inspired by the spirit of cooperation which informed the research project and, while the students were engaged with exercises of scholarly activity, the participatory approach meant that this was a process of 'co-learning' for all involved. In this regard, it was an empowering process for the youth participants, adult stakeholders and the research team. Group community-based research projects therefore offer a methodological development in capacity-building for both social work students and community organisations, which can facilitate the use of knowledge for change (Boyer, 1990).

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Developing the professional 'toolkit' - Making learning meaningful in applied youth and community work education

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Abstract

Reflective practice is a signature pedagogy (Schulman) which is central to the education of professional youth and community work practitioners. Good reflective practice is based on the ability to connect the self to learning and experience. This requires learning frameworks that enable students to deconstruct learning and create meaning; we cannot learn from experience unless we have the tools to do so. As teachers in professional education contexts we need to assess how well we facilitate the conversion of knowledge into applied practice.

Providing the learner with tools that can heighten awareness of themselves as learners and provide them with a valid way to legitimise older and existing knowledge as well as the assimilation of new knowledge is the key task. The challenge is to create an environment that can enable the participant learner to 'join the dots' that exist between their experiences, concepts that construct meaning and the skills required to reapply the knowledge from these experiences to new and unique situations. While critical reflection can provide a learning lens to either allowing students to look back at a situation and understand it in a particular way or deconstruct a situation as it unfolds before us while engaging with it, the capacity to articulate that journey is central to the development route the student will take towards full capacity to integrate the personal, professional and theoretical in a practice environment.

Informed by key frameworks for facilitating the deconstruction of professional learning, this paper presents a reflective template designed to enhance the student's awareness of learning and to progress the knowledge from 'reflection on action' to 'reflection in action' (Schon). Using this tool, we argue that the internal conversation framework that we propose can create internal dissonance through engaging with critical analysis that provokes the learner to discuss, debate, validate and challenge their understanding of experiences and the meaning they have constructed around them. We consider this issue in the specific context of working with mature students undertaking a professional youth and community work undergraduate course in Ireland. However, we argue that our experience has broader value for professional education.

1. Introduction

This paper proposes key frameworks for facilitating the deconstruction of learning and challenges us to examine our own input into the process by asking ourselves whether we are constructing a process or imparting knowledge in a didactic way. To this end both adult learners and those practicing professionally within the humanities will be considered in the discussion as both the adult learner and the practitioner have an ongoing need for clarity that can adequately support the development of new knowledge. For this to happen the learner/practitioner must be exposed to a new set of values that is focused on accommodating learning in a safe environment where risk and experiment are encouraged and the individuals vulnerability while learning is not used to control or restrict. *"Self-directed learning depends on an element of risk"* (Light & Cox, 2001, p. 64).

Taking on this approach can allow the person to challenge their internal negative constructs that have been underpinned by more traditional methods of education. In order to fully appreciate and take full account of the situations and experiences deconstruction and dialogue need to take place. The connection of these two elements requires the construction of a reflective template. Quite simply we don't learn from experience unless we have the tools to do so. Without these the learner is unable to deconstruct their experience and re-construct it in a way that allows the development of meaning that contributes to the generation of new knowledge.

While critical reflection can provide a learning lens to either allow students to look back at a situation and understand it in a particular way or deconstruct a situation as it unfolds before us while engaging with it, the capacity to articulate that journey is central to the route the student will take towards full capacity to integrate the personal, professional and theoretical in a practice context. This is where both the internal and external voices of the learner/practitioner need to find their unified voice. The participant must be consciously aware of the learning from an opportunity, either post event or as it is taking place. Furthermore both the experience and the incident has to have some value for the person that can allow ownership. Understanding of how this meaning is constructed may be located in subjective and objective terms, but for the participant value can only be established after a meaningful connection is made with the persons existing body of knowledge. In the class room the challenge is to get the learner to locate, validate and value their experiences, getting them to make a connection with concepts and theory through the creation of deliberate learning experiences.

To this end providing the learner with tools that can heighten awareness of themselves as learners and provide them with a valid way to legitimise older and existing knowledge as well as the assimilation of new knowledge is key. The tools can be divided into a number of different areas such as 'discussion based approaches' (using 'reflective inquiry') in discussions with learners individually, through group supervision or discussion based classes. The challenge is to create an environment that can enable the participant learner to 'join the dots' that exist between their experiences, concepts that construct meaning and the skills required to reapply the knowledge from these experiences to new and unique situations. This paper considers a framework for this journey and looks at the learning stages of the students and the challenges and outcomes which are generated by each stage of the reflective journey.

2. Schon's Theory

Schon's theory of reflective practice focuses essentially on an openness to learning while not placing limits or forms of restrictive measurement and outcomes onto the creation of knowledge. Schon recognised that the starting point for the learner/practitioner is the familiar, validating present experiences by conscious interpretation or tacit knowledge used previously; *'When a practitioner makes sense of a situation he perceives to be unique, he sees it as something already present in his repertoire…it is, rather, to see the unfamiliar, unique situation as both similar to and different from the familiar one, without at first being able to say similar or different with respect to what. The familiar situation functions as a precedent for the unfamiliar one.' (Schon' 1983: 138*). This approach allows the learner/practitioner to recognise, deconstruct, value and in turn validate the actions in prior experiences. Through active reflection on the situation ownership can be taken around the situation and this in turn has legitimising properties for practice and prior learning, further enhancing and illuminating the construction of

meaning for the individual. Theory can be used like a lens either allowing to look back at a situation and understanding it in a particular way or deconstruct a situation as it unfolds before us while engaging with it. The internal conversation can create internal dissonance through engaging with critical analysis that accommodates the learner so they can discuss, debate, validate and challenge their understanding of experiences and the meaning they have constructed around them. By allowing the learner to recognise, deconstruct, value and in turn validate prior experiences we facilitate them to take ownership and engage in critiquing the self towards its effective use. Although Schon acknowledges the importance of a framework for inquiry this method of framing the generation of knowledge in no way impedes this exploration, rather encouraging the development of insight and awareness in an applied context.

3. The Student Group- B.Soc. Sc. (Youth & Community Work)

The B.Soc. Sc (Youth & Community Work programme in University College Cork focusses on the academic and professional development of mature students (over 23 years of age on registration), who have experience in the voluntary sector but who lack the relevant qualification to practice professionally. Quite often these students come from non-traditional educational routes and many have had interrupted experiences of education in their earlier lives. For the adult learner who is returning to education on a professional course there can be issues stemming from their own lack of confidence. The person may have been out of education for some time or an early school leaver. Where it comes to the issue of practice the returned learner /practitioner may have become over reliant on their own experiences using these alone to interpret situations which may lead to compartmentalising and isolating these experiences seeing them only as stand-alone events. In these instances the transfer of or adaptation of skills or methods used to new situation does not take place. *"Learning is not concerned with decoding and recalling information, but rather with the process of social and practical understanding"* (Light & Cox, 2001, p. 63). What underpins this underutilisation of tried skills and methods into new situations is both an avoidance of broader thinking and a lack of theoretical knowledge that will ultimately hinder or prejudice any attempt at engaging with conceptual frameworks. Not surprisingly many people react in a negative way when presented with a theoretical approach. It is not so much the theory but the sometimes emotional attachment to the event that presents a threat and prevents any type of critical analysis or reflective inquiry taking place. By not opening themselves up the learner/practitioner may run afoul of not recognising or owning their skills and confining their actions in events to a time or situations rather than understanding their potential for transferability. In the model of learning we propose in this paper the students work in a supported, person centred environment where they are encouraged to reflect, discuss and critically analyse their learning, insights and understanding with a focus on the development of the personal and professional self, underpinned and informed by theoretical thinking and concepts. The students work in an environment of enquiry, scaffolded across three years of staged learning and development. *"Assume students do their best work when given the freedom and space to use their own judgement"* (Light & Cox, 2001, p. 63).

Figure 1

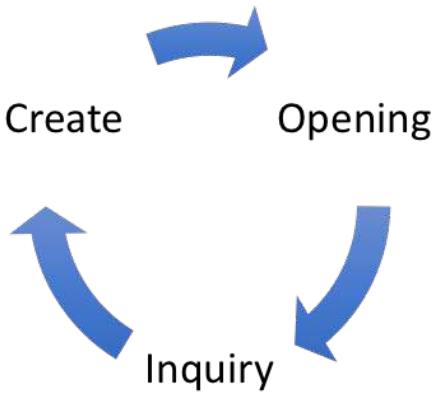
Beginner's Mind… "In the *beginner's mind* there are many possibilities, but in the expert's, there are few." ~ Shunryu SUZUKI

4. The Cycle of Informed Knowing

Over the three years of the course students engage in a three part cycle, starting in first year with the Opening of the 'Beginners Mind', then moving to deeper inquiry though internal dialoguing and in year three exploring and developing the skills to 'Create' new knowledge.

Figure 2

The cycle of informed knowing



5. Opening- Developing the Beginners Mind (First Year)

In the scholarship of teaching & learning we regularly focus on the how students make learning meaningful. The ability to make connections between learning and experience is key to the task of integrating learning into the world view and understanding of the individual. As teachers - how we encourage students to make these connections can have a critical influence on the outcome and ability to make those very links. This is particularly relevant for the application of theory to practice and the ability to integrate knowledge, skills and critical thinking into the practice environment, where quick thinking and proactive decision

making can play a vital role in good practice. For the learner re-entering education past experiences of mainstream school can negatively impact on the quality of their engagement. Many back to education students find moving on from these previous experiences of school difficult to say the least. Students often revert to taking on previously assumed roles of a 'passive, submissive, receptor of information'. This type of submission positions the learner in a place of disempowerment where they convince themselves that they know next to nothing while placing all trust in the expert or teacher. On the converse side teachers in some instances in mainstream education can be reliant on this type of submission or a submissive process in order for them to successfully engage with their role as an educator.

The focus of the BYCW degree course is to allow the learning to begin with the adult learner, acknowledging and valuing what they bring to the course and placing this centrally to the process of learning. In the class room the challenge is to get the learner to locate, validate and value their experiences, getting them to make a connection with concepts and theory through the creation of deliberate learning experiences. How then do we move that outside the classroom and enhance the student's ability to coalesce the learning into the capacity to make practice decisions in the field? How do we create a safe learning environment for students to experiment and develop their knowledge and skills in an applied setting?

For the individual learner developing the concept of the "Beginners Mind" is a central tenet of the course. It is proposed to the student that learning should be valued as a process or continuum rather than as a prior agreement on ends decided before starting the journey of learning. If the learner accepts this concept it should allow them to deal effectively with the discomfort of 'not knowing.' Far from being a disadvantage to the learner, 'not knowing' can be an opportunity for collaboration and growth. In short, the "Beginners mind" does not cloud or restrict learning, on the contrary it sees each situation as being unique unto itself thus offering the possibility of creating new knowledge. The concept of the Beginners Mind can also offer the learner autonomy over their learning while leaving them open to development of new knowledge.

Figure 3
Beginners Mind

For the student to effectively engage with learning on first year of the course it is proposed that they engage with the following actions, tools and processes…

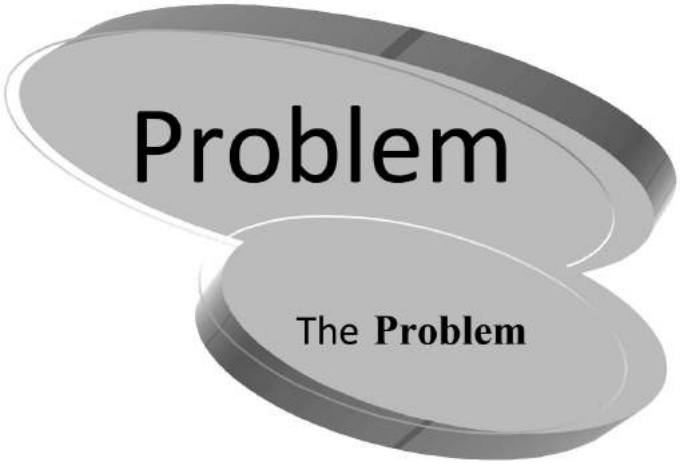
— Engaging with Critical Analysis.
— Journaling – Recording practice events – Portfolio of Learning.
— Understanding Theory in use and Espoused Theory.
— The Familiar – how use the known to access tacit knowledge.
— Develop an understanding around the uniqueness of the situation.
— Legitimisation – recognising skills and concepts are owned, learned and transferable.
— The process of deconstruction practice – What, why, who, when, where and how.
— Reflection – In action, On action, On analysis and for action, (Schon's concept of reflective practice).
— Tacit Knowledge – (knowing in action) 'I did it because it what I thought I should do'.
— Acknowledging the Intuitive practitioner – where experience is the unconscious informed guide in practice.
— Problem setting as opposed to problem solving.
— Initial engagement with the process of Group Reflective Inquiry.

6. Inquiry – Developing the Conversations (2nd Year)

Second year of the course encourages the student to explore the internal and external dynamics of engagement with practice, here reflective practice starts to take on a significant role in the formation of the professional. Schon's concept of Reflective Action is essentially a conversational template, the conversation with the self, with the situation and presenting elements. The active internal and external dialogue bases itself on existing knowledge and the creation of new knowledge through the construct of an inquiry. The Internal conversation can create internal dissonance through engaging with critical analysis that accommodates the learner so they can discuss, debate, validate and challenge their understanding of experiences and the meaning they have constructed around them. Similarly Schon legitimised 'thinking on your feet' as the basis of which is the internal dialogue, we are not going in with all the answers but rather we are testing the hypothesis. We are encouraging the approach of entering in to new situations with trust, knowing and the beginners mind, rather than pre-set notions and desired outcomes as these will only prevent engagement with the situation in any real way. Schon saw the internal reflective conversation was central to the effective application of theory; *"Using theory in practice involves a 'Reflective conversation with the situation'. This implies a phenomenological approach which emphasises the active interpretation of events. (Thompson, 1995, p. 76).* Schon also saw that understanding theory in practice was beyond mere application but a process of immersion and in some cases a revelation. Reflective practice requires the individual to be consciously aware of themselves in the situation open to the 'surprises' from the event. *'Schon has inverted this conventional understanding of the relationship between theory and practice (the simplistic idea that theory is applied deductively to practice), demonstrating that significant dimensions of 'theory' are only revealed through skilled practice, are often beyond conscious articulation'. (Gould, Taylor, 2005: 2).* Theory and the Internal Conversation play a central part in the process of re-framing in second year. This process allows the learner to deconstruct the situation and locate what might be the problem behind the problem, sometimes what we see as the problem is only something standing in the way of the real problem. When reframing the process allows the practitioner to view the context, dynamic and structures around the problem differently, reframing is the result of problem setting (understanding more than one answer for change).

'Reframing a problem can bring about changes, these changes are affirmed depending on the value of the change element, in short if you like the change or not.' (Schon, 1983, p135) The opportunity is also here for the practitioner to become more aware of their own interactions and the engaging in a new conversation with themselves in the context. *"A successful reframing leads to a continuation of the reflective conversation" (Schon, 1991, p136)*

Figure 4
The Problem behind the problem



The focus of the process in year two is to develop Learner/Practitioner so that they can engage with the following

- Engaging in more depth with Reflective Action, Critical awareness and the Internal Conversation.
- Recognising that situations are an opportunity to learn and create new knowledge.
- Develop more skills in the area of reflective inquiry both on an individual and group basis.
- Developing practitioners that understand the uniqueness of their practice and the situation.
- Group Work and Individual Case Studies.
- Developing understanding around the construction of theories and concepts.

7. Creativity – The Effective Use of Self and Knowing In Practice (3rd Year)

For the learner the effective use of self is a central to their engagement with situations, at this stage an informed awareness and consciousness in their practice is essential realisation. To this end providing the learner with tools over the course of three years that has heightened their awareness of themselves as learners, provided them with a valid way to legitimise older and existing knowledge as well as the assimilation of new knowledge is critical to the informed outcome in third year. Tools can be divided into a number of different areas such as 'discussion based approaches' i.e. using 'reflective inquiry' in discussions with learners individually, through group supervision or discussions based classes that

reflect on the value and meaning of learning. The challenge here is to create and maintain an environment that can enable the learner to continue to 'join the dots'. These points are those that exist between experience, concepts that construct meaning and the skills required to reapply knowledge from these events to new situations. Written based inquiry through the use Process Recordings and Case studies also help develop the learners articulate their 'internal conversation' as well as finding a new voice - one that can speak to them either during the action writing or the re-reading of past journals. For the learner/practitioner experience is a constant factor, learning from experience, becoming involved in an experience and experiencing others. However the ability to connect the self to learning and experience requires learning frameworks that can enable students to deconstruct learning and create meaning. The development of the toolkit over the preceding 2 years has been critical to the development to this point. The participant must be consciously aware of the learning from an opportunity, either after the event (Reflection on Action) or as it is taking place (Reflection in Action). Furthermore both the experience and the incident has to have some value for the person that can allow ownership. The understanding of how this meaning is constructed may be located in subjective and objective terms, but for the participant value can only be established after a meaningful connection is made with the persons existing body of knowledge.

The use of our past experiences within the context of an unfamiliar problem either consciously, when we can directly relate to a situation, or unconsciously when we feel a sense of familiarity from the situations dynamic, allows the practitioner access into the dynamic of the problem. For the practitioner an opportunity to 'know in action' presents itself by the examination of the contributions of the past and their adaptation to a new context. Although this idea may not seem in any way new Schon allows a new value to be placed on this process, it also offers a challenge to the practitioner on two levels, firstly to locate the experience within the past, that may or may not be familiar and secondly the adaptation of this experience to a new frame which will allow for new experimentation. '*It is our capacity to see unfamiliar situations as familiar ones, and to do in the former as we have done in the latter that enables us to bring our past experiences to bear on the unique case. It is our capacity to see- as and do - as that allows us to have a feel for problems that do not fit existing rules.*' (Schon, 1983: p. 140)

Over the three years of the degree course the interpretation of meaning moves from description to analysis and to knowledge creation. Without these elements the learner is unable to deconstruct their experience and re-constructs it in a way that allows the development of meaning and the generation of new knowledge. The construction of a reflective template enhances awareness of learning and the skills of the reflective practitioner.

The focus of the Year three process is to develop learner /Practitioners that can engage with the following…

— Practitioners who are Reflective and Critically Aware.
— Practitioners who see engagement with situations as an opportunity to learn and create new knowledge.
— Develop creative reflective practitioners.
— Individuals who can engage with reflective inquiry both on an individual and group basis.
— Developing practitioners that understand the uniqueness of their practice.
— Practice conversationalists – moving the practitioner to 'Knowing more they can say' to having both saying and knowing on an equal footing.

8. Conclusion

For the adult learner going into a university setting the process of engagement can be uplifting and intimidating. The learner may feel that they are an imposter in an environment surrounded by younger people who appear and just better. Rather than suppress these thoughts and feelings as a teaching team we have used these issues as a starting point to explore and reflect upon them with the students. The opportunity to examine these in first year, first term can be a validating process for the student and an opportunity to remind the adult learner about what they bring to the experience of university. Adopting a Person Centred approach and using it in a framework of Reflective Action is both a valuing and challenging process for the student. By reflecting on experience through the lens of the Personal, Professional and Theoretical, stronger and more substantial links can be made when identifying how new knowledge can be generated from situations. Tools used for inquiry such as Process recordings, Journaling, Reflective Inquiry (Individual/Group) and Problem Setting are tools that allow for the grounding of Reflective Action making it an active concept. Through engaging with these tools the learner is able to understand the uniqueness of their own approaches to learning while valuing their own knowledge but at the same time always prepared to say 'I don't know, but we can find out together'.

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Cultural encounters: enhancing students' learning from a stay abroad

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Abstract

Students at the Department of Human Geography & Spatial Planning at Utrecht University leave their classroom to learn abroad: they go on exchange for a semester in Malaga, embark upon a fieldtrip to Stockholm for 6 days, or do a 3-month fieldwork in Africa. Learning outside the own classroom is an essential element of the training of geographers. Well-developed intercultural competences are vital to reap the benefits of such stay abroad, and, later on, to work in an increasingly internationalized labor market. However, immersion in a different cultural setting does not itself assure intercultural learning: an active learning environment is needed to achieve this (Trede *et al.*, 2014; Brendel 2014). Thus far, for several reasons, the stay abroad was a rather isolated component in our students' educational programmes. Upon return, exchange students often point to the immense impact of the period abroad on their academic and personal development, but they can hardly articulate their advances in specific intercultural skills and attitudes. This is strongly related to the fact that upon departure, students do not know what to expect regarding intercultural differences in the field. Furthermore, they are not stimulated to reflect on their intercultural experiences during their stay abroad. As a consequence, the learning of fieldwork abroad is not optimized. Previous experiences and literature call for an approach that confronts students with their own expectations and world views, that stimulate reflection and provoke discussion. Against that background, we developed two projects to prepare students better for a stay abroad, and to train their intercultural competences, using a three-step approach: before, during and after the stay abroad. This paper first introduces the topic and the literature on enhancing the learning outcomes of a stay abroad. Then, we will introduce our projects, one dealing with Master's students that do their fieldwork in Africa, Asia or Latin America, a second one dealing with undergraduate students that go on exchange. Next, we will present our preliminary findings on the impact of these projects on students' learning. We conclude with the observation that reflection as a skill deserves more attention in our curricula.

1. Introduction

Students study abroad to complement, deepen or widen their educational programmes at home. This study abroad can take different forms: students participate in international field trips, they collect data in unfamiliar settings, and they take courses abroad, in new university settings. While being abroad, they are exposed to much more than academic knowledge or academic skills as they have encounters with other people in often quite different economic, political, social and cultural environments. This is the reason that alongside their academic learning, students abroad develop professional and personal skills that enhance their competences. Studies mention a long list of expected benefits including language skills, transferable skills, a greater awareness of global differences, the appreciation of diversity, the development of personal and interpersonal skills, career awareness and academic focus, and critical-thinking skills, including the ability to apply academic concepts to an understanding of real-world situations (Jackson & Nyoni 2012; Crossman & Clarke 2010; Gu *et al.*, 2010; Farrugia & Sanger 2017). Unfortunately, more often than not students are unaware of the development of these skills, as this is not clearly articulated, and hardly

reflected upon before, during, or after their stay abroad. A more structural observation is that the achievement of such benefits is not a natural process: the experience only, such as immersion in an international classroom or different cultural setting does not assure intercultural learning (Trede *et al.*, 2014; Brendel *et al.*, 2016; Huber and Reynolds 2014; Deardorff 2006; Lokkesmoe *et al.*, 2016). On the contrary, it requires guidance and in-depth reflection (Holmes & O'Neill 2012). These two teaching components are difficult to teach effectively when students are abroad. However, guidance and reflection might be manageable in an active learning environment specifically targeted at this student group. Several authors point towards the necessity of approaches that enhance these outcomes (Lokkesmoe *et al.*, 2016; Strange & Gibson 2017). Examples of such approaches are pre-departure intercultural learning modules that examine students' own and others identities (Holmes *et al.*, 2015) and the use of reflective diaries and learner journals (Dummer *et al.*, 2008). Many of these approaches see reflection as key to reap the benefits of a stay abroad. Reflection is a meaning-making process, about learning from experience, and developing one's own thoughts. Over the years, several models for reflection have been developed, such as Bain's model of the 5 R's (reporting, responding, relating, reasoning, reconstructing); Gibbs reflective cycle (1988), consisting of 6 stages of reflection; Johns' model of structured reflection (MSR) and the cycle of Driscoll (2000). These models have three main elements in common: i) a description of the event; (ii) the analysis of the event: what happened exactly?; and iii) the action, or the 'so what' question, the implication of the event for future actions. A model specifically elaborated for reflection on intercultural competences in an educational context is the PEER-model of Holmes & O'Neill (2010, 2012). This model consists of 4 interconnected and interrelated phases: Prepare-Engage-Evaluate-Reflect. To a certain extent the PEER-model also includes elements of Kolbs' Experiental Learning stages and Gibbs's Reflective Model, as it is also flexible and enables continuous use.

This contribution analyses the learning outcomes of two learning trajectories geared towards the development of intercultural and professional skills while abroad, using the PEER-model of Holmes & O'Neill. These trajectories were developed in the Department of Human Geography & Spatial Planning at Utrecht University. For geographers, learning outside the classroom is an essential component of their education. However, we noticed that students had difficulty to define the contribution of this learning outside the classroom to their academic and personal development and, in the longer run, their employability. Using a combination of qualitative and quantitative data collected before, during and after their stay abroad, we aim to evaluate the learning effects of the training trajectories offered. In this paper we focus on the role of reflection in learning from intercultural experiences. In the following, we describe the objectives of and the activities in the two trajectories, and the first results. We conclude with comparing the two cases.

2. Two Learning Trajectories to Enhance Learning From Stay Abroad

2.1. Learning from fieldwork in the Global South

Setting. The one-year Master's programme in International Development Studies (IDS) prepares students for a career in the field of international development. Half of the programme is dedicated to a three-month research fieldwork in Africa, Asia or Latin America. Thusfar, the development of soft skills is not adequately addressed in our curriculum: students do not know what to expect regarding intercultural differences in the field, and the learning of fieldwork is not optimized. Yearly, about 45 students leave for a field work in the global South.

Aim of the trajectory. Using the PEER-model of Holmes & O'Neill, we have developed a six-step learning trajectory that is integrated in the various stages of the fieldwork (preparation of fieldwork, actual fieldwork, writing of the thesis). The aim of this trajectory is to strengthen students' intercultural competences and their research skills. The six steps include lectures and workshops with assignments before departure, reflections assignments during their stay abroad, and structured discussion upon return.

Findings and evaluation of outcomes. We evaluated the learning trajectory with our students, asking them to answer some statements (Table 1).

Table 1
Students' assessment of contribution of the IDS Learning Trajectory to learn from intercultural experiences, cohort 2016-2017

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The lecture/workshops/assignments were suitable to learn to reflect on how the intercultural setting of the research and my positionality as a researcher may influence the process of data collection (N = 30)		3.3%	46.6%	46.6%	3.3%
Writing the interim report has helped me to identify practical problems I encountered (e.g. regarding health, time frame, infrastructure, safety, etc.) and their effects on the process of data collection (N = 30)		6.7%	30.0%	50.0%	13.3%
Writing the interim report has helped me to deal with these challenges (for example by adapting my research strategy) (N = 30)	10.0%	13.3%	40.0%	33.3%	3.3%
The reflection during the Return Day will help me to explain in the thesis the effects of the intercultural context of my research and my own positionality on the process of data collection (N = 29)		10.3%	31.0%	55.2%	3.4%
I enjoyed learning about intercultural research competences (N = 28)	3.6%	3.6%	10.7%	67.9%	14.3%

The overall opinion of the students on the contribution of the learning trajectory to their learning is positive. They in particular like to be introduced to the concepts of positionality and intercultural competences, linked to research. Some examples of comments that students jotted down include '*attention paid to how your own paradigm influences data collection, it is never neutral*', and '*discussing with other students helped to reflect on intercultural aspects I may not have considered otherwise*'. However, students value the contribution of frontal lecturing and reading texts on interculturality before their fieldwork as limited, as the concept remains rather abstract. Especially practical examples appeal to students' imagination.

Preparing a written reflection while in the field is considered less useful by the students, who indicate that '*writing an interim report takes up time one can better spend on data collection*'. An evaluation of the interim reports from the first year showed that at times students felt uneasy about describing the pitfalls in and challenges of their research. The reluctancy to reflect in an in-depth way may be caused by the feeling that their teachers might consider self-criticism as a 'failure', plus the fact that the assignment was graded.

More activating forms of learning, in particular the exchange of views and experiences immediately on return, were highly valued by the students. The discussions the small groups had were very lively and, being together, the students seemed to be able to address these questions in a more in-depth way than they did in the individual written reflections halfway through their research. Linked to this we observed the importance of the interaction with peers, and the role of peers as reference framework. Beforehand, all the students added to the methodology part of their research proposal expectations regarding the impact of their positionality in the field. Afterwards, the form of reflection on this positionality varied considerably: some just added a few lines about being aware of the limitations/challenges they will encounter, while others wrote a rather detailed account of their expectations. We observed that most students were not familiar with reflection skills, and simply did not know how to deal with reflection assignments.

In the end, the intercultural research competences of our students should be adequate to deal with the requirements of field research. Generally, supervisors note that the majority of the students is able to at least superficially evaluate —in the final thesis— their positionality in the field, and link this to data collection. A more integrative approach, in which reliability and validity of data are profoundly reflected upon and critically linked to outcomes of the research, is considered a much more complex exercise, and performed by only a selected group of students.

2.2. The XChange learning trajectory: enhancing employability skills via intercultural experiences

Setting. Approximately 80 students of the three undergraduate programmes in the Faculty of Geosciences go on exchange every year, mostly one semester. Students often mention that they could have been better prepared and benefitted more from their stay abroad, and that they do not take time for a critical reflection on their stay abroad. This hampers the recognition of academic and personal returns of their stay abroad, and of the meaning and the value of their international experience for their future career, often linked to so-called employability skills.

Aim of the trajectory. In order to increase the effects of intercultural experiences, in 2018 the Faculty of Geosciences and the Centre for Academic Teaching at Utrecht University developed the XChange project as an extracurricular learning trajectory for Geosciences undergraduate students involved in an exchange programme abroad[1]. The learning trajectory aims to increase the awareness and effectiveness of the contribution of intercultural experiences to employability skills of students. Upon completion, the trajectory renders all participants a certificate.

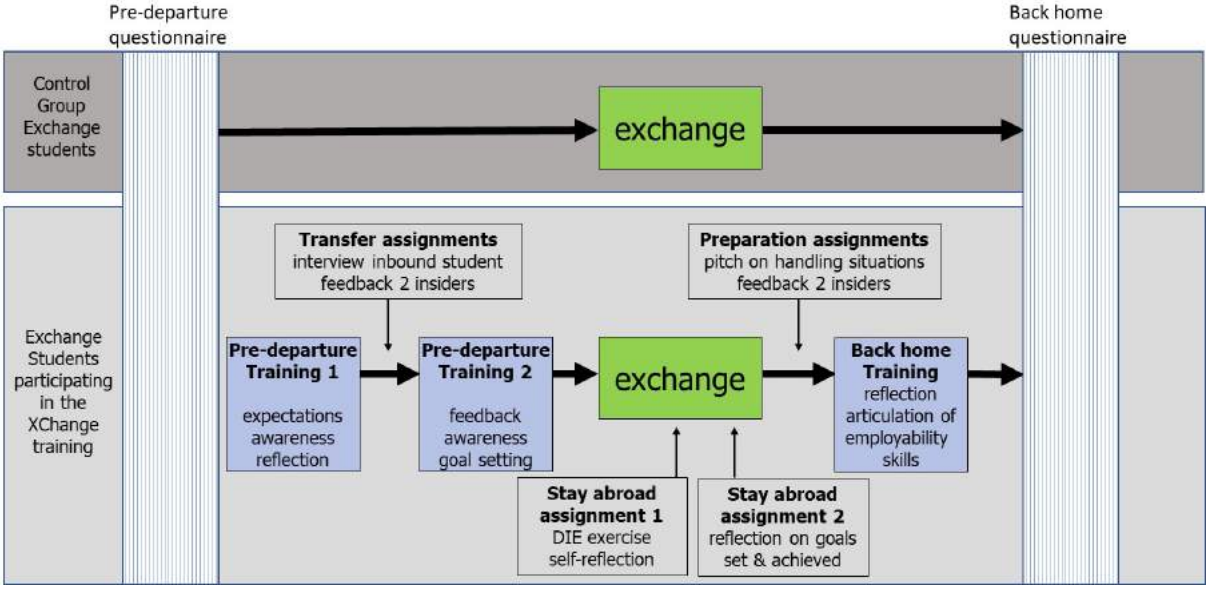
The XChange training is based on the PEER-model of Holmes & O'Neill in emphasising the Preparation, Engage and Reflection stages, while accounting for continuous reflection and feedback on reflection (Gibbs 1988) during the process. The XChange training consists of three parts, each explicitly emphasizing and practicing awareness, reflection and goal setting in the realm of intercultural experiences abroad: 1) pre-departure meetings, with two 'transfer' assignments in between; 2) stay abroad assignments; and 3) a back home meeting, with preparation assignments[2].

[1] Ethical Approval is applied for at Utrecht University (April 2019), as the measurement of learning effects requires students to be followed over time

[2] Both former and current exchange students and advisory group members (staff and faculty) have provided input for these assignments

Figure 1

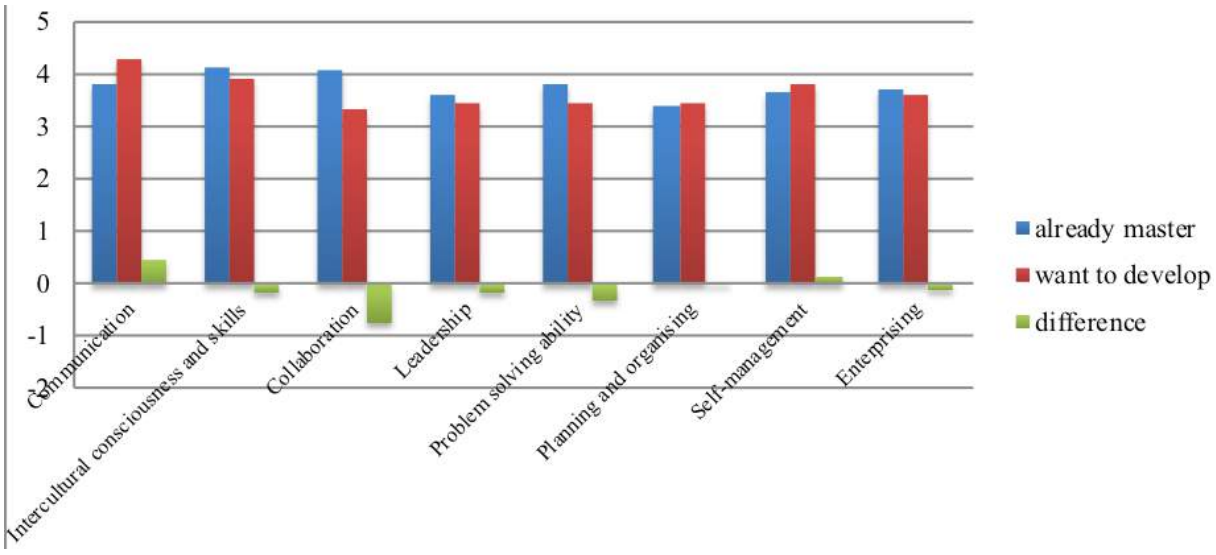
Overview of the Xchange learning trajectory: awareness, goal setting and reflection as key components



Findings and evaluation. Before departure, students believe to master best their Intercultural consciousness and skills, and Collaboration, followed by Problem solving ability and Enterprising skills. They strive at particularly developing their Communication skills, Intercultural consciousness and intercultural skills and Self-management skills, rendering the former and latter category to be the major skills to improve while being abroad.

Figure 2

Self-perception of employability skills already mastered and to be developed during exchange (72 undergraduate exchange students GeoSciences)



In evaluating the pre-departure meetings, students mentioned to like the self-reflection phase, and especially the awareness part: *"This [2nd] meeting, compared to the first, was about me as a person and how I can and want to change this – something I want to become aware of and from which I will always benefit from now on…"*. Finally, a student mentioned*".. I like to have been forced to think deeper about my exchange and the period beyond the 'honeymoon' phase…"*. Sharing experiences and expectations helped students to increase the awareness of the potential effects of intercultural experiences. The need for reflection however, was clear: *"Reflection: on what and why you want to do something. On how to change yourself if when you want to – or when you notice"*. Another eye-opener shared by a student: *"..to rethink my priorities and the goals I want to achieve"*. One student explicitly mentioned to have learned about *"the opinion of other people about myself – my own opinion about myself"*.

Students valued the personal and interactive approach in the pre-departure meetings, and mentioned that every student received time and attention in a friendly atmosphere with an interesting mix of theory, in-class exercises and interaction. However, students also remarked that critical self-reflection was rather difficult – one student mentioned to have preferred individual conversations with a trainer, instead of plenary pre-departure meetings.

3. Discussion and Conclusion

A stay abroad in another cultural context is not synonymous to learning. To actually learn from it, and reap the benefits of such stay abroad, activating forms of learning are often employed, including reflection. The first outcomes of two learning trajectories in our Geography programmes show that using reflection to enhance learning from a stay abroad is certainly not a 'one-size-fits-all'-practice. Both our cases show that students have difficulty to reflect, and do not always know how to reflect on their experiences abroad. As such, reflection remains often superficial, describing mainly how they engage with 'cultural others', and exploring the differences and similarities they encounter. More deeper forms of reflection —so analyzing the meaning of these differences and similarities on their own behavior— are often missing. This observation seems to point at a lack of what Holmes & O'Neill (2010, 2012) refer to as 'self-awareness': in order to analyze and evaluate the relationship with the other, one needs to have analyzed the 'Self'. This pleads not only for more attention for reflection in our curricula, by practicing it, but also for more guidance, in posing questions that force students to reflect on their own feelings, reactions and behavior: "what does it do to me, as a person, as an academic?"

The learning trajectories reveal the importance of favorable conditions for reflection and as such, learning from reflection. A first and crucial condition is a safe, inclusive and respectful classroom environment, in which students feel free to express and share their expectations. This requires the absence of dependency or power relations. A second condition for enhancing reflection of (expectations of) intercultural experiences, is to provide for an intensive interaction with peers and others. As self-reflection is hard, especially with limited time and experience, many students indicated to benefit from exchanging personal reflections with their peers, but also with insiders and trainers. A third and final condition to increase the role of reflection in the light of the learning trajectories described, is that reflection skills are practiced thoroughly and that exercises and assignments have clear instructions and guidelines. This also touches upon the literature debate on the optimal level of guidance during instruction (Kirschner *et al.*, 2006) to enhance transformative learning. The work of Moon (1999) and in particular her 'stages of reflection' (from description to deep reflection), might be of use here.

Finally, the PEER-model appeared to provide a useful framework for our trajectories with a relatively long stay abroad, with distinctive phases to structure reflection. For us, the value of the PEER-model is particularly grounded in the way students practice self-reflection, and develop and document their intercultural competences through time, giving insight into the process through which intercultural experiences add to learning. This enriches the experiences, empowers students via reflection, which, in the long run, will also strengthen their employability.

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Active Learning Methodologies to Strengthen Mathematical Basic Knowledge in Engineering Degrees

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Abstract

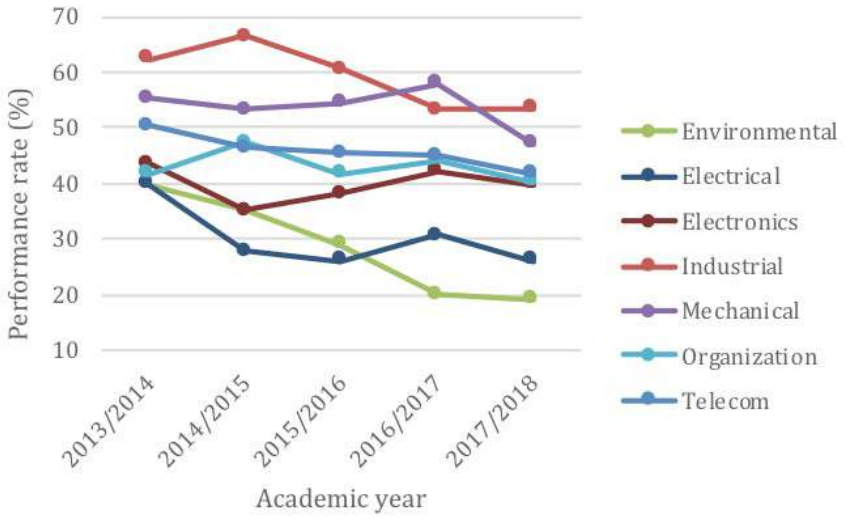
The results reported by the University of the Basque Country (UPV/EHU) for the academic year 2017-2018 showed that engineering degrees present low performance rates. The leading cause of such low performance rates might be the low level in mathematics acquired before enrolling in university. Math-related subjects constitute around 40% of the first academic year of any engineering degree and the basis to take more specific subjects. Therefore, the aim of this study was (1) to assess first-year students' basic knowledge on mathematics, (2) to detect knowledge gaps and (3) to address these gaps through active learning methodologies. A total of 376 students from seven different engineering degrees were enrolled in the study. Students took a test covering fundamental mathematical concepts that should have been acquired before enrolling in university. The test consisted of 54 questions divided into 9 blocks. Students presenting blocks with less than 66% of correctly answered questions were encouraged to use the specific multimedia material for each block designed to overcome the detected knowledge gaps. After four weeks to make use of the multimedia material, students took a second basic knowledge test to compute the improvement achieved with respect to the first test and to what extent the multimedia material helped students overcome the knowledge gaps. Students obtained a mean score of 5.60 and 6.55 out of 10 for the first and second tests, respectively. That is, an overall improvement of 0.95.

1. Introduction

The University of the Basque Country (UPV/EHU) publishes annually the academic results obtained in the last completed academic year. The last results corresponding to the academic year 2017-2018 showed that engineering degrees present one of the lowest performance rates (percent of number of credits successfully completed per total number of credits) [1-2]. Specifically, the Faculty of Engineering in Bilbao presented a mean performance rate as low as 38.2%. Figure 1 shows the time evolution of the performance rates for different engineering degrees offered by this Faculty of Engineering. The trend is clearly downward with a mean drop of 9.3% in 5 academic years.

Increasing the performance rate has therefore become a major concern among lecturers of the Faculty of Engineering. To achieve this goal, it is essential to know the leading cause of such low performance rates. Among possible causes might be immaturity of first-year students, incorrect choice of degree or the low level of qualification attained before enrolling in university. The latter could be the determinant in this case as mathematics is one of the subjects with lower passing rates of the university entrance exam [2], while math-related subjects constitute around 40% of the first academic year of any engineering degree and the basis to take more specific subjects. A solid basic knowledge on mathematics is a key factor to succeed in an engineering degree.

Figure 1
Time evolution of the performance rates for different engineering degrees of the Faculty of Engineering in Bilbao



Therefore, the aim of this study was (1) to assess first-year students' basic knowledge on mathematics, (2) to detect knowledge gaps and (3) to address these gaps through active learning methodologies [3-5] adjusted to the IKD (Ikaskuntza Kooperatibo eta Dinamikoa in Basque, Cooperative and Dynamic Learning) educative model from the UPV/EHU [6-7].

The article is structured as follows: a section devoted to the materials and methods is presented first analyzing the context and the methodology, followed by the results obtained in the study. Finally, the discussion and conclusions of the study are presented.

2. Materials & Methods

2.1. Context and motivation

There are 12 different engineering degrees in the Faculty of Engineering in Bilbao where 1140 new students enroll every year. In this study, a total of 376 students from seven different degrees were included. Concretely, those degrees were electrical (45 students), mechanical (68), automatic and industrial electronics (79), environmental (27), industrial organization (28), telecommunication (38), and industrial (91) engineering. Each degree is divided into four academic years where each year accounts for 60 ECTS (European Credit Transfer and Accumulation System). On average, 23 ECTS (39%) of the first academic year correspond to math-related subjects. These subjects provide the students with the necessary skills and knowledge on mathematics to be able to gain basic and advanced qualifications linked to each type of engineering. Precisely, the specific competence the student should acquire by studying these subjects is the ability to solve math-related problems that can be found in any engineering field. To be able to gain this competence, the sole prerequisite is to possess basic knowledge on mathematics. Unfortunately, students more frequently present knowledge gaps on these basic concepts making the acquisition of the specific competence even harder. This fact results (1) in a decrease in the number of students that passes these

subjects, (2) in an increase in the number of students that abandons the subject before examination, and (3) subsequently, in a decrease in the performance rate of the engineering degrees. Therefore, the aim of this study was to address these knowledge gaps through active learning methodologies and ultimately, to improve the passing rates.

2.2. Methods

The first week of the semester, students completed a self-assessment form and took a test on basic math knowledge. The self-assessment form gathered (1) information about students' pre-university level of mathematics such as the grades obtained in mathematics during the baccalaureate and in the university entrance exam, (2) students' opinion on the importance of mathematics (a value between 0 and 10) in the engineering degree they enrolled in, and (3) students' self-evaluations (a mark ranging from 0 to 10) of their knowledge on some basic math concepts. With respect to the basic knowledge test, it was intended to evaluate and quantify the real level students possess with regard to basic and fundamental mathematical concepts that should have been acquired before enrolling in university. The basic knowledge test consisted of 54 true/false and multiple choice questions divided into 9 differentiated blocks that covered different math concepts linked to Calculus and Algebra. The difference between students' presupposed and real level of mathematics was computed by using the results obtained in the self-assessment form and in the basic knowledge test.

The students were provided with the results obtained for each block of the basic knowledge test. Blocks with less than 66% of correctly answered questions were considered failed and therefore, those concepts not properly acquired. Students with blocks failed were encouraged to use the specific multimedia material for each block created by lecturers and made available online through e-Gela, the online teaching platform of the UPV/EHU. The multimedia material consisted of (1) videos, in which the basic theoretical concepts were explained and practical exercises were solved by the lecturers and (2) self-assessment tasks in which more advanced exercises were proposed together with the solution.

Students were given four weeks to make use of the material before taking the same basic knowledge test. Results obtained for this test were compared to those obtained in the first one in order to compute the improvement achieved and to what extent the multimedia material helped students acquire the necessary basic knowledge.

3. Results

The results obtained from the self-assessment form are summarized in Fig. 2 and 3 respectively. Fig. 2 presents a histogram that depicts the students' pre-university level of mathematics computed as the average between the grade obtained in mathematics during the baccalaureate and the mark in the university entrance exam. The average level of mathematics is represented by a dashed red line and it is around seven.

Regarding students' opinion on the importance of mathematics in the engineering degree they enrolled in, they considered it an extremely important subject rating its importance, on average, with 8.95 out of 10.

Figure 2

Students' level of mathematics calculated as the mean between the grades obtained in mathematics during the baccalaureate and in the university entrance exam. The average level of mathematics is depicted with a dashed red line

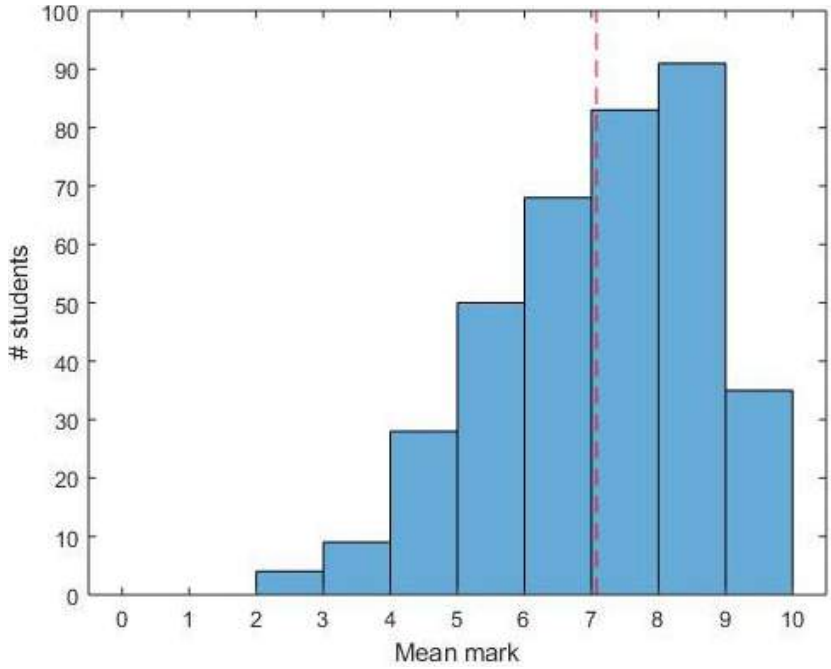


Fig. 3 shows the comparison between students' self-evaluations of their knowledge (blue bars) and the real knowledge they possess (red bars). Results are reported individually for each one of the nine blocks (from BI to BIX in ascending complexity order) into which the basic mathematical concepts were grouped. The real knowledge the students possess was computed from the results obtained in the first basic knowledge test.

Figure 3

Block by block comparison of students' self-evaluations of their knowledge (blue bars) and the real knowledge they possess (red bars)

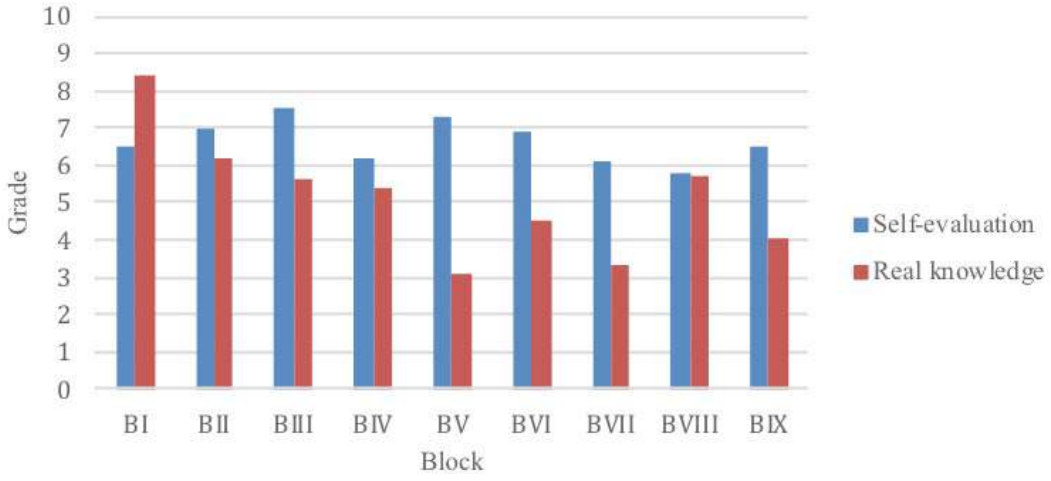
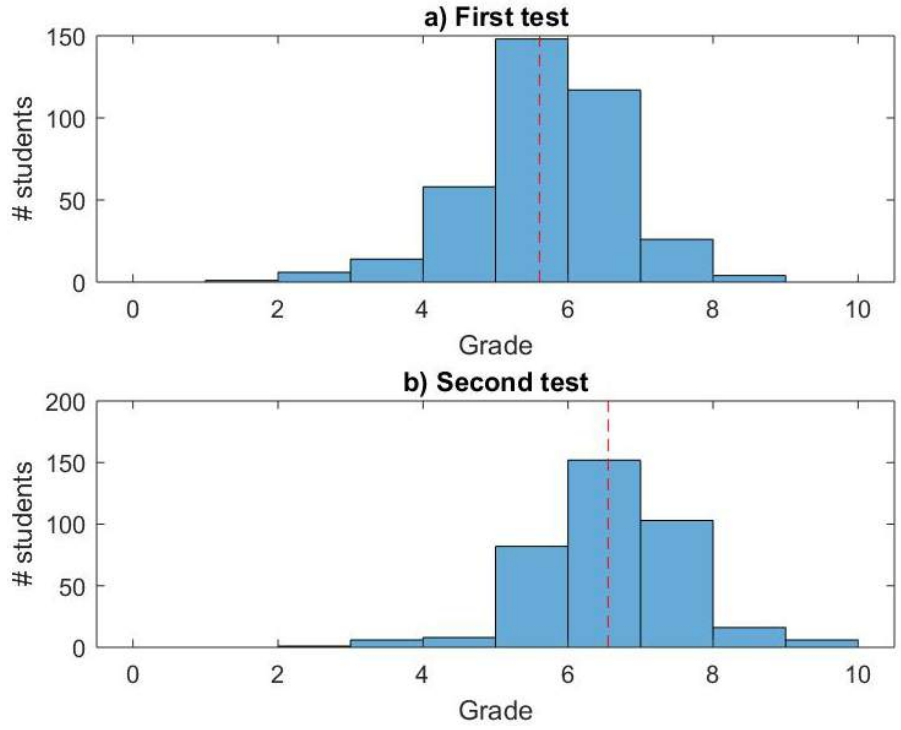


Fig. 4 shows the distributions of the grades obtained by students in the first (panel a) and second (panel b) basic knowledge tests. The red dashed line in each panel depicts the mean grade which resulted in 5.60 and 6.55 for the first and second tests, respectively. An overall improvement of 0.95 out of 10 was achieved from one test to the other.

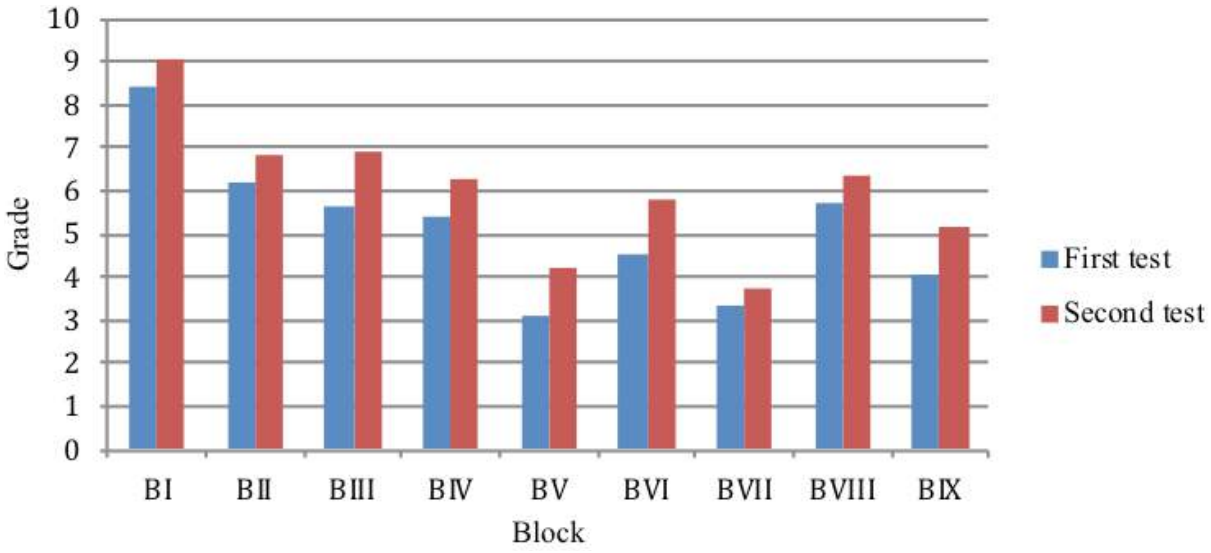
Figure 4

Grade distribution for the first (panel a) and second (panel b) basic knowledge tests. The mean value is depicted with a red dashed line



On the other hand, students' mean performance in the first (blue bars) and second (red bars) tests is presented individually for each block in Fig. 5. An estimate of the overall improvement achieved in each block can be obtained by computing the difference between students' performance in each test.

Figure 5
Students' mean performance for each block
in the first (blue bars) and second (red bars) tests



4. Discussion

This study assessed first-year students' basic knowledge on mathematics through self-assessment forms and tests on basic math concepts. The analysis of the obtained results evidenced students' knowledge gaps that were addressed through the specific multimedia material created by the authors of this study.

The self-assessment forms reported an average pre-university level (mean between grades obtained in mathematics in the baccalaureate and in the university entrance exam) in mathematics of 7.07 out of 10 (see Fig. 2). Although it might seem good enough, it could be a rough estimate of the real mathematical basic knowledge that students possess when they start the degree. The grades considered to compute the level in mathematics correspond to metrics obtained during the last two years (baccalaureate) and 3 months before (university entrance exam) starting at university. For this reason, the students' pre-university level in mathematics was compared to the actual/real level quantified through the first basic knowledge test. The overall results showed a difference of 1.47 out of 10 between pre-university (7.07) and real levels (5.60).

Similar differences were also found when comparisons between students' self-evaluated and real levels were made individually for each one of the nine blocks into which the basic mathematical concepts were grouped. As shown in Fig. 3, students have a clear tendency to overestimate their level (in 8 out of 9 blocks), and only once (block BI, the less complex one) they underestimated it. In five of the blocks (BIII, BV-BVII, and BIX) students' estimations were above or close to 2 points of their actual level.

The students' performance in the first basic knowledge test (mean grade of 5.60) was considered inadequate (see Fig. 4). It reflected the lack of a solid basis on those mathematical concepts that are supposed to be acquired in the pre-university stage and compose the prerequisites to take any subject from an engineering degree. Despite this, students are aware that mathematics are of the utmost importance in the engineering

degrees as can be concluded from their self-assessment form where they rated its importance, on average, with 8.95 out of 10. Nevertheless, students' performance in the second basic knowledge test improved and resulted in a mean grade of 6.55 closer to their pre-university level (7.07).

Similar improvements can be observed in Fig. 5 where students' mean performance is represented block by block for the first (blue bars) and second (red bars) tests. Improvements were observed in every single block and a mean improvement by block of 0.89 was reported.

These improvements might be motivated by (1) students' awareness of their low performance in the first basic knowledge test despite the great importance they know mathematics have in an engineering degree, and (2) the use of the multimedia material to address their knowledge gaps. However, the improvements were not as great as expected by authors. On the one hand, students' mean performance in the second basic knowledge test (6.55) did not meet the 6.66 (66% of correctly answered questions) minimum requirement established by authors to consider the basic knowledge correctly assimilated. On the other hand, there were blocks (BV and BVII) where despite the improvement, the mean performance was quite below five. Hence, some basic mathematical concepts remain unknown or not properly assimilated by most of the students.

One possible reason why the improvement was not as substantial as expected could be the not generalized use of the multimedia material. Unfortunately, the use of the multimedia material by students was presupposed, and not measured. Therefore, the low improvement cannot be certainly attributed to the lack of use of the material. Another possible reason might be the lack of motivation of some of the first-year students that ultimately drop out of the engineering degree. Anyhow, further studies must be carried out to address the main limitation of this study by measuring the use of the multimedia material and assessing its effect on students' performance.

5. Conclusion

The study evaluated first-year students' basic knowledge on mathematics through self-assessment forms and tests on basic math-related concepts. The results showed that students presented knowledge gaps that had to be addressed in order to succeed in an engineering degree. Multimedia material was made available to address those gaps. Students took a second test to assess whether basic math-related concepts were correctly assimilated. The improvement was not as good as expected by authors possibly because of the not generalized use of the multimedia material.

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Learning strategies, personality and mindset among first-year biology students

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Abstract

Approaches to learning correlates with learning outcomes. Choice of learning strategy depends on a number of factors, including personality, mindset, and experiences from previous studies. In the present study, we have investigated variation in learning strategies, personality and mindset among first-year biology students at the University of Bergen. We investigated the distribution of students on surface, strategic and deep learning strategies, as well as the correlations between learning strategies and personality traits (big five: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience) and mindset (fixed or malleable). The project started in the autumn 2018, and the data were collected in January 2019. Here, we will present preliminary results for learning strategies and mindset.

1. Introduction

The goal of all teaching is learning. To ensure that, we need to know our students. Approaches to learning correlates with learning outcomes (Trigwell, Prosser, & Waterhouse, 1999). Many students apply suboptimal learning strategies, resulting in shallow understanding and forgetting after the exam (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). Learning strategies is often sketched as a dichotomy: deep or shallow (Asikainen & Gijbels, 2017). Deep learners seek understanding, to delve into reasons, search for the why's and how's of knowledge. Shallow learners seek reproduction, to remember the bits and parts of knowledge, and pass their exams. Some students are neither exclusively deep nor surface learners. Strategic students pick the approach they find suitable, based on interests and perceived usefulness of the topic or a good mark (Chamorro-Premuzic & Furnham, 2008).

Choice of learning strategy depends partly on personality (Chamorro-Premuzic & Furnham, 2008), mindset (Yan, Thai, & Bjork, 2014), and experiences including previous studies (Baeten, Struyven, & Dochy, 2013). Many courses at bachelor level in biology emphasize factual knowledge, which might induce surface learning strategies (Momsen, Long, Wyse, & Ebert-May, 2010). Changes towards more problem-oriented, open tasks including creativity and some freedom might increase the degree of deep learning. Other correlates are not that easy to manipulate. A number of studies have found correlations between personality and learning strategies (Chamorro-Premuzic & Furnham, 2008, 2009; Kokkinos, Kargiotidis, & Markos, 2015).

The probably most influential model of personality in research has been the Five Factor Model, where personality is measured along five major scales: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience (Kokkinos *et al.*, 2015). Among these, conscientiousness —the ability and willingness to work systematically to achieve your goals, including self-discipline and hard-working attitude— has been the most reliable correlate of academic success, more so than intelligence (Kokkinos *et al.*, 2015). Openness to

experience, which summarizes creativity, intellectual curiosity and imagination, correlates with intrinsic motivation and deep learning strategies (Chamorro-Premuzic & Furnham, 2009). High-scorers on openness thrive with problem-based learning (Scherer & Gustafsson, 2015). Personality is partly genetic and partly modified through childhood and adolescence, and still somewhat malleable in adults.

Another correlate of learning strategies is mindset (Yan *et al.*, 2014). As postulated by Carol Dweck (2006), mindset appears in two extremes: fixed or malleable. A fixed mindset conveys a belief in the predisposed, that ability is something you have and cannot change, not by effort and not by will. You are what you are and have to live with it. A malleable mindset translates into a belief in change; you can increase your abilities, grow and succeed despite background and genetics. Intermediates are possible, and often the rule: for example, it is possible to have a growth mindset in arts and a fixed mindset in mathematics ("I need to exercise to improve my drawings, but I am stupid at math"). Dweck's punchline is not the variants of mindset, but their effect: if you believe effort is useless, you're not doing it. At least not effectively and with engagement. If you believe effort makes a difference, you're more able to pursue your goals – simply because you try. Despite the drawbacks that sooner or later will appear. For all. As long as you have success, a fixed mindset might not seem to have any negative consequences. You might be good at math and everybody tells you that you got a talent for it, and you're still good at math because the tasks at school are easy. Until the tasks are not easy anymore, maybe in the second year at university, and you're entrenched in this story of talent and thinks you cannot improve.

Effort is not the opposite of ability. On the contrary, effort and ability might be somewhat aligned, as early success might induce more effort (Winner, 2000). A growth mindset correlates with intrinsic motivation and deep learning strategies (Yan *et al.*, 2014). Interesting, Macnamara and Rupani (2017) and Bahník and Vranka (2017) did not find correlations between mindset and academic results. People with growth or fixed mindsets does not seem to differ in their abilities, only in their reaction to challenges or adversities. Sisk, Burgoyne, Sun, Butler, and Macnamara (2018) concluded that mindset interventions might be most useful for students from low socioeconomic status or students academically at risk.

The various correlates among personality, mindset, and short-term experiences with teaching and learning strategies circles around an underlying question. Is education 'fair'? Nature and nurture, interventions and achievement gaps are important concerns if we want educational success for all (or many). These questions will not be further discussed here, but we recommend the recent review of Sokolowski and Ansari (2018) and the easily accessible article of Willingham (2012) for interesting points of view.

A number of studies report from large groups of students at their first year of university (Vermunt & Donche, 2017), but investigations of variation within groups are asked for (Vanthournout, Coertjens, Gijbels, Donche, & Van Petegem, 2013). In the present study, we have investigated learning strategies, personality and mindset among first-year biology students at the University of Bergen. We have also collected data on gender, branch of study within biology, age, and the number of ECTS credits. A follow-up study of older students is planned, to investigate changes through time and years of experience with studying. Asikainen and Gijbels (2017) point out that the development of learning strategies might follow individual trajectories, and might differ among groups of students.

Here, we will present preliminary results for learning strategies and mindset.

2. Methods

First year student in biology at the University of Bergen have answered a questionnaire regarding learning strategies (Vermunt & Donche, 2017; Vermunt & Vermetten, 2004), personality (Johnson, 2014) and mindset (DeBacker *et al.*, 2018). The questionnaire included 120 questions about learning strategies and learning patterns, 120 questions concerning personality, and 6 questions related to mindset. A likert scale with five alternatives was applied on all items. The questionnaire was answered on paper, and the resulting data were written in a worksheet and proofread. The statistical package R was applied in the analysis of data. Altogether 63 students answered the questionnaire in January 2019.

The mindset questions were complemented with qualitative interviews for a more in-depth understanding of the student responses. Five biology students participated in the interviews. The interviews were recorded on an audio device, transcribed soon afterwards, and analysed using NVivo. Three master students are conducting their thesis work as parts of the project, which combines quantitative and qualitative approaches.

3. Interactive Results and Discussion

Our presentation at eurosotl 2019 in Bilbao will be interactive. We will visualize our results in a prezi and engage the audience with an online quiz asking for predictions of our results (Lang, 2016). We will also include questions for reflection and discussion among the audience (for instance, how to influence students awareness of good learning strategies and potentially induce changes in learning strategies). We do not want to spoil these surprises. On the other hand, we enjoy a prepared audience. Our solution is to present some background information and then our questions. You have to visit our talk to get more results, but a few main findings are summarized in the conclusion for those not attending.

Surface and deep learning are the most frequently mentioned learning strategies in the literature. Nobody wants surface learners. They're collecting knowledge as isolated facts, cramming for the exam, and forget everything as soon as possible afterwards. On the contrary, everybody loves the deep learners. They're the perfect endless striving hunters of knowledge, collecting and comparing, analyzing and evaluating, conquering the pyramid of Blooms taxonomy like Everest mountain climbers. In addition, some students are strategic, cherry-picking strategies according to goals and interests. Some students are application oriented, preferring the useful and practical if possible.

The first question for our audience at eurosotl Bilbao is: Which strategy is the most prevalent among the students in our study?

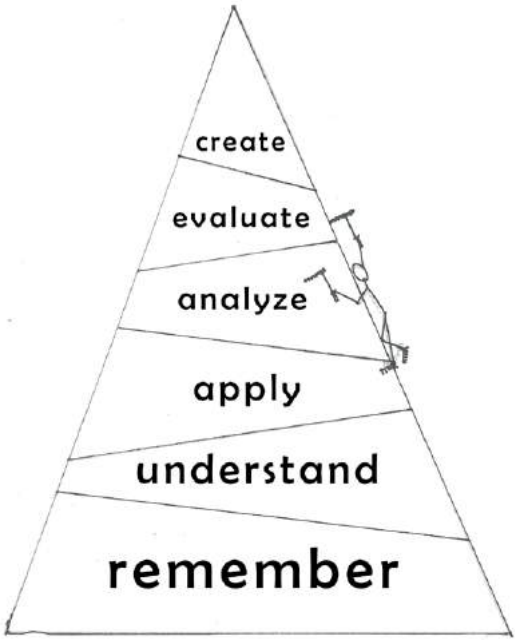
1. Surface.
2. Deep.
3. Strategic.
4. Application.

Your guesses will be compared with our results. The revelation will be followed by a short question for reflection: Why do you think the biology students in our study had these preferences? Think-pair-share!

Mindset is frequently proposed as an influencer on achievement. The main difference is between a fixed and a growth mindset. A fixed mindset means that you believe you are

stuck – your abilities, your genes, your background defines you. A growth mindset means that you perceive your future as flexible, effort pays off, and you can work hard and get what you want. It's also possible to have a kind of mixed mindset, depending on the sort of task, or believing that both genetics and effort have effects on your results.

Figure 1
Climbing Mount Bloom. More deep learning at the apex, with problem solving, analyzing and evaluating



After Anderson *et al.* (2001). Drawing: J. Nyléhn.

Our second poll questions is: Which kind of mindset was most prevalent among the students in our study?

1. Fixed.
2. Growth.
3. Mixed.

We based our questions about mindset on three items applied in other studies, for instance DeBacker *et al.* (2018). The original items used the word "intelligence", for example, "You have a certain amount of intelligence and you really can't do much to change it". As "intelligence" has a lot of connotations and different meanings, we wanted to investigate whether students answered differently for "intelligence" versus "abilities". Thus, we included the three items from DeBacker *et al.* (2018) that applied "intelligence", as well as three new questions using "ability".

What do you think: did we get different results with the word "intelligence" compared to "abilities"?

1. No, rather similar percentages.
2. Only small differences.
3. Word, that's totally different!

The effects of changing a single word with a related meaning has significance for the validity of the items. In our study, the mindset questions were supplied with in-depth interviews to ensure a richer data material on students beliefs about whether intelligence and abilities are inborn or changeable through effort. There's a lot of connected and partly overlapping concepts, both included in the study (as related to learning strategies, personality or mindset) or brought forward by the interviewees (like motivation, talent, intellect, and much more). To translate and construct items that work well within our Norwegian biology context has been an important part of the project. An analogy could be to find a useful path through a jungle.

Figure 2

What would Indiana Jones do in the Concept Jungle?

Drawing: J. Nyléhn.

Now we turn to you, and we want your take on another question: Do you think it is possible to exercise your own intelligence?

1. Of course.
2. Within limits.
3. No, that's genetics.
4. No, I'm too old.

Some of you might have preferred the alternative "that depends on the definition of intelligence". Which is our next discussion: What is intelligence? Think-pair-share.

The answer will probably be different for fluid intelligence versus crystallized intelligence (Primi, Ferrão, & Almeida, 2010; Thorsen, Gustafsson, & Cliffordson, 2014), but see Sternberg (2008). It should be rather obvious that crystallized intelligence can be increased by effort – as knowledge and skills are included in the definition. The possibilities to change fluid intelligence is more open for discussion (and further research).

Deep and strategic learning seems more suitable than surface learning strategies. We have two final questions: How do we increase the degree of deep learning? How can we

increase students' awareness of better learning strategies? We want you to share your ideas. Think-pair-share.

4. Spoiler Alert! Conclusions

For those not attending our talk, we will summarize a few results:

— The first-year biology students at the University of Bergen were predominantly application oriented. Surface and deep learning strategies were also represented in the sample.
— Most students seem to advocate a mixed mindset: partly fixed, partly flexible. Effort is useful, but there's also limits for what you can achieve.
— The respondents answered differently for intelligence and abilities, which shows the necessity of careful translation. The associations were different, and choice of word influenced the results.

This is a preliminary report from an ongoing project. A follow-up study will investigate the development of learning strategies and mindset during the years of higher education in biology. You will also have to wait for our results on personality, for example at the next eurosotl conference.

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Flexible assessment: its impact on sustainable learning and contribution to the future of higher education. International Marketing Classroom Report

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Abstract

According to experts, the ideal assessment practices are currently far from today's reality. Flexible assessment is discussed as a possible way not only to increase motivation, but to improve teaching and to boost learning outcomes of students. Further research, particularly based on case studies, is needed to determine the relevance and importance of these aspects and to develop possible solutions. By following the mentioned calls, we offered flexible assessment 2 years in a row in the context of international marketing course for graduate students, in order to explore and to gain insights into this topic by empowering students to individually choose the format of assessment. This research aims to explore whether and how in particular flexible assessment can contribute to sustainable learning and suit different student personalities and needs. Addressing these questions through the mixed-method design, with a pre-dominance of qualitative approach, this paper contributes to overcome the lack of knowledge on new assessment forms and their meaning for the future of higher education in general. According to results, flexible assessment is not yet very well known by students, but has been positively perceived by the vast majority. Most students named the offered flexibility in formats empowering and enriching as well as recommended to continue offering this novel assessment approach in the future. This paper considers also the potential transferability of flexible assessment and its practical implementation in daily teaching practice, by paying additional attention to possible disadvantages and linked risks as well as lists sufficient implications for the upcoming research.

1. Background

1.1. Assessment and Flexibility in it Defined

Boud *et al.* (2006) sees following purposes of assessment in higher education: 1) it is about giving feedback to students on their learning on one hand and 2) certifying their achievement on the other and argues farther that we can improve the quality and effectiveness of learning and teaching by improving assessment practices (Boud, 2010). Flexible assessment is proposed as one of the possible ways of the mentioned improvement, bridging the current changes in higher education from teacher centred to learner-oriented pedagogy, in which students are more actively involved in the learning process and get more flexibility (Wanner *et al.*, 2015). Rumsey (194, p.20) offers the following definition: "assessment practices are flexible if they can accommodate the scope of knowledge and skills encompassed by the assessment criteria, the variations in context in which assessment may be conducted, and the range of needs and personal situations of potential candidates". Further studies show and describe various approaches how to possibly implement flexible assessment by giving students a free choice over the assessments weighting, type or format, the timing, the criteria, or the overall assessment result (Pretorius, L. *et al.*, 2017; Irwin & Hepplestone, 2012; Varlavsky & Rayner, 2012; McCurdy, 2000; Francis, 2008). Due to Wanner (2015) summarize flexible assessment as a changing assessment practice, which is rather learner-centred and more directed as

well as mostly about "learning-oriented assessment" (Carless, 2007) where assessment as learning and for learning (formative assessment) and not only of learning (pure summative assessment), is part of the assessment as an own process (Wanner *et al.*, 2015; Boud, 2010, p. 3).

1.2. Theoretical Frameworks

By investigating the theories, which could explain the meaning and the impact of flexible assessment, one discovers immediately that there are different paths researchers follow in order to explain this novel pedagogic approach and to find any possibly existing causal relationship to better learning and teaching itself. Some recent studies have shown the impact of flexible assessment on student's motivation, engagement and performance by applying the theory of self-regulated learning, which supposedly increases autonomy, self-control, professional expertise, as well as self-improvement (Pacharn *et al.*, 2013). Others in turn, like Ryan and Deci (2000), have investigated the theories behind effects that rewards, feedback, and communication have on motivation. Their "Self-Determination Theory" argues that, for example, rewards and positive performance feedback makes the students feel competent and enhances their intrinsic motivation (Ryan & Deci, 2000). Accordingly, choice, acknowledgement of feelings, and opportunities for self-direction were found to enhance intrinsic motivation because they allow greater feeling of autonomy. Another theory "Four Dimensions of Motivation" by Bandura (1996) lists four different dimensions indicators: competence to complete the task, control/autonomy over outcome of the action, interest/value in the task, relatedness with regards to social rewards and approval, like belonging to a classroom, social group (Bandura, 1996; Dweck, 2010; Murray, 2011; Pintrich, 2003; Ryan & Deci, 2000; Seifert, 2004). Whereas the rest of research community, interested in this topic, state flexible assessment as supported by learning theory (student-centred or learner-centred), which claims that allowing students to make choices is a major aspect of teaching that promotes learning (Jackson, 1997). Assuming this, Irwin and Hepplestone (2012) add that student-led pedagogy would be suitable assessment method of higher education institutions for the future.

1.3. Sustainable Learning and the Future of Higher Education

Having the future of higher education in mind, buzzwords like sustainable learning as well as transformative teaching appear and have been discussed by scientific community in recent days often. By analysing current challenges which pedagogy face, Wanner (2015) introduces six ideas, identified by Ryan and Tilbury (2013), which are all about transforming teaching and learning as well as creating an increasing flexible, future oriented higher education system (Ryan & Tilbury, 2013), these are: 1) future-facing education, 2) decolonising education, 3) transformative capabilities, 4) crossing boundaries, 5) social learning and last but not least – 6) learner-empowerment. The intent of a sustainable learning atmosphere is "to create and proliferate sustainable and renewable curricula and methods of learning and teaching that instil in people the skills and dispositions to thrive in complicated, challenging, and ever-changing circumstances, while contributing positively to making the world a better place" (Hays & Reinders, 2018). Also, Graham (2015), recognizes sustainable learning as being "essential for an individual's future life in an ever-changing world" and students may apply and develop the acquired knowledge, skills, attitudes and values effectively during their entire life (Graham *et al.*, 2015). It should not be forgotten that current students at our universities will most probably have influence on our society. Thus, sustainable, future-oriented learning is a crucial virtue for adjusting life approach in the decades to follow. In the course of this, flexible assessment, as a novel approach and a learner-oriented one, can presumably make a meaningful contribution to the future of Higher Education.

2. Methodology

Taking under considerations the SoTL context as well as due to the fact that this research, announced as an innovative teaching project, has been carried out twice within 2 years period (2017, 2018) in the context of International Marketing course for graduate students at the Vienna University of Economics and Business, aimed to facilitate and better understand the phenomenon of flexible assessment's novelty by exploring the essence of students' experiences with it and describing their perceptions of the newly introduced assessment type, as well as furthermore investigate its impact on sustainable learning, the mixed-method approach in the phenomenological tradition of mainly interpretive nature has been chosen as the best suiting the purpose of research (exploration), the chosen unit of analysis (students view, learner-oriented) and set research questions (what and how) and expected outcomes (transferability and applicability). Against this background, this research aims to address the following research questions:

> RQ1: Whether and how in particular flexible assessment, as a student-led pedagogical approach, can suit different student personalities and needs as well as contribute to sustainable learning?
>
> RQ2: What are the advantages and disadvantages, limitations, consequences of the use of flexible assessment in higher education as well as how the applicability and transferability of this format can be achieved for future teaching?

2.1. Data Sources, its Collection and Analysis

Several researchers identified as critical by using a mixed method to precisely define the extent, timing and the prominence given to each approach as well as how the findings should be integrated (Greene, 2007; Leech and Onwuegbuzie, 2009; O'Cathain *et al.*, 2008; Creswell *et al.*, 2003). Therefrom, in current investigation quantitative method was used to partial extent whereas the qualitative one plays a dominant role. In terms of timing the methods have been applied sequentially hence we started with quantitative followed by a mix of qualitative methods. In particular, in the 1st year we first of all informed the students attending our course about all details of this innovative flexible assessment project well in advance in written (via syllabus, available far before the registration to the course) and oral form (first unit of the course). Then, at the end of the course, we prepared a short questionnaire with mainly closed type of questions, although we left some space for comments, in order to get first impression and a big picture in numbers of how it has been perceived and whether it has any sense to offer it ever again, which resulted in descriptive statistics by showing the opinion of 40 (out of 44 participants) anonymously attended students.

At the very last session, a topic-based moderated small group discussion (2 groups, 21 and 23 persons each) with predominately open-end questions, was conducted in a semi-structured manner as well as observed and recorded by a second, non-involved participant. The descriptive statistics due to results of questionnaires as well as outcomes of the mentioned final group discussions (observer's notes put in written form), helped us to fine-tune our research, to specify and modify the assessment criteria for the second year plus to generate further explorative questions for the subsequent qualitative part of our research. In the 2nd year we repeated our innovative project in a slightly adapted form, integrated in the same international marketing course but for other students (next cohort), by offering them again a free choice of the assessment format for an individual assignment, which made 40% (partial) out of total (summative) 100%, like the year before. The suggested adaptations were: naming of even more precise formulated assignment criteria, ensuring the given comparability of all

delivered formats, more detailed explanation and examples of various acceptable assessment formats, giving more time for preparation in order to motivate students to choose a format suiting them best, instead of choosing a format which easily suit the deadline. Shortly after the last course session, 15 persons out of 43 students, both local and exchange students, female and male, have volunteered to participate and share the experiences in a context of a semi-structured, in depth, face-to-face interview, which lasted 30-60 minutes each. The qualitative interviews have been transcribed and undergone at the end the same procedure as a protocol of group discussions from the 1st year - thematic analysis, which is meant as the process of identifying and analysing patterns or themes within qualitative data.

3. Results

3.1. Descriptive Statistics

The results of the descriptive statistics are illustrated in the Table 1 below.

Table 1
Results of descriptive statistics

Questions and answers	Course year 1	Course year 2
Choice of assessment		
Written report Oral presentation Creative form	67,5% 30,0% 2,5%	60,47% 27,91% 11,63%
Sufficient choice of assessment		
Yes No Maybe some more formats	80,0% 12,5% 7,5%	
*Influence on motivation**		
More motivation Equal In doubt	75,0% 22,5% 2,5%	
*Influence on learning results***		
Positive Negative In doubt	72,5% 7,5% 12,5%	
*Future****		
Yes No In doubt	90,0% 7,5% 2,5%	

* Question on how far the opportunity to flexibly choose the assessment format influence student's motivation in the class.
** Question on possible interrelation between flexible assessment and better results in learning.
*** Question on whether the free selection of different assessment formats should be offered in the future. These outcomes lead us to further investigation of the aspects, influencing factors and possible explanation while having small group discussions in the first year and interviewing in the second year.

3.2. Study/ Higher Education. Associations and Difficulties

Remarkable is the fact that most frequently noticed associations of students were learning, pressure, assessment, exams, presentations, learning by heart. Furthermore, students stated schemata, set criteria and strict rules that have to be followed in order to receive a positive result as an additional association. It seems to be easy and desirable for the bigger part of interviewed students, if educators give examples, to underpin their explanations as well as a given opportunity to self-study and most of all - involvement of and co-design by students as well as cooperation with other classmates. On the contrary, learning by heart or better to say the necessity to learn by heart in courses in order to pass, has been stated by the vast majority on the first place and called not only difficult, but even useless. Furthermore, too many regulations and instructions by at the same time being frequently too indefinite, unclear have been mentioned as a frequent trouble. Frontal teaching was named as a next negative aspect. Another interesting aspect was mentioned in terms of pressure to perform at the exact given date, like an exam. Many students found it challenging to manage schedules and to be forced to deliver "on click". Finally, some of learners complained about too theoretical approach as well as style of teaching (frontal teaching) to be outdated and not related to the practical world.

3.3. Assessment: Preferences

The preferences vary a lot. From tests and exams in which multiple-choice variant was named a least favourable, because in the student's eyes - it is just an excerpt of the obtained knowledge. To presentations, especially by students who have no difficulties to speak freely about any topic, even if in fact the majority argued that presentations teach helpful skills for the future work life. Followed by group work – e.g. due to possibility to share the workload and complete each other as a team. But also written assignment seem to be liked, particularly if students like writing as a process and appreciate getting a chance to reflect upon a content. As well as innovative formats for rather creative minds – nearly every format have been mentioned either in a small group discussion or by students interviewed face-to-face. Most students plead for a good mix of formats within a summative assessment and don't care much of each single assessment within. Apparently, the type of personality and previous experience might have an impact on students' preferences on assessment criteria and thus lead us to farther questioning, which exactly form, and what reason for, has been chosen this time.

3.4. Flexible Assessment

a) *Perception of it and pre-knowledge*

Due to outcomes of questionnaires, small group discussions and in-depth one-to-one interviews, the absolute majority of the students have shown a positive reaction for giving them a free choice of the assessment formMoreover, enhanced creativity and greater feeling of freedom were mentioned a lot of times. Most of attended have never experienced the flexible assessment form before and were grateful to be given this trial. This in turn resulted in more appreciative, productive working atmosphere in the classroom and supported the teaching process.

b) *Chosen form and reasons*

To sum up, there are 3 main tendencies been discovered, explaining the format chosen as well as the possible background of made choice:

i. Traditionalists (proven way is secure)

An impressive part of students has admitted to have chosen a "safe format", where they feel experienced enough and which they are rather used to do more often while studying.

ii. The path of least (resistance, workload, time consume)

While another substantial percentage made their decision based on schedules and/or estimated workload, which was subjectively perceived as the least or easiest due to various individual abilities.

iii. Challenge or variety seekers

And last but not least, some few others seemed to have been seeking a challenge or simply wanted to try something out, to have a variety of formats and were glad to face a new, previously undiscovered form to be assessed in.

c) *Need in extended selection of formats*

While in both years we equally offered a free choice of assessment formats, the number of named examples for different creative types increased in the second year, based on results generated in the first year.

Despite the great variety given, still only a minor part of participants decided to try out the creative form to be assessed in. Asked for the reasons, mostly students explained it with insecurity and missing experience in terms of new formats and said it would require more exact criteria and "show me how" examples.After all, several voices pointed out that the choice and mix of assessment forms are preferable and in total a good balance is the key.

d) *Discovered interrelation*

i. Diversity and inclusion aspects

Every interviewee stated that, from their perception, there is a correlation between differences in personalities and assessment preferences. Moreover, differences in life situations, abilities, needs have been mentioned as an impacting factor on preferred assessment format as well. However, the main driving force seem to lie in getting a good grade by focusing on own strengths. However, some students argued that by all respect to diversity, everybody should be adaptable and able to perform in several assessment styles.

ii. Motivation, engagement

Two main statements have been recognized and clearly stand out. Most interviewed students argued that flexible assessment increases motivation to attend and perform the task. The main arguments were more fun through given choice, thinking out of the box with new formats and an intrinsic motivation increased by having freedom.

iii. Performance, outcomes

With regards to any change of their performance, students speak of „superior learning experience" and explicate that the given flexibility allows to emphasize on strengths which then results in better final performance.

e) *Contributing aspects*

Overall, every student, except one (Int. 4, L. 126-128), viewed flexible learning as enriching for deeper and more sustainable learning. As mentioned in the interviews, it would broaden the horizon, and encourage students to give their best, help them to evaluate their strengths and weaknesses; and generally, look deeper into the material and learn for the future.

i. Deeper sustainable learning

Thus, the given choice allows students to rather focus on the topic, so they can learn more instead of focusing on their presentation or memorizing skills. And students speak of, as a long-term consequence, developing an ability to learn better for and in the future, which they might learn through given freedom of choice. However, it is not only about learning more or better content, but also to finally be in a situation, which allows learners to learn more about themselves, by getting more self-aware.

f) *Advantages, learning effects and benefits*

Through the given freedom of assessment form's choice, students feel to finally being seen, recognized and accepted in their otherness and diversity of needs, skills, personalities, life situations etc. and thus seem to lead to deeper, more sustainable learning effects. Furthermore, some of the students report that flexible assessment somewhat forces them to automatically reflect on their own needs, preferences, priorities and could, by having this offered more frequent, lead to increased self-awareness of the students.

Moreover, most students argued that flexible assessment increases motivation to perform the task, due to having more fun through options to choose, thinking out of the box and thus report from better performing at the end. Due to variety offered, students can additionally benefit from each other's knowledge.

g) *Disadvantages, limitations, log-term consequences*

Not many students have mentioned disadvantages of flexible learning, as the overall tendency towards flexible assessment was rather positive. However, some students claimed that by having a choice, they would prefer the option with less effort, the easier way and doubted in this case the positive effect. Others stated that students would choose the option which fits those most in order to get a good grade, so that they would not need to reflect on their weaknesses and develop new abilities.

3.5. Transferability and Implicability in a Daily Teaching Practice in the Future of Higher Education

Concerning the future of flexible assessment and its transferability, most students argue that it is a very suitable assessment method. However, implementation of flexible assessment

has its limitations. For instance, most of the students consider offering this option only or mainly at a graduate or postgraduate level as reasonable. Undergraduate students would probably need more guidance and structure and possibly be overwhelmed/confused/ irritated with this option, especially on the very beginning of their study. Likewise, the size of groups and number of attending students, which usually vary between undergraduate, graduate and postgraduate courses, has been recognized as a limitation by some students. Moreover, likely, some certain subject areas/courses, like language courses or marketing fields, may have higher chances to rather successfully integrate flexible assessment in formats than lectures in mathematics, statistics etc.

In addition, it is important to mention, that such a positive reaction of students is based on a fact that flexible assessment has been offered as a partial individual performance assessment (40% out of 100%). Consequently, to offer flexible assessment for the total 100% of performance, would have other challenges to deal with, as e.g. that students will possibly try to completely avoid any challenges by choosing the easiest way and as a result, certain abilities (such as presentation or other skills) will not be developed at all. And due to the fact, that creative formats of assessments seem not being offered very often, one need to first of all give enough preparation time and secondly offer a lot of support about "how to" proceed (tutorials, software and hardware support, examples etc.), in order to convince students to try it at least out.

4. Reflection

This research has shown that flexible assessment is not yet very well known by students and thus might act confusing to some, but has been positively perceived by the vast majority. Most students named the offered flexibility in formats empowering and enriching as well as recommended to continue offering this novel assessment approach in the future. The contribution of it to a deeper, sustainable learning, increased motivation and better performance has been observed and mentioned by a lot of involved learners.

In spite of overall positive perception of offered flexible assessment and defined recommendations for its potential transferability and applicability, there are still some open questions to clarify and need additional research.

In particular, this research took place in Austria, at the Vienna University of Economics and Business, which is first of all a geographical as well as single-university limitation and call for further cross-country or cross-university research, in order to find out whether the same perception can be achieved by including different regional and university specific aspects. Moreover, this investigation was conducted with graduate students only within a course of international marketing. It's obviously to test how far the transfer of this experience is also assured at other levels: undergraduate, graduate, postgraduate as well as by including of it in other course subjects and again underline the necessity in more investigation.

Likewise, the methodology has its limitations and call further researchers to take over and continue the investigation of this future-oriented teaching and learning approach. For instance, our research aimed mainly explorative and descriptive character, though causal relationships (e.g. about the increase of motivation) have been subjectively observed and reported, but not objectively measured. At the same time, we worked only with a small number of learners (87 in total), which prevent us from the possibility to generalize for the entire university or even less on a global scale.

Besides, not only the size of a sample is here the limitation but a one-sided view, due to the fact that only student's opinion has been taken under consideration. Starting with this, it seems obvious to continue the research by additionally involving at least the perspective of teachers on and about flexible assessment.

Although we intended to apply a mixed method with a pre-dominance of qualitative research in it, in order to explore this previously not much investigated area and describe the peculiarities of flexible assessment as a novel approach in teaching and learning, the completeness of the gained results may be biased by the subjective perception of the interviewees and call therefore for further explicative research by the means of quantitative methods. Also, an experimental design, with a control group, in order for instance to measure the change in performance, might enrich received results. Moreover, a longitude study, in order to get insight of long-term consequences, appears advantageous and is recommendable for further research.

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T4

Ikaskuntzaren eta irakaskuntzaren ikuspegi profesionala irakasleen garapen profesionala garatzeko helburu gisa

The professional approach to teaching and learning as the objective of the professional development of academic staff

El enfoque profesional de la enseñanza y el aprendizaje como objetivo del desarrollo profesional del profesorado

Exploring staff perceptions of first-generation students to enhance professional development of academic staff

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Abstract

Supporting students' transition into higher education is often described as essential to enhance their progression and learning experiences, and their ultimate successful completion of their degree. Yet students from non-traditional backgrounds continue to report considerable difficulties in adapting to university life (Hamshire, Forsyth *et al.,* 2018; Laubscher-Kelly, Paxton *et al.,* 2018). Whilst there is a considerable body of research on students' learning experiences, the perspectives of staff working with these students are rarely recorded. This paper reports on a collaborative project between researchers in the UK and South Africa exploring staff perceptions of first generation students' experiences. Twenty members of staff volunteered to be included in the study at each of the participating institutions, and were invited to reflect on their perceptions and experiences using semi-structured interviews. All interviews were digitally recorded, transcribed verbatim and subsequently analysed using a thematic approach to identify staff perceptions. Despite the very different cultural contexts experienced by these students in the two institutions, the staff reported considerable similarities in the challenges they believe students face in integrating into university life. This session will present findings from the project, with a focus on the role of academic professional development. We will also showcase some of the resources developed for professional development during the project as well as offer reflections on future developments and potential wider implications.

1. Background

In both South Africa and the UK, higher education institutions have experienced a significant shift in student populations. Within South Africa the transformation agenda focuses on the need to redress the historical legacy of an unequal system of access (both physical and epistemic) and participation. Higher education is a key driver of 'equity, social justice and democracy' in the state's vision for 2030 (Commission., 2012). In the UK, there has also been rapid expansion with 48% of 17-30 years olds considered likely to participate in UK higher education (HE Analysis Team, 2016), compared with just 3.4% in 1950 (Bolton, 2012).

Student progression can be lower in UK universities which have more diverse student populations, and South African higher education institutions also face major challenges with student retention, throughput and success. Despite efforts to make higher education equitable to all those who could benefit from it, the retention and success of black and coloured students remains much lower than their white counterparts in South Africa (Council on Higher Education, 2013). And in the UK, our own previous research (Hamshire, Willgoss *et al.,* 2012; Hamshire, Willgoss *et al.,* 2013; Hamshire, Forsyth *et al.,* 2017; Hamshire, Forsyth *et al.,* 2018; Laubscher-Kelly, Paxton *et al.,* 2018) has highlighted that some students

who are first in their family to attend university (often known as 'FIFU' or 'first generation' students) feel that they do not belong at university.

The work of Bourdieu in the 1970s and 1980s (for instance, Bourdieu and Passeron, 1977; Bourdieu, 1984; Bourdieu, 1986) provided a framework for characterising institutional 'habitus' and how it may appear to students who enter higher education without the required cultural capital to benefit from all the perceived advantages of the institution. In an attempt to address this issue, first generation students have often been problematized as the 'others' who need to change to fit in with the prevailing habitus (Burke, 2008; Burke, 2012; Spiegler and Bednarek, 2013; O'Shea, 2016).

Our previous research on the experiences of students who are the first in their family to go to university, has demonstrated that academic staff play a key role in shaping the academic environment —particularly the classroom— and thus are key players in creating spaces where all students feel welcome (Hamshire, Forsyth *et al.,* 2017; Hamshire, Forsyth *et al.,* 2018).

This study sought to explore staff perceptions of first generation students to identify their (staff) perceptions and make proposals for challenging commonly-voiced assumptions about students and university life. These proposals are considered in a broader context of diversity and inclusive practice with the intention of developing appropriate academic professional development opportunities and a portfolio of resources.

2. Methods

This study used a qualitative phenomenological design; data were collected at both institutions using individual semi-structured interviews. The purpose was to explore staff perceptions of first generation students, including the robustness of these perceptions and the origins of some of these perceptions. The interview schedule was structured around four key themes: defining first generation students, how first generation students experienced university life, what support was available for students, and the needs of first generation students. Follow-up questions, where appropriate, were asked to further explore key topics.

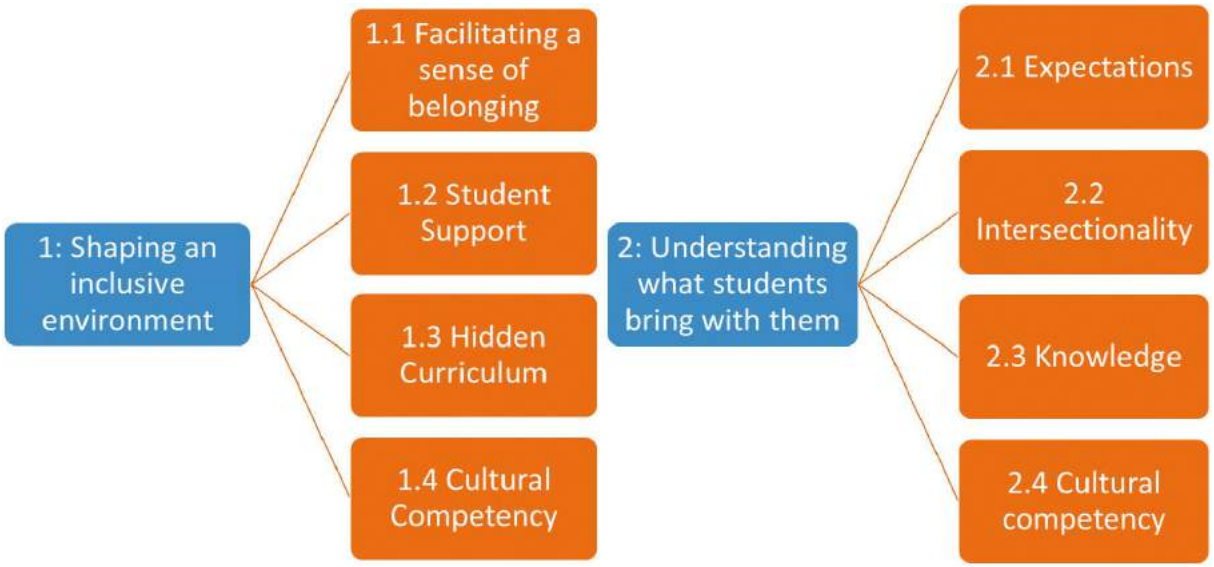
Convenience sampling was used to recruit twenty staff at each of the two institution via internal emails. The staff were from a range of different disciplines across each institution and their job roles ranged from academic staff (Professor), support staff (Student Support Tutor), and management staff (student advisor) The number of years they had worked within higher education was between one and twenty.

This project was approved by both the Manchester Metropolitan University ethics committee (Faculty of Health, Psychology & Social Care) and the University of Cape Town, Centre for Higher Education Development (CHED) ethics committee. Involvement in the project was voluntary.

3. Results

All the interviews were transcribed verbatim and analysed using framework analysis (Ritchie and Spencer, 2002; Spencer, Ritchie *et al.,* 2013). Two global themes were identified, see Figure 1 below:

Figure 1
Themes identified



3.1. Shaping an inclusive environment

An inclusive learning environment needs to foster a sense of belonging for *all* students; understanding inclusivity is vital for this. Within their interviews the South African (SA) staff commented on how difficult it was for students to *'find a way in'* and that students needed to *'be kind to [them]self […] learning to pick out the most important things and let some things go…, find study buddies and find academics that you can talk to who can mentor you, so you can get some help creating that supportive structure'* (SA staff).

These comments were echoed across the interviews of the UK staff:

> 'That first year is awful. It doesn't matter who you are. Do you know what I mean? If you can keep your head above water in the first year. I think it's sometimes harder for people who've got no idea what's meant to happen.'

The importance of belonging was a recurring theme, which is essential for creating an inclusive environment, as noted by one of the SA staff below:

> 'Very often they are unprepared for the emotional and personal challenges, in how they adapt, how they feel they belong in the institution, how they identify their belonging and the experiences of being a university student'.

Across both institutions staff were enthusiastic about facilitating a sense of belonging and providing support for learning. However, participants, on the whole, were not aware of any ways that their university specifically targeted first generation students in terms of support. Participants suggested ways that support for first generation students could be improved by making services accessible, clearer and existing supports more consistent:

> 'The problems I think they'll have is this sort of imposter syndrome and not really understanding how to navigate the whole, complex university system

> and thinking that, well, maybe this place isn't for me or I'm not good enough and, in some ways, it's issues that we're tackling across the university…, trying to make services clearer, trying to be- to make staff more open and approachable for support, trying to help build support networks.' (UK staff)

However, they also identified a hidden curriculum that raises barriers for first generation students:

> 'There is historically among students a sense of institutional culture being unwelcoming, not being inclusive and many students not feeling welcomed … You navigate this whole thing on your own as a first generation student. First in your family, coming here, it's a huge challenge.' (SA staff)

This leads to students feeling isolated from the environment which has a detrimental effect on their academics and mental well-being.

3.2. Understanding what students bring with them

All of the staff noted that whilst first generation students did not have a familial history of higher education they had other personal resources and experiences to facilitate their transition to higher education – such as resilience (as often cited by SA staff in interviews). However, within these comments there was also a deficit discourse that focused on what the students lacked, the difficulties they experienced and that *'expectations are often completely unrealistic and ill-informed'* (SA staff). The UK staff also perceived first generation students as having a class divide, working class values and lacking in cultural capital:

> 'I see the difference in students in terms of the behaviours that they bring in, things- their confidence, their resilience.'
>
> '…because they feel like they're the one person who doesn't really deserve to be there and everyone is smarter than them and I think that that's probably how first-generation students feel – that university isn't for them because, you know, they're surrounded by what- probably more middle-class kids who- from different backgrounds.'

The pressure and expectation from family was noted as being both a positive and negative experience for students:

> 'I think sometimes that expectation that there is from the family that you are the first person to go to university, maybe it creates a push for extra motivation for staying.' (UK staff)
>
> 'If you are the first there is a lot more pressure on you and more is expected of you, and that also impacts on how successful you will be … it is a steep climb for people.' (SA staff)

In the South African context, the notion of 'Black tax' (implies 'giving back' or 'paying back' the family/community) was highlighted as an extreme pressure on first generation students.

It's difficult that there is a burden to shoulder to help the family. My dad did the same helping his brothers and cousins. But there is something about the expectation that you need to help, 'black tax'

'I am aware of students that I know come from backgrounds where money might be an issue and they are having to work quite hard. I do have a number of students who work far too many hours in terms of the impact that has on them completing their degree and that is really problematic.' (UK staff)

4. Reflections

Students' individual expectations can have a profound impact upon their learning experiences (Ecclestone, Field *et al.*, 2010) and new students usually need time to adapt to the culture of higher education (Wilcox, Winn *et al.*, 2005). Students' personal and academic development is a continuous process throughout their studies, and is influenced by a wide range of social, academic and personal factors (Hamshire, Willgoss *et al.*, 2013). Whilst universities cannot offer bespoke support to each individual student, we need to shift the focus on to how teaching and support staff can scaffold student success and value what first generation students may bring to their programmes, peers and tutors.

All of the staff at both institutions who participated in this research were strongly committed to providing an inclusive environment for first generation students; however, overall, across the dataset, there was a tendency for staff to generalise and make assumptions about students' previous experiences without detailed understanding of students' circumstances. In essence, they sometimes undervalued the skills and knowledge the students brought with them and instead focused on what the students did not have.

There was a remarkable consistency in staff views between the two countries; perhaps this is not surprising in that both universities have a traditional model of higher education, but there are many differences in the educational contexts from which their students come. One striking similarity is the expectation of staff that the first year would be not only challenging, but that institutional culture is 'unwelcoming'. Despite staff commitment to the success of first-generation students, they seemed unable to visualise their own place in actions to make it happen. In South Africa, the student protests of 2015-16 (Rhodes Must Fall) brought to the surface the feeling some students experience of being unwelcome in the university.

In an era of high participation in higher education, most universities are very aware of the challenges of transitioning from compulsory schooling and the need to provide a wide range of resources and support for students. It is also fair to say that staff members are committed to creating an inclusive environment in their classrooms. The relative disconnect between staff knowledge of these schemes and the relevance of such support to students' ability to engage with the curriculum and with their peers and tutors was a striking feature of our interviews. As an outcome of this project the team began to consider how they could provide staff with some agency in changing this situation.

Using the rich data collected in the interviews, and previous work reporting students' views, a set of staff development materials was created. The purpose of these was to provide opportunities for staff to explore their individual responsibilities in creating an inclusive environment in which the second of our themes, understanding what first generation students bring, could be seen as a positive contribution to university life.

These resources are being piloted in a range of workshop situations. It can be difficult to judge the impact of such staff development, as it is likely to be one factor in a range of cultural change activities, but the team will be evaluating changes in staff perceptions in relation to the key themes identified in this research.

5. Summary

This research has focused on a particular group of students, those who are the first in their family to enter higher education at two universities, one in the UK and one in South Africa. It reflects work on other groups of students described as 'non-traditional'. The main conclusion is that a diverse student population comes to university with wide-ranging educational experiences that may not be easily identified or supported by staff. By providing academic professional development opportunities for staff to gain awareness of the range of different experiences that students bring to higher education, staff may be empowered to work more actively with students to enrich the curriculum and to make their transition into university a positive experience. In this process, both staff and students need to be open with each other about expectations and challenges.

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La création personnelle d'un objet d'apprentissage « aimé » par l'étudiant : un facteur pour stimuler l'engagement ?

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Abstract

The problem concerns marketing learning in the context of business studies in higher education. It is a central subject for which students declare themselves highly motivated. However, the authors note that this declaration does not necessarily generate engagement. (De Ketele, 2016). Students are also consumers and they think they know this discipline but they don't act enough "to meet the requirements and expectations of training.»

The pedagogical system created by the authors to stimulate engagement consists in asking each student —as part of an active pedagogy— to self-determine his learning object by instructing him to choose a product related to his personal interests (De Ketele 2016, Viau quoted by Amadieu, 2016).

A survey consisting of 14 closed multiple-choice questions has been proposed. Each of student out of a total of 134 has completed an anonymous questionnaire to verify the effectiveness of this pedagogical approach. The results show that 80.60% of the respondents agree or strongly agree with the sentence «imagining my own product helps me to understand the theoretical concepts» and that 79.85% of them agree or strongly agree with the sentence «liking my own product helps me to understand the theoretical concepts". These observations may suggest that the personal creation of a learning object «liked» by the student induces an emotional anchoring and stimulates his engagement to succeed in his learning and consolidate the authors in their choice of teaching.

However, only 36% of learners say they feel comfortable during the teaching activity

As a result, the authors propose to complete their practice by consolidating the support system with a formalized personal progress report card to improve the feeling of personal effectiveness in relation to the student's cognitive and behavioral engagement (De Ketele, 2016).

Resume

La problématique abordée porte sur l'apprentissage du marketing dans le cadre d'études commerciales dans l'enseignement supérieur. Il s'agit d'une matière centrale pour laquelle les étudiants se déclarent très motivés. Pour autant, les auteures constatent que cette déclaration n'engendre pas nécessairement un comportement d'engagement (De Ketele, 2016). Parce qu'ils sont également consommateurs, les étudiants pensent en effet connaître cette discipline et à ce titre ne « mettent pas en place les actions nécessaires pour répondre aux exigences et attentes de la formation ».

Le dispositif pédagogique mis en place par les auteures pour stimuler l'engagement consiste à demander à chaque étudiant — dans le cadre d'une pédagogie active — d'autodéterminer son objet d'apprentissage en lui donnant pour consigne de choisir un produit en lien avec ses intérêts personnels (De Ketele 2016, Viau cité par Amadieu, 2016).

Une enquête composée de 14 questions fermées à choix multiples a été conduite auprès de toute la promotion concernée (134 étudiants) pour vérifier l'efficacité de ce dispositif. Les résultats montrent notamment que 80,60% des répondants sont d'accord ou tout à fait d'accord avec la phrase « le fait d'imaginer mon propre produit m'aide à comprendre les concepts théoriques » et que 79,85% d'entre eux sont d'accord ou tout à fait d'accord avec la phrase « le fait d'aimer mon propre produit m'aide à comprendre les concepts théoriques. Ces observations peuvent laisser penser que la création personnelle d'un objet d'apprentissage « aimé » par l'étudiant provoque un ancrage émotionnel et stimule son engagement pour qu'il parvienne à réussir son apprentissage et confortent les auteurs dans leur choix d'enseignement.

Cependant, seuls 36% des apprenants déclarent se sentir à l'aise pendant l'activité pédagogique. En conséquence, les auteures se proposent de compléter leur pratique en renforçant le disposi-

tif d'accompagnement par une fiche individuelle formalisée de suivi de progression pour améliorer le sentiment d'efficacité personnelle en lien avec l'engagement cognitif et comportemental de l'étudiant (De Ketele, 2016).

1. Stimuler l'engagement: comment et pourquoi ? Exemple dans l'enseignement du marketing fondamental

La problématique abordée porte sur l'apprentissage du marketing dans le cadre d'études commerciales dans l'enseignement supérieur. Il s'agit d'une matière centrale pour laquelle les étudiants se déclarent très motivés. Pour autant, nous avons constaté que cette déclaration n'engendre pas nécessairement un comportement d'engagement (De Ketele, 2016).

Dans un premier temps, nous contextualiserons nos pratiques et présenterons les principales modalités mises en œuvre pour stimuler la motivation des apprenants.

Dans un second temps, les principaux résultats d'une enquête quantitative menée auprès d'étudiants seront analysés afin de vérifier l'efficacité du dispositif présenté et de proposer de nouvelles pistes de réflexion.

1.1. Problematique

Dans le cadre de nos expériences d'enseignement, nous avons pu opérer deux principaux constats pouvant être à l'origine du défaut d'engagement constaté.

Le premier a trait à l'accès aux connaissances. Pourquoi l'étudiant s'intéresserait-il au cours puisqu'il trouve « à peu près tout sur le web » ? Il s'agit donc de le motiver pour découvrir des savoirs et se les approprier (Bouillier, 2015).

Le second est lié à la nature de la discipline enseignée. Parce qu'ils sont également consommateurs, les étudiants pensent en effet connaître cette matière et à ce titre ne « mettent pas en place les actions nécessaires pour répondre aux exigences et attentes de la formation » (Boulocher, 2000).

Dans ce contexte, il est apparu indispensable de créer des situations d'apprentissage stimulantes. En effet, la motivation, source de persévérance dans le travail scolaire, est aujourd'hui une caractéristique d'apprentissage qui diminue au fil des années d'études (Viau, 2009). Une étude récente (Paivandi, 2015) menée sur la « relation à apprendre » des étudiants français relève que près d'un étudiant sur deux adopte une posture de moindre mobilisation intellectuelle car il se situe dans une perspective d'apprentissage soit de type « minimaliste » (34%) et se « contente consciemment d'un minimum indispensable pour valider ses cours » soit de « désimplication » (11%).

Il s'agissait donc de concevoir un dispositif pédagogique pour stimuler l'engagement de chaque apprenant. Nous avons choisi de retenir une pédagogie par **situation authentique** (Duval et Pagé, 2013) qui conduit à mettre en place un contexte d'apprentissage réaliste. La situation authentique imaginée consiste à demander à chaque étudiant — dans le cadre d'une pédagogie active — d'auto déterminer son objet d'apprentissage en lui donnant pour consigne de choisir un produit en lien avec ses intérêts personnels (De Ketele 2016, Viau cité par Amadieu, 2016).

Dans le cas de notre enseignement du marketing, l'apprenant doit choisir un objet d'apprentissage personnel et individuel dans la perspective de réaliser les analyses

nécessaires au lancement commercial d'un nouveau produit et de prendre les décisions le concernant. Il s'agit pour nous d'encourager les étudiants à choisir un produit qui correspond à leurs centres d'intérêts personnels de façon à renforcer l'ancrage émotionnel et ainsi stimuler la motivation. Ce choix personnel et individuel de l'objet d'apprentissage s'inscrit dans la démarche d'une méthode pédagogique que nous avons développée, la méthode dite du P.F.R. (Produit Fil Rouge), méthode qui propose aux étudiants de concevoir (être acteur) la stratégie marketing d'un produit qu'ils ont choisi en utilisant les connaissances théoriques mises à leur disposition en ligne (classe inversée) et l'aide présentielle ou virtuelle de l'enseignante ou des autres étudiants (dimension relationnelle de l'approche) (Chérel, Madrid, 2016).

Notre postulat de départ repose sur le fait qu'en choisissant son objet d'apprentissage l'étudiant est amené à s'engager dans le processus d'acquisition d'apprentissages en faisant naître le plus souvent une source de motivation intrinsèque.

Au-delà de proposer à l'apprenant de choisir son propre objet d'apprentissage, nous souhaitions que chacun puisse **progresser à son rythme** dans l'acquisition des apprentissages de façon à le rendre **acteur de son cheminement**. Il nous semblait important de donner à chacun la maîtrise de son évolution pour ne pas l'enfermer dans un cadre temporel strict et trop contraignant qui peut engendrer une certaine démotivation, une diminution de l'engagement. Rendre l'apprenant acteur de son parcours l'aide à développer un sentiment de maîtrise et renforce l'attachement au projet. Jezegou, (2013) explique également que selon la théorie de l'autodétermination, lorsque les étudiants sont autorisés à s'approprier leur processus d'apprentissage, cela augmente leur motivation. Nous avons alors considéré que travailler sur l'ancrage émotionnel de l'étudiant à son objet d'apprentissage renforcerait sa motivation, son engagement.

De plus, Young (2005) a montré qu'une expérience active axée sur les applications, qui fournit une interaction élevée, augmente la motivation intrinsèque. La méthode du PFR nous a permis de proposer aux étudiants des activités de rétroactions diverses nourrissant l'interaction entre pairs ou avec les enseignantes. L'objectif est encore ici de renforcer la motivation pour conduire chaque apprenant vers la réussite. De façon à renforcer le dispositif initial, il a été proposé aux étudiants sur le semestre 2 de l'année universitaire, de les laisser agir de façon encore plus autonome pour que chacun chemine à son rythme. Ainsi chaque étudiant décide du moment où il estime être prêt à se soumettre au processus de validation des connaissances. Pour autant pour le guider sans le contraindre, nous avons conçu un dispositif qui sera détaillé dans la deuxième partie.

1.2. Une enquete aupres des etudiants pour valider les postulats de départ

A l'occasion de l'année universitaire en cours, la méthode PFR a été labellisée PARI (Passeport pour l'Université, Accrochage, Raccrochage, Insertion professionnelle). Il s'agit d'un dispositif porté par l'IUT de Bordeaux et co-financé par le Fond Social Européen sur une durée de 3 ans. Ses objectifs sont multiples et il vise notamment, à permettre aux bénéficiaires :

— « De mieux **mobiliser les jeunes étudiants recrutés en IUT** dès le début de leur formation par des études de cas / jeux d'entreprise / situations-problèmes révélatrices des concepts, de la méthodologie de travail et des moyens de mise en œuvre de la technologie dans des **situations professionnelles authentiques ».**

— « De mieux approfondir les **enseignements** reçus pour se perfectionner. Un moyen efficace de préparer son Insertion, de mettre à l'épreuve et de démontrer **ses compétences professionnelles… ».**

Dans ce cadre, tous les dispositifs labellisés sont soumis à une enquête administrée en ligne de façon anonyme. Une enquête composée de 14 questions fermées à choix multiples a été conduite en fin de semestre (décembre 2018) auprès de toute la promotion concernée (134 étudiants en semestre 1 de formation initiale) pour vérifier l'efficacité du dispositif décrit précédemment. Les résultats qui vont être commentés ici sont extraits d'une part des éléments du volet pédagogique spécifique liés à notre pédagogie et d'autre part du volet général du questionnaire PARI, conçu quant à lui par les équipes de recherche en sociologie et psychologie du projet.

2. Principaux resultats: une nécessaire contextualisation de l'ancrage emotionnel

2.1. La motivation amelioree

Les résultats (figures 1 et 2) montrent notamment que 79,85% (107/134) des répondants sont d'accord ou tout à fait d'accord avec la phrase « le fait d'*imaginer* mon propre produit m'aide à comprendre les concepts théoriques » et que 79,1% (106/134) d'entre eux sont d'accord ou tout à fait d'accord avec la phrase « le fait d'*aimer* mon propre produit m'aide à comprendre les concepts théoriques". Ces observations permettent de penser que la création personnelle d'un objet d'apprentissage « aimé » par l'étudiant provoque un ancrage émotionnel et stimule son engagement et confortent les auteures dans leur choix d'enseignement.

Figure 1

Avis des apprenants sur le fait d'imaginer leur objet d'apprentissage

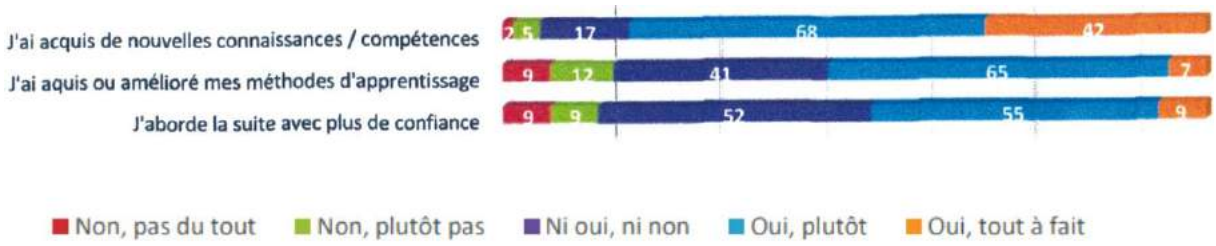
Figure 2

Avis des apprenants sur le fait d'aimer leur objet d'apprentissage

En ce qui concerne la projection personnelle des apprenants pour la suite du parcours (figure 3), on constate également que 82% (110/134) des répondants déclarent avoir acquis de nouvelles connaissances/compétences, 53% (72/134) avoir acquis ou amélioré leur méthode d'apprentissage et 47,7% (64/134) aborder la suite avec plus de confiance.

Figure 3

Avis des apprenants à propos de l'évolution de leur parcours



2.2. Un ancrage emotionnel certain

Nous avons cherché à préciser ces observations en fonction du lien entre l'objet d'apprentissage choisi par les apprenants et leurs centres d'intérêts personnels. En effet lorsque nous présentons notre démarche pédagogique en début de semestre, nous leur donnons comme consigne d'imaginer un produit en lien avec un domaine qui les intéresse. Toutefois, comme le montrent les résultats ci-dessous, leur choix effectif s'avère guidé par d'autres raisons pour 27% d'entre eux (figure 4).

Figure 4

Modalités de choix des apprenants pour leur objet d'apprentissage

Nous avons donc cherché à recouper la nature de l'objet d'apprentissage, en lien ou pas avec les centres d'intérêt personnels de l'apprenant, et les caractéristiques de son apprentissage. Les observations diffèrent selon que l'on considère l'apprentissage du point de vue d'un état émotionnel ou de sa performance.

2.2.1. *Du point de vue de l'état émotionnel lié à l'apprentissage*

Comme le montrent les tableaux ci-dessous, le choix d'un objet d'apprentissage proche des centres d'intérêts personnels de l'apprenant favorise le sentiment de motivation en début d'activité, réduit le sentiment d'anxiété et renforce le sentiment de confiance pour la suite du parcours.

En effet, parmi les apprenants qui ont choisi d'imaginer un produit proche de leurs centres d'intérêt 84% (83/98) sont d'accord avec le fait qu'aimer ce produit les motive alors qu'ils sont seulement 63,8% (23/36) quand le choix du produit en est éloigné (tableau 1).

Tableau 1
Le choix du produit et le sentiment de motivation au début de l'activité pédagogique[1]

Le fait d'aimer me motive / modalités de choix du produit	Tout à fait d'accord et d'accord	Pas d'accord et pas du tout d'accord	Total
Choix du produit hors centres d'intérêt	23	13	36
Choix du produit en lien avec centres d'intérêt	83	15	98
Total	106	28	134

Parmi ceux qui ont choisi d'imaginer un produit proche de leurs centres d'intérêt 26.5% (26/98) déclarent se sentir être à l'aise. Dans le cas contraire on constate que seuls 9% (3/33) déclarent la même chose (tableau 2). Ils sont également 84% (53/63) à signaler aborder la suite avec plus de confiance versus seulement 57% (11/19) (tableau 3).

Tableau 2
Le choix du produit et le sentiment d'anxiété[2]

Sentiment d'anxiété / modalités de choix du produit	Durant cette activité je me suis senti(e) à l'aise	Durant cette activité je me suis senti(e) nerveux(se), anxieux(se)	Total
Choix du produit hors centres d'intérêt	3	33	36
Choix du produit en lien avec centres d'intérêt	26	72	98
Total	29	105	134

[1] *Khi 2:* 6.8945264988295, p-value : 0.0086460060691759
[2] *Khi 2:* 5.1411346804732, p-value : 0.023365371890708

Tableau 3

Le choix du produit et le sentiment de confiance pour la suite[3]

J'aborde la suite de la formation ou les prochaines activités avec plus de confiance / modalité de choix du produit	Pas d'accord et pas du tout d'accord	Tout à fait d'accord et d'accord	Total
Choix du produit en lien avec centres d'intérêt	10	53	63
Choix du produit hors centres d'intérêt	8	11	19
Total	18	64	82

2.2.2. *Du point de vue de la performance de l'apprentissage*

En revanche, nous n'observons pas de liaisons statistiquement significatives entre le choix d'un objet d'apprentissage proche des centres d'intérêts personnels de l'apprenant et l'acquisition de nouvelles compétences, le sentiment de « maîtriser pour la première fois quelque chose qui constituait une difficulté », « d'avoir progressé » et « l'amélioration de méthodes personnelles d'apprentissage (tableaux 4 5, 6 et 7).

Néanmoins, nous constatons un score très satisfaisant soit 94.01% (110/117) de déclaration d'acquisition de nouvelles compétences (tableau 4), de sentiment d'avoir progressé soit 84.35% (97/115, tableau 5) et de « maîtriser pour la première fois quelque chose qui constituait une difficulté » 58.33% (42/72 tableau 6). 77.42% (72/93 interrogés (tableau 7) déclarent également avoir acquis ou améliorer leurs méthodes personnelles d'apprentissage.

Tableau 4

Le choix du produit et l'acquisition de nouvelles compétences[4]

Acquisition de nouvelles compétences	Choix du produit en lien avec centres d'intérêt	Choix du produit hors Centres d'intérêt	Total
Pas d'accord et pas du tout d'accord	5	2	7
Tout à fait d'accord et d'accord	83	27	110
Total	88	29	117

Tableau 5

Le choix du produit et le sentiment de progression[5]

Sentiment d'avoir progressé / modalités de choix du produit	Pas d'accord et pas du tout d'accord	Tout à fait d'accord et d'accord	Total
Choix du produit hors centres intérêt	7	26	33
Choix du produit en lien avec centres d'intérêt	11	71	82
Total	18	97	115

[3] *Khi 2*: 5.8630894365543, p-value : 0.015461631799126

[4] *Khi 2*: 0.057218682571347, p-value: 0.81094719213367. Variables statistiquement indépendantes car car p > 5%

[5] *Khi 2*: 1.0836542018966, p-value : 0.29788152203461. Variables statistiquement indépendantes car car p > 5%.

Tableau 6

Le choix du produit et le sentiment de « maîtriser pour la première fois à quelque chose qui constituait une difficulté pour mo »"[6]

Modalités de choix du produit / sentiment de maîtriser pour la première fois une difficulté	Choix du produit hors centres d'intérêt	Choix du produit en lien avec centres d'intérêt	Total
Tout à fait d'accord et d'accord	10	32	42
Pas d'accord et pas du tout d'accord	9	21	30
Total	19	53	72

Tableau 7

Le choix du produit et l'acquisition et l'amélioration de méthodes personnelles d'apprentissage[7]

Modalités de choix du produit / acquisition et amélioration de méthodes personnelles d'apprentissage	Choix du produit en lien avec centres d'intérêt	Choix du produit hors centres d'intérêts	Total
Pas d'accord et pas du tout d'accord	15	5	21
Tout à fait d'accord et d'accord	57	15	72
Total	72	21	93

Par ailleurs, le fait d'imaginer un produit aide à comprendre les concepts théoriques (80.5%) et à les retenir (77%) (Figure 5).

Figure 5

Avis des apprenants sur l'aide apportée par le fait d'imaginer leur objet d'apprentissage sur leur apprentissage

[6] *Khi 2*: 0.34524045963967, p-value : 0.55681983566739. Variables statistiquement indépendantes car car p > 5%.

[7] *Khi 2:* 0.15972222222222, p-value : 0.68941238879948. Variables statistiquement indépendantes car car p > 5%.

En somme l'efficacité de la méthode en termes d'apprentissage n'est pas à remettre en question. Toutefois, l'ancrage émotionnel que nous avons relevé précédemment comme levier de motivation n'apparaît pas comme un facteur significatif de réussite de cet apprentissage. Nous pensons que c'est la mise en situation authentique qui joue à ce niveau le rôle le plus important. Le lien émotionnel avec l'objet d'apprentissage quant à lui semble agir plutôt sur l'état psychologique de l'apprenant.

2.3. Des pistes d'amelioration de nos pratiques

En ce qui concerne l'état psychologique des apprenants, nous constatons qu'aucun ne se déclare en difficulté, contrairement à ce qui est généralement observé dans l'ensemble des activités pédagogiques (figure 6b). Toutefois, même si nous avons observé que le choix du produit contribue à réduire le sentiment d'anxiété, seuls 36% des apprenants déclarent se sentir à l'aise pendant l'activité pédagogique soit 73% anxieux ou nerveux. Cela nous paraît compréhensible car l'activité proposée requiert des compétences très différentes de celles pour lesquelles ils ont été formés dans leur précédente scolarité au lycée. Ce score s'avère toutefois assez faible au regard de la moyenne des réponses pour l'ensemble des activités pédagogiques (56%, figure 6b)

Fig. 6a
Etat psychologique des apprenants pendant l'activité

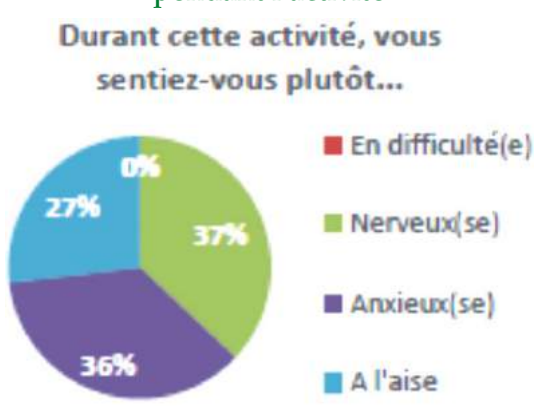
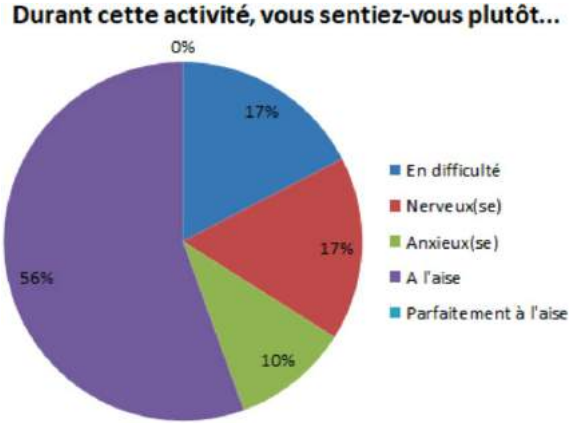


Fig. 6b
État psychologique des apprenants pour l'ensemble des activités évaluées



C'est pourquoi nous avons mis en place au début du second semestre (février 2019) un dispositif d'accompagnement plus individualisé afin de les rassurer et d'améliorer le sentiment d'efficacité personnelle en lien avec l'engagement cognitif et comportemental de l'étudiant (De Ketele, 2016). Nous avons créé une fiche individuelle formalisée de suivi de progression Cette fiche a progressivement été remplacée par un dispositif numérique : le logiciel SACoche.

Nous utilisons cet outil pour formaliser les rétroactions en validant les acquis d'apprentissage au fur et à mesure du cheminement des différents apprenants. Des remarques constructives peuvent ainsi être formulées au juste moment et à propos de l'aspect conceptuel précis auquel ils s'intéressent.

Cette validation déclenche la possibilité de préparer les vidéos de cours requises pour passer à l'étape ultérieure. Ce type de rétroaction est très apprécié par les apprenants qui y voient un guide précis de leur progression, ce qui les rassure. Globalement, l'ensemble se rapproche du « Dispositif ouvert centré apprentissage soutenu par un environnement riche et varié » décrit par Burton *et al.* (2011).

Nous avons tout d'abord testé ce suivi individualisé à petite échelle. Le tableau ci-dessous présente un exemple de parcours individuel pour une classe d'apprenants pour lequel il précise également l'obtention ou non de la compétence lors du livrable final.

Tableau 8
Exemple de parcours individuel d'acquisition de compétences

	Identifier les marchés de références	Identifier les clients de la profession, les NCR et NCA	Quantifier la demande théorique	Identifier les forces concurrentielles en cohérence avec les marchés de référence	Caractériser l'intensité des forces concurrentielles	Lier l'environnement concurrentiel aux forces	validation compétences livrable final
[illegible]							non
[illegible]							non
[illegible]							non
[illegible]							oui
[illegible]							non
[illegible]							oui
[illegible]							non
[illegible]							non
[illegible]							non
[illegible]							non
[illegible]							oui
[illegible]							non
[illegible]							oui
[illegible]							oui
[illegible]							oui
[illegible]							non
[illegible]							non
[illegible]							non

Il est souhaitable que toutes les compétences soient acquises à la fin de la période d'animation en présentiel et à la date butoir de remise du livrable final. Cependant, tous les apprenants ne progressent pas au même rythme, comme le montrent dans cet exemple les différences dans les parcours d'acquisition de compétences.

Par ailleurs, la non finalisation du parcours n'est pas toujours synonyme de mauvaise évaluation finale, en particulier pour les apprenants qui apprécient le travail en autonomie et qui savent faire preuve d'une « auto organisation » de leur parcours d'apprentissage (cas en rose). Dans certains cas (en rouge), l'apprenant a validé l'ensemble des compétences partielles tout au long de son parcours mais n'a probablement pas su exprimer son savoir-faire pour obtenir la validation finale.

Ainsi, le dispositif pédagogique décrit dans cette communication a pour objectif de stimuler l'engagement des étudiants dans l'apprentissage du marketing dans le cadre d'études commerciales.

Les conclusions d'une enquête menée auprès de ces étudiants montrent que la création personnelle d'un objet d'apprentissage « aimé » par l'étudiant provoque un ancrage émotionnel et stimule son engagement. Nous rejoignons ainsi les travaux de Mälkki et Green (2018) qui ont étudié les dimensions émotionnelles et sociales de l'apprentissage transformateur et expliquent comment la cognition et les émotions sont étroitement liées dans les processus de réflexion. Cet ancrage émotionnel n'agit toutefois pas sur la performance de l'apprentissage. Les résultats ont également suggéré de renforcer le dispositif d'accompagnement par une fiche individuelle formalisée de suivi de progression. Nous venons de la mettre en place à grande échelle (promotion de 140 étudiants). Nous serons en mesure de présenter un retour plus complet lors de la communication orale. D'ores et déjà nous constatons que la mise en place de ce suivi individuel formalisé met l'accent sur les écarts de progression de manière plus explicite : nous sommes ainsi confrontées à la difficulté de concilier notre volonté de les accompagner vers la réussite et notre volonté de respecter leur rythme.

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Supporting teachers in doing SoTL: Development and effect of an interdisciplinary course at Utrecht University

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Abstract

Establishing and sustaining a culture of Scholarship of Teaching and Learning (SoTL) as part of a professional approach to teaching and learning offers many challenges. Careful introduction of SoTL is needed with many aspects to be considered such as the development of support structures like pedagogical courses.

Recently Educational Scholarship, including SoTL, became one of the cornerstones of the new Utrecht Centre for Academic Teaching (CAT) of the Utrecht University (UU), the Netherlands, with the aim to make SoTL part of the learning culture of the UU. UU is therefore at the starting point of integrating SoTL as part of the professional development of academic staff. Based on our experiences with two explorative pilot courses for teachers, literature research and a theoretical framework, a new pedagogical course for science teachers that want to get engaged in SoTL was developed. A community-based approach, with plenty of room for peer-discussion and feedback, was chosen to make it able for participants to share their projects and to collaborate. Other main principles for the development of the course were mentoring by experts, relevant workshops, guided discussions, financial support, dedicated time for the participants, and the encouragement of participants to work together on (shared) projects in theme groups. The course is aimed at teachers from the faculty of Science and was given from October 2018 until September 2019.

In this study the theoretical framework of the design of the course will be illustrated. The first results of a mid-term evaluation show that the participants appreciate being part of a community with plenty of opportunity for peer discussion, reflection and structured support for their SoTL-project. It is expected that most of the participants will successfully finish the course by executing a SoTL-project and sharing the results.

The final study contributes to the quality of teaching and student learning, and the academic development of teachers, by formulating design principles for SoTL-courses. In addition, success- and failure factors of SoTL-courses and support programmes will be identified.

1. Introduction

There is a general agreement that the aim of SoTL is to improve the quality of teaching and learning. Research has shown that there is a relation between teachers' involvement in SoTL and students' learning, course experiences and satisfaction[1,2]. Furthermore, engagement of academic teachers with SoTL stimulates them to try new teaching methods, often aimed at more active roles for students. Teachers involved in SoTL also more actively seek for evidence for the learning of their students and read more systematically in the literature on learning in their own field[3]. Teachers thus use the principles of SoTL to engage in reflective practice to improve the learning of their students and their own roles as teachers. Establishing a culture of SoTL can therefore not only been seen as a way to improve teaching and learning but also as a powerful form of academic development of teachers. However, establishing and sustaining a culture of SoTL as part of a professional approach to the

academic development of teachers, offers many challenges[4]. Careful introduction of SoTL, and, amongst others, providing support structures like pedagogical courses, is therefore needed.

Recently Educational Scholarship, including SoTL, became one of the cornerstones of the new Utrecht Centre for Academic Teaching (CAT) of the Utrecht University (UU), the Netherlands ,with the aim to make SoTL part of the learning culture of the UU. UU is therefore now at the starting point of integrating SoTL as a form of professional development of academic staff. As part of this aspiration, and based on our experiences with two explorative pilot courses for teachers[5], a new pedagogical course for academic science teachers that want to get engaged in SoTL was developed.

2. Theoretical Framework of the Course

To design a pedagogical course to support engagement of teachers with SoTL, the ideas and theories of adult learning have been used as a theoretical framework to formulate the design principles of the course. An important theory for adult education is the andragogy theory of Knowles (2005), that states that when adults mature, they: (a) move from dependency to increasing self-directedness; (b) draw from experiences and prior knowledge; (c) learn when there is a need to know; (d) want to apply their learning immediately; (e) are problem centred; and (f) have an internal motivation[6]. Related to the increasing self-directedness mentioned in this andragogy theory, the theory of self-directed learning is also applicable for adult learning. Self-directed learning is a process were the learner must have authentic control and take own initiative over the form, content, planning, carrying out and evaluating of their own learning experiences[7]. In addition, the theories of experiential learning emphasize the importance of taking into account previous and current experiences of the learner, helping the learner to connect what they have learned from these experiences, and apply what they have learned in practice[8]. Finally, a useful theory for adult education is that of transformational learning, which is the process were learners question their values and believes and change the way they think about themselves and their world. This is often encouraged by reflection and (peer)discussions about assumptions[9]. Several of these theoretical models are clearly recognizable in the six adult learning principles formulated by Lawler and King (2000): create a climate of respect, encourage active participation, build on experience, employ collaborative inquiry, learn for action and empowerment of the participants[9].

These theories and principles of adult learning formed the basis of the design principles of the course. In addition, Hubball *et al.* (2010) have shown that teachers, especially those unfamiliar with social science methodology, often experience significant challenges with performing SoTL, and that mentoring and support by (a community of) SoTL researchers, has a positive influence on the outcome of SoTL-projects[10]. An extensive review on faculty development confirms the relevance of the described theories and principles, but also emphasizes the importance of a longitudinal program design, and institutional support[11].

Taken the above-mentioned insights into adult learning into account while adding our own experiences with two explorative pilot courses for teachers[5], we have concluded that the design of a new course should be a combination of the six adult learning strategies, a community, for sharing experiences and building a network, both group and individual guidance, and support by experienced SoTL facilitators. In addition, institutional support by providing dedicated time and finance for participating in the course and getting engaged in SoTL seems an important factor for success.

2.1. Design principles

1. Build on the current pedagogical and content knowledge of the participants.
2. Stimulate participants to work on a SoTL-project that focusses on a teaching experience or problem in their own classroom.
3. Create a learning community and stimulate collaborative inquiry and reflection by providing opportunities for (peer)discussion, (peer)support, collaboration, and social ('pizza') moments.
4. Empower participants by stimulating them to reflect and take action on their own learning.
5. Create a supportive environment were experimentation and application of the obtained knowledge can take place.
6. Create possibilities for (individual) support, feedback and evaluation of the participants by skilled practitioners.
7. Give participants autonomy and freedom in organizing and planning their own project and making their own choices.
8. Use a longitudinal design of the course.
9. Stimulate active participation during the meetings.
10. (If possible) Provide (institutional) support like time or a (small) grant.

3. Design of the Interdisciplinary Course

The main aim of the design the course is stimulating the professional development of teachers by engaging them in SoTL. During the course the participants will get acquainted with the principles of good practice in SoTL by executing a SoTL project which is inquiry focused on student learning, grounded in context, methodologically sound and appropriately public[12].

The interdisciplinary course is designed for teachers of the Faculty of Science at UU. At UU every academic year has four semesters of ten weeks each, with the first semester starting in September. The course is planned in such a manner that participants are introduced to the principles of SoTL and work out a plan for their SoTL-project during the first two semesters of the Academic Year 2018-2019 (principle 7,8). For this first parts of the course five meetings of three hours each are scheduled. In semester 3 and 4 the participants execute their SoTL-project, collect and analyse data, and evaluate the results. During this period four three hour meetings are scheduled. In September 2019 a last meeting will be planned were the participants can share their results with each other, but preferably also with other interested people (principle 2). The detailed content of the meetings is designed and facilitated by five skilled practitioners, who are also involved in the individual mentoring of the participants.

For the shaping of the content of the course, and to support the participants with the planning of their project (procedural information), the Utrecht Roadmap of Teaching Innovation and Scholarship was developed (principle 2,4). This roadmap shows in a very systematic manner the different steps that the participants have to take to design and execute their own SoTL-project. The unique aspect of the roadmap is that it combines the principles of SoTL with an instructional design model, the so-called 'CIMO' logic method[13]. The roadmap contains SoTL principles such as formulating a research question, designing a study, collecting, analysing, and evaluating data and going public[14]. The 'CIMO' logic method adds to this a very specific and conscious focus on 1) the Context (C) of the teaching

activity, the actual environment the teacher is working in. 2) The Intervention (I), the teaching activity itself. What is the participant really doing in the classroom to improve the learning of the students? 3) The Mechanism (M), the learning of the student that is actually triggered by the intervention, the teaching activity. To answer this question the participant has to search for literature about student learning. The mechanism part of the method therefore guides and stimulates literature research about the learning of students (in the discipline). And 4) The Outcome (O), which is what the participant would like to achieve with the teaching activities. The uniqueness of the combination of SoTL with the 'CIMO' logic model is that it will encourage teachers to think more deeply about their SoTL-project and what they want to achieve with the learning of their students. The roadmap was used to procedurally structure the meetings and to help the participants to design their project. It provided them with a work-in-progress schedule for their SoTL-activities (principle 5,7).

To create a community and to stimulate (peer)discussion and support plenty of time was reserved for group discussion (principle 3,4,5,6). By discussing their own projects with peers, the participants are stimulated to reflect on their own projects and take action to adjust or improve their project plan. Active participation during the meetings was also encouraged by limiting the amount of time for presentations by the facilitators and emphasise the use of interactive workshops related to specific topics (principle 9). Collaboration between the participants was further encouraged by dividing the group of participants in theme groups with the same project theme. During the meetings of the course often the group discussions were held in these theme groups. In this way, participants get to know each other's projects more into detail and can also share experiences and materials, such as questionnaires or other data collection methods. The theme group discussions were all supervised by an experienced facilitator. Presentations of their projects to the whole group gives the participants the opportunity to get feedback from the other participants of the course. Besides the course meetings, the participants could, on their own initiative, make three appointments with one of the facilitators to get individual feedback about their SoTL-project (principle 6). Lastly, to stimulate the community feeling further, in every course meeting time was reserved for 'social-pizza' and talking to the other participants freely (principle 3). Table 1 shows contents of the meetings in more detail.

Besides the meetings, the book 'The Scholarship of Teaching and Learning. A guide for scientists, engineers, and mathematician' was given to the participants[17]. To prepare for the meetings the participants were asked to read the relevant chapter(s) of the book (principle 1). A digital environment (Blackboard) was used to provide other information in the form of invitations to the meetings, (preparation) assignments for the meetings (principle 1), background literature, and for sharing each other's projects.

To develop, and deliver this workshop a faculty grant was obtained (Faculty part of the Utrecht Education Incentive Fund) (principle 10). From this grant the working hours of three of the facilitators could be covered. In addition, participants could be awarded 50 hours for participating in this course (which can be converted into money, depending on the department of the participant) and a small budget of € 250 for support, such as appointing a student to assist with the project.

4. First Results

While the first course is still underway, some of the first results concerning the research themes and evaluation outcomes can already be reported.

Participation in the course was voluntary and recruiting participants was done through several university websites, such as that of the CAT, the Teaching Academy of Utrecht University (TAUU) and the faculty intranet pages. In addition, directors of education of the departments within the Faculty of Science were approached to point the course out to their teachers. The aim of 8-12 participants was reached as the course started in October 2018 with 14 participants. Most of these participants were from the Faculty of Science (Pharmaceutical Sciences, Biology, Chemistry, Information and Computer Science), four of them were from other faculties but do have a connection with teaching science students. The attendance to the meetings so far was high, with every meeting between 12-14 participants.

After the first meeting, based on the interests of the participants and the SoTL-projects that they want to work on, four theme groups were formed by the participants: motivation, abstract concepts, feedback & (digital) tools, and teaching students the research cycle (principle 3)

The first experiences of the facilitators with the course are very positive. During the meeting many 'pennies dropped' for the participants. The roadmap worked very well in designing and structuring the course, but also to stimulates the participants to think in more detail about their teaching question, their context, the (mechanism behind) the learning of their students, and the way in which they can choose methods to provide evidence for the effectiveness of their teaching. The participants are all very enthusiastic, both in the group as well as in the individual meetings and every participant is right on schedule.

Challenges experienced in guiding the participants were to stimulate them not to make it too difficult for themselves and getting them to focus on a small problem or limited researchable teaching question. In line with the experiences reported by Hubball (2010) the science teachers of this course definitely find it a challenge to use more qualitative research methods[10]. This is not only a matter of using methods they do not know, but also especially changing their believes in the way they think about research, their research paradigms. Related to this, the ethical issues around doing research with students in the classroom was also a difficult concept for the participants, especially in relation to the design of their study such as the use of a control group. Finding the right literature relevant to their project was also something they needed plenty of support with, especially related to student leaning. In that sense, the book '*How learning works*' from Amrose *et al.* (2010) was proven to be an excellent starting point for them[15]. This book provides a first insight into theories behind learning of students in a very practical way and gives the participants a first insight into the 'mechanism (M)' of learning of the students (see 'CIMO-logic method').

After the first five meetings an online mid-term evaluation was performed with a questionnaire with, in total 27, open and closed (10 point likert-scale) questions.

The SoTL-approach of teaching was appreciated with a 7,8 ± 1,1 (n = 10) where most participants especially liked the more scientific, objective approach of SoTL. Most participants think that they will also use a SoTL approach in future questions about their teaching. However, they do see some problems, especially the time needed for approaching their teaching in a SoTL-way, and the lack of appreciation by colleagues and supervisors. They do have confidence, 7,2 ± 1,2 (n = 10), that they will finish the SoTL-project they are now working on as part of the course. The participants really appreciate the peer-discussions, both with all the participants of the course, (7,6 ± 1,6 (n = 10)) as well as in the theme group (7,8 ± 0,9 (n = 10)). Exchanging experiences is valued, especially because in their own work environment there is normally not much room for discussions about teaching. They feel that the theme groups have added value because the discussions are more focussed and therefore more relevant for their own project. Furthermore, inspiration and building a

network with teachers from other departments and faculties is mentioned as an added value of the contacts with the other participants. Some participants find the groups too small or too diverse to have an added value to their own project. They would also like to have more time in the meetings to work on the project plan and more theoretical depth in the course. As the most important point that the course did bring to the participants so far, they mention the structured, and critical thinking about teaching and learning of students. They indicate that the roadmap was definitely an aid in designing and structuring their project, and that it forced them to approach their project in a very systematic way.

5. Conclusion

Engaging teachers in SoTL to improve the quality of teaching and student learning and as a way of professional development of teachers requires development of support structures like pedagogical courses. This study describes the design of such a course based on a theoretical framework and evidence-based design principles. Preliminary results based on a midterm evaluation were presented.

The first edition of the course shows that the principle of creating a learning community, a creative supportive environment, and possibilities for (peer)feedback (principle 3,5,6) is successful and that the teachers appreciate being part of a community with plenty of opportunity for peer discussion, reflection and structured support for their SoTL-project. This environment stimulates them to reflect on their own learning, make their own choices and experiment with their own teaching (principle 4,5,7).

Most of the participants are still participating in the course and it is expected that they will share their results with the other participants or a broader public. After the course, more in-depth research will be performed, not only on the level of the participants' reactions and learning, but also whether taking part in a SoTL course has an effect on the participants' self-esteem, attitude, use of skills and knowledge, and behaviour towards teaching and learning experiences of students[19].

Establishing a SoTL-culture is of great value as encouraging and supporting teachers to engage in SoTL will improve the quality of teaching. It not only improves the learning of students, but also alters the way teachers think about teaching and learning, educational policy and practice, make professional judgements and develop themselves as teachers. The study will contribute to that by formulating design principles for SoTL-courses. In addition, it will identify success- and failure factors of SoTL-courses and support programmes as part of the academic development of teachers at Utrecht University.

Table 1
Overview of the interdisciplinary SoTL-course

Activity	Content	Activities
Meeting 1	— Getting to know each other — Identifying personal teaching questions — Introduction to SoTL	Group discussion, workshop, plenary presentation
Meeting 2	— Presentation Roadmap — Start working on first part project plan with aid of the roadmap (Context, Intervention, Mechanism and Outcome) — Inspiration: presentation of a SoTL-project of a teacher	Plenary presentation, group discussion, individual reflection
Meeting 3	— Literature research — Working on project plan (CIMO-part roadmap) — Formulating a research question	Group discussion, workshop, individual reflection, plenary presentation
Meeting 4	— Working on project plan (CIMO-part & research question roadmap) — Methodology: the role of beliefs and values in research — Study design & Methodology	Group discussion, individual reflection, workshop, plenary presentation
Mentoring	— Project plan	Individual meeting with skilled practitioner
Meeting 5	— Ethics: Human subjects considerations — Working on project plan (CIMO-part, research question & study design/methodology roadmap)	Workshop, individual reflections, presentations of projects by (some) participants
Mentoring	— Project	Individual meeting(s) with skilled practitioners on request during the last period of the course (meeting 6-10)
Meeting 6	— Methodology – data analysis — Projects	Presentations of projects by (some) participants, workshop
Meeting 7	— Data-analysis: quantitative and qualitative	Workshop by expert in the field of Methodology & Statistics
Meeting 8	— Data-analysis continued: problems and sharing — Projects	Group discussions, presentations of projects by (some) participants
Meeting 9	— Going Public: presenting and publishing	Workshop
Meeting 10	— Going public: presentation of the results of the projects	Presentations by the participants

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Teachers' opinion on the learning assessment in higher education: comparison between the Universities of the Basque Country and Bordeaux

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Abstract

The teaching support services of the Universities of Bordeaux (UB) and the Basque Country (UPV/EHU), MAPI and SAE-HELAZ respectively, are developing a joint Project, named EVA2020. The two main objectives are: i): to know the teachers' opinion about the evaluation processes performed on their subjects, and ii) to plan training actions for teachers aimed at achieving competency-based evaluation, and enhancing continuous, formative and sustainable assessment practices.

Concerning the first objective, the approach in each University is different. In UPV/EHU, the teachers' opinion is to be collected by means of a survey. In the case of UB, are being interviewed. In both cases, one student of each university was enrolled in this analysis process. In UPV/EHU, the student participated in the design of the survey, with the collaboration of several experts and prepared the documentation needed for the approval of the study by the Ethical Committee. In UB, a student hired by the MAPI conducted the interviews with the teachers and analyse them.

After the analysis and comparison phase, MAPI and SAE-HELAZ can plan the above-mentioned training actions for teachers to improve their evaluation skills.

1. Introduction

Euskampus [1] is a project jointly promoted by the University of the Basque Country-Euskal Herriko Unibertsitatea together with renowned research centers, which seeks to articulate the excellence and internationalization of the University and link it with the territory. The project is structured around a community of knowledge poles, spaces for multidisciplinary and inter-institutional collaboration that are defined in terms of social and global challenges. Since 2011, IdEx Bordeaux and Euskampus are working on a common project of great importance as part of a broad framework agreement signed in November 2014: the creation of a Euro-regional center of university excellence of international influence, the Bordeaux-Euskampus Cross-Border Campus. This joint work was reinforced when UB entered Euskampus Fundazioa.

During the third Euskampus-Bordeaux meeting held in June 2017, many research groups and services from both Universities were invited to contact and share, to find new collaboration niches. The teaching support services, SAE-HELAZ (Educational Advisory Service-Hezkuntzarako Laguntza Zerbitzua), from UPV/EHU, and MAPI (Mission d'Appui à la Pédagogie et à l'Innovation), from UB, had the opportunity to reconnect and talk about their structures, projects and common interests.

Both services give support to innovation projects and pedagogical advice to their faculty, and both of them have the opinion that the most influential part of the teaching &

learning process is assessment, but also, that assessment provokes the greatest headaches to faculty. SAE-HELAZ and MAPI have done a big effort to introduce active methodologies [2], working on alignment of competencies, with methodology, learning outcomes and assessment as the key for building curricula [3].

The implementation of the new university studies that followed the European Higher Education Area (EHEA) settlement was identified as a great opportunity to rethink curricula and focus on students' competencies and learning outcomes as their driving forces. Students should be assessed based on their achievement of such defining items [4], but we have realised that in most of the cases, this is not well done. Even more, assessment is not properly planned, communicated, nor practised. At least this is what can be deduced from a previous investigation conducted by Lukas *et al.* [5] which indicates that the students of UPV/EHU feel that teachers use assessment only for qualification purposes and almost never as an opportunity to improve learning, and, that it remains the same after EHEA creation and subsequent implementation of new degree studies.

Another source of information that can help deducing how assessment is carried out, is the syllabus of each subject. This is a picture, which reflects, although in a much-resumed manner, the practical aspects of it. A shallow analysis of such information is sufficient to assert the urgent need of this project.

Both services decided to start cross border collaboration in order to build a structure to help teachers to develop assessment based on the adequacy among learning outcomes, pedagogical methods and assessment criteria, which is the main objective of the project. To achieve it EVA2020 Project was drafted jointly, setting these three goals:

— Prepare a methodological guide for teachers.
— Build an associated formation.
— Build a team to walk with: tutors.

As a starting point, each university compiled the regulation about assessment in its context. During the conversations, it was found that in the two countries the qualification and verification is fairly different, so this would induce a differentiation in this part of the formative structure.

Simultaneously, they searched for relevant literature on assessment, focusing on the references written in both countries or in Spanish or French, not forgetting to retrieve relevant Anglo-Saxon references. The keywords used for the research were *assessment* combined with *principles, guidebook, system, strategy, learning outcomes, competency, formative, criteria* and *tools.*

Another basis on which to build such a structure must be the analysis of the situation on each University. The students' opinion is of critical importance, as they are the main characters of the assessment exercise. This research was already done in UPV/EHU, as mentioned before, and in process in UB.

As a fourth supporting point, the faculty's point of view is crucial to set the zero point of the formation: their perceptions and preconceptions, the possibilities for improvement, or the resistances to change.

This paper is focused on the description of the procedure carried out in both Universities to take a real picture of how the teachers face and carry out assessment.

Two students took part in this study. In UPV/EHU, Oihane Landazabal, student of the last year of the degree in Pedagogy, did her 3 months internship in SAE-HELAZ collaborating

in this project. Her Final Degree Project is related to this research also. MAPI has contracted one student, Pauline Barret to conduct the interviews with teachers and to do the transcription.

2. Methodology

The communication between both services is channelled through their directors by e-mail. Three virtual meetings were celebrated by videoconference, and face-to-face meetings took place two times in Urrugne (French Basque Country, halfway between Leioa and Bordeaux), two times in Bordeaux and another two in UPV/EHU. The language used to communicate was English, mixed with French and Spanish

To better reflect the reality, both partners decided to make a mixed quantitative-qualitative study [6]. The use of a questionnaire derived from the one used before to study the students' perceptions in UPV/EHU would permit to compare both points of view, but on the other hand, it would be necessary to know whether those questions are the ones that really concern the teachers. Several semi-directed interviews would give the clues. T

For the quantitative part of it, a survey has been proposed, based upon the one designed and used by Lukas *et al.* two times (2010 and 2016) to know the perceptions of the students of UPV/EHU about assessment.

This survey, consisting of 55 items classified in seven dimensions, was analysed and translated to reflect the point of view of the teachers over the same items. The answers were given using a 1-5 Lickert scale and so will be given this time too.

To classify the responders sociologically, the participants will be questioned about their gender, area of knowledge, age, years of experience as teachers, and whether they have attended any courses related to pedagogy or assessment previously. Anonymity will be guaranteed.

For the recruitment of the responders in UPV/EHU, two main methods will be applied: the first one is to invite the participants in other courses and workshops organised by SAE-HELAZ to respond it online and anonymously. These responders correspond to the EHU-1 group. The other method will be the invitation to take part in a study to know what can be improved about assessment. This invitation will be published in the everyday bulletin board. The professors who volunteer to respond the questionnaire will conform the group EHU-2.

This project is being evaluated by the Ethics Committee of UPV/EHU before entering the survey validation process. The validation will be accomplished, firstly, with the consultation to three expert researchers about the relevance and the formulation of the questions, reliability of the questionnaire and what to add or to delete. Secondly, a pilot sample of teachers will be invited to respond the resulting questionnaire and to give their opinion about the comprehension of the items.

After validation, the questionnaire will be sent via e-mail to EHU-1 group, and the announcement to request volunteers to participate in the research will be published in the beginning of next semester (EHU-2 group).

The qualitative part of the study consisted of semi-structured interviews to 30 professors from UB teaching several disciplines and levels. Each interview lasted 1.5 h approximately, was built to get information about these items:

— their experiences and representations of assessment

— where are and what are the impediments for a real change of practice with reference to assessment
— the more indications possible about different learning contexts.

The selection of the candidates to take part in these interviews was made attending to the variety of diplomes offered in the University of Bordeaux, balancing the areas of knowledge of the staff and the gender.

3. Results

The experience may be placed into the Students as partners framework, although it is a very modest one. In UPV/EHU, O. Landazabal has been working at SAE-HELAZ during her internship for three months (September-December 2018). She has collaborated in reviewing the bibliography, defining the questionnaire, and preparing the instrument to collect and analyse the responses. She also took part in the composition of the report sent to the Ethics Committee in order to get the corresponding guarantee.

In UB, Pauline Barret is employed for 5 months. Her duties are to conduct the interviews and to analyse their contents to identify common characteristics, practices and concerns related to assessment practices.

From their point of view, it can be said that taking part in the EVA2020 project is participating in the beginning of the construction of the answer to an educative problem. This aim is of radical importance: it will provoke changes in the parameters that modulate the pedagogical paradigm and the teaching and learning process. It comes to change the understanding of assessment, as it will modify the teachers' point of view through their formation.

O. Landazabal, as a pedagogy student, has tried to make the most of the experience. It has been an opportunity to develop her pedagogyst profile: learn about procedures, techniques, protocols, dynamics, or professional careers. She felt like crossing the barriers from student to teacher, and acting as any member of SAE-HELAZ. The team found her as another reliable member, and let her take the initiative to contact some experienced teachers who gave their opinion about how to transform the inquiry from student-focused to teacher-focused: changing her role from student to colleague, confronting her ideas with her former teachers. She felt comfortable about her theoretical knowledge, but unexperienced, being this a great opportunity to improve this aspect.

3.1. Quantitative Study

The preparation of the inquiry started with the analysis of the previously used one. All the 55 items were modified to change the point of view from the student to the teacher. This meant to change from the receptor of the assessment process or the assessed object in some cases, to the agent who has the responsibility to evaluate and rate this object; in other words, from the third person to the first one.

Some items were eliminated, for example, "Assessment is a way teachers use to control their students". This item was considered offensive to teachers. Some others were eliminated because they were nonsense: "I try to correct my mistakes after being assessed" or "Assessment should be eliminated from University" among others. Finally, it was reduced to 35 items

One of the motivations to delete some items was to shorten the time required to complete the inquiry. It is commonly recognised that one responder can answer one ranking item per minute; therefore, a questionnaire consisting of more than 35 questions will take too much time to be completed, as the abandonment rate in an on-line questionnaire after 30 minutes is more than 50% [7].

The seven dimensions considered in this study (*Figure 1*) are the following, each of them with different numbers of questions:

1. Intentionality of assessment: refers to the purpose attributed to the evaluation. That is, what is the assessment of learning carried out for, according to the vision of the teaching staff.
2. Subject of the evaluation: describes what type of learning is assessed in university education according to the experience of teaching staff
3. Evaluator / student participation: refers to the role of teachers and students in the assessment process.
4. Moments of assessment: pretend to know when the assessment of learning takes place during the university teaching process.
5. Assessment techniques: refers to the variety of techniques and procedures used to collect information when the evaluation of learning is carried out
6. Evaluation and qualification criteria: it gathers information related to transparency in the communication of the criteria used to evaluate the students' learning, the comprehension thereof and the weighting of the qualification.
7. Feedback: explains the mode and content of the information that is provided to the students about the results of the evaluation, and its consequences in order to improve learning.

Figure 1

Proportion of questions regarding each dimension

Teachers who usually attend the courses and workshops offered by SAE-HELAZ and MAPI may have a more profound knowledge about what assessment is meant to be: a part of the process of teaching and learning which occurs all along it, in any occasion in which the student receives a word about his or her performance. Every year more than 900 teachers assist to SAE-HELAZ courses. This population may be more willing to participate in the survey, but their answer would be skewed. These teachers will be invited to take part in the study, conforming the EHU-1 group. We expect to get more than 200 participants of these captive populations.

In order to get a more realistic representation of the faculty's opinion about assessment and the reality of the process, the sample must be as plural as possible. From a population of ca. 4,500 teachers in UPV/EHU, it is assumed that the participation could reach 200 responses easily (EHU-2 group). These EHU-1 and EHU-2 groups will give a complete panorama.

The quantitative part of the research is in a standby, until the Ethics Committee of UPV/EHU gives its approval. From the analysis of the results and after comparing them with the ones obtained in the previous study by Lukas *et al.*, it will be possible to answer to this question: do students and academy share the same concerns about assessment?

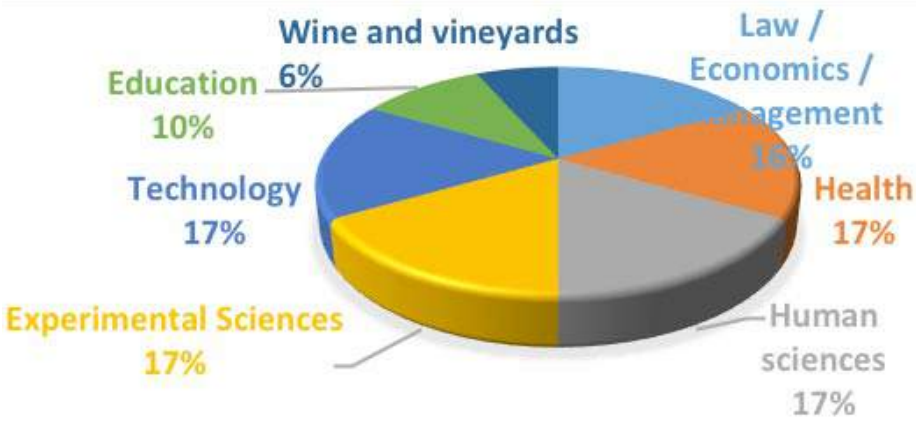
3.2. Qualitative Study

This part of the study has two important objectives: the first one is to get a more rich information about how the teachers represent assessment. The second one is to compare the more relevant aspects and concerns about assessment to the teachers with respect to the ones that were selected to build the questionnaire.

The interviews started in March and will be finished for the end of the semester. 30 teachers, 50% female and 50% male are being interviewed, corresponding to several areas of knowledge (*Figure 2*): Law, Economics, Health Sciences, Experimental Sciences, Engineering, Social Sciences and Education.

The subjects they are teaching are of very different nature and are located in any year of the university studies. These participants belong to the permanent staff as well as to the non-permanent one.

Figure 2
Distribution of interviewed teachers among areas of knowledge



Teachers were questioned about the way they carry out the assessment processes. They described one situation and afterwards, they were demanded to describe a second one, the most different one they could imagine. In order to facilitate this description, the interviewer directed the dialog using some questions:

— Which are the things they take into account when planning an assessment exercise?

— When do they think about how to evaluate their students' performance? Selection of tools, rating, what to be expected?
— Which constraints do they find during the process, i.e. for selecting the type of evaluation?

Teachers had to explain which of those two situations they preferred and why. The last part of the interview was dedicated to the general representations about assessment: its importance, is it essential or not, their ideal assessment. Finally, how they feel about assessment: their sense of mastery, major difficulties.

To the date of finishing this paper, it has been impossible to analyse the interviews. Once they all are finished, Pauline will extract the common ideas and concerns, and the MAPI team will compare them with the ones addressed in the survey. From this comparison, it will be concluded if the teaching staff is worried about the same issues as their support services. It will also be important to know how different or similar both communities are, and therefore, if the same formative programs and strategies can be planned.

4. Concluding Remarks

Two universities, located in two neighboring countries, which speak different languages and with different structures, cultures and regulations, have observed that they have to face the same problem: how to transform an assessment system centered on knowledge of the subject taught to a system of evaluation of learning outcomes aligned with the methodology and the development of competences.

In this phase of the collaborative project EVA2020, it is concluded that:

— In the first place, they coincide in taking a previous photograph of the representations and practices that the teaching staff has on the evaluation to guide the actions of improvement and assessment.
— Secondly, they agree to produce jointly a teacher support guide adjusted to the needs detected and aligned with the regulations of each university in the Common European Framework of Higher Education.
— Finally, they will form a cross-border team in each university that will provide training and advise their faculties in the design of their evaluation systems, to be continuous, formative and sustainable.

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The Scholarship of Teaching and Learning paves the way for Educational Improvement in Kinesiology

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Abstract

The Scholarship of Teaching and Learning (SoTL) big tent definition invites us to include unexplored fields. The International Kinesiology College is a worldwide organisation of certified instructors teaching a common curriculum in private colleges. This study examines the impact of introducing SoTL into academic development from 2015 to 2018.

Our SoTL focus was to make teaching and student learning visible, open to peer review and available for others to build on. New initiatives were introduced – search conference (O'Brien 2001), research presentations, instructor hangouts and a professional development workshop. I used an autoethnography methodology (Ellis & Bochner 2000) and conducted a thematic analysis of the reflective journal which recorded my experience, thoughts and emotions. The instructors' voice was gathered by questionnaire and both perspectives were compared to the literature. SoTL 4M framework (Friberg 2016) was used to map projects by organisational level. The impact criteria were changes in the number, frequency and quality of conversations (Mårtensson 2017), changes in the level of awareness/ understanding and changes in practice/policy (Hutchings 2000; Stoakes 2013).

The findings show no engagement with the meso level search conference but increases in the number and frequency of meaningful conversations and changes to practice were reported at macro level. A comparison to the literature shows the difficulties of introducing SoTL improvements were consistent over time (Kelly 2000; McCarthy & Higgs 2005; Gibbs 2013; Noorma 2017; Brost 2017) and the importance of working within a community (Cerbin 2000; Duffy 2000; McCarthy & Higgs 2005; Mårtensson & Roxå 2016a). The 4M map highlighted that impact varied by organisational level but analysis relates this variance to the significance of the meso microcultures - dialogical (strong or developing) versus non-dialogical (Mårtensson & Roxå 2016b; Kjær *et al.,* 2017). SoTL is helping the IKC to grow by highlighting both a pathway to improvement and potential challenges.

A limitation of this study is the impact identified refers mostly to teaching and the next phase will explore impact on student learning. The important question that remains is how can we bring the unwilling voices of the non-dialogical meso microcultures into teaching and learning conversations?

1. Introduction

As academic developers we want to know if our improvement initiatives are meaningful. This requires us to make any impact visible by identifying and naming the changes but Bamber and Stefani (2016) pointed out that we need to move beyond identifying mere *impact* by way of numbers of courses attended to a more real measure of the *value* of academic development to include a much broader range of outcomes such as opinion and judgement.

One of the difficulties with rolling out improvements is that often teachers do not want to change (Kelly 2000; Brost 2017; Noorma 2017) but Brost (2017) also pointed out that it is more than not wanting to change, teachers are resistant to change often displaying hostility, anger and irritation. Gibbs (2013) highlighted the importance of the local culture and advised that "there is a limit to impact of sole individual teachers where the local micro culture is

hostile". Another difficulty identified by Duffy (2000) and McCarthy & Higgs (2005) is the issue of time. Teachers have to make time to carry out research, meet and share what they discover and the process of sharing does not happen quickly, it also takes time for results to show. In their 2005 paper McCarthy & Higgs reported that they had been working on developing SoTL at University College Cork for three years and Noorma (2017) reports how things changed in Estonia over a ten-year period.

The literature also highlights the importance of building a community as a support measure in introducing SoTL. Cerbin (2000) reported the key factor that made a difference for him was having like-minded colleagues which encouraged and motivated him while Duffy (2000) talked about how community support helped her to re-group and re-focus especially when things didn't work. McCarthy & Higgs (2005) advised how they built a community in UCC by teachers sitting together and sharing but point out that sharing is a habit and the audience will create the need for more sharing. Additionally, the authors also point to the importance of creating this community within a supportive culture. McCarthy (2007) tells us that at UCC they did not solve problems but rather gave themselves time and space to name, discuss and share problems using an investigative approach. Mårtensson & Roxå (2016a) also pointed not only to the importance of developing a community of practice but also how we must look at teachers within their local contexts, the meso level micro cultures.

The aim of this ongoing study is to examine the impact of introducing SoTL into academic development in kinesiology and this paper presents the emerging results of an ongoing study for the three years from 2015 to 2018.

2. Methods

2.1. Institutional Context

The International Kinesiology College (IKC) is a worldwide organisation represented in sixty-six countries with around 1500 certified instructors teaching the "Touch for Health" programme using a common curriculum in private colleges. The IKC has a hierarchical structure (Executive Board, School Board, Country Faculty, Instructors) and communication with the instructors is through the country faculty. Instructors meet at country level for a two-day update with their country faculty and peers every three years.

I started this journey mapping educational improvement in 2015/2016 as part of completing a Masters in Teaching and Learning in Higher Education at University College Cork and I have continued to develop, introduce and implement improvement initiatives since then. Initially my studies concentrated on the meso level within the Irish context but then it subsequently developed into a macro level international project.

2.2. Research Questions

The questions guiding my research are:

— How could we improve our teaching and student learning?
— What is the impact/value of our educational improvement initiatives?
— How can we research and evidence this impact and value?

2.3. Improvement Initiatives

I identified the aspects of SOTL of making teaching and learning visible, open to peer review and available for others to build on Shulman (1993) as the main starting point.

I created four new initiatives:

1. Search Conference - a 2015 meeting of Irish instructors to find out what they wanted.
2. Research Presentations - from 2017 ongoing dissemination of findings of classroom research at international level, both at Teaching & Learning and Kinesiology conferences.
3. Instructor Hangouts - from 2018 ongoing online one-hour bimonthly international meetings, using the ZOOM platform, where instructors get together to discuss teaching and learning topics.
4. Professional Development Workshop - started in 2018 "Making the Invisible Visible" which focuses on a developmental model of instructor Continuing Professional Development.

2.4. Impact Criteria

The impact criteria I selected were selected as follows:

1. Changes in number, frequency and quality of conversations (Mårtensson 2017 p. 6).
2. Changes in thought, awareness and understanding (Hutchings 2000 p. 8; Stoakes 2013 p. 37).
3. Changes in practice and policy (Hutchings 2000 p.8; Stoakes 2013 p. 37).

2.5. Data Collection and Analysis

A qualitative methodology using autoethnography was employed (Ellis & Bochner 2000). This research method was chosen as it promotes the inclusion of the experience, thoughts and emotions of the teacher as researcher which aligns well with Bamber & Stefani's (2016). This was also an appropriate methodology from which to view impact at different organisational levels. I conducted a thematic analysis of my reflective journal for the period from 2015 to 2018 which recorded my experience, thoughts and emotions. Additionally, the instructors voice was gathered by questionnaire. The results for each of the four initiatives in 2.3 were summarised against the three criteria in 2.4. I also used the SoTL 4M framework as a tool for reflection on organisational impact and value (Friberg 2016). The 4M framework describes SoTL at four organisational levels: micro —own classroom, meso— department, macro —institution, mega— beyond one institution. I re-defined the levels for kinesiology with meso referring to IKC national level, macro being IKC international level and mega level detailing impact beyond the IKC.

3. Results

Using a matrix adapted from Stoakes (2013) the following sections examine each of the four improvement initiatives against our stated impact criteria to determine their impact or value.

3.1. Search Conference

The Irish instructors did not engage with the 2015 search conference invite (1 out of 17 accepted; 3 out of 17 replied) and the meeting did not go ahead. There were a couple of further attempts to set up another meeting in 2016 but there was still little interest (3 out of 17 accepted). While there was no impact on the instructors, this process raised my thought, awareness and understanding as teacher/researcher as it confirmed the lack of engagement at this meso level.

Table 1
Impact/Value of Search Conference

Impact Criteria			
Scale of Impact	**Number, Frequency & Quality of Conversations**	**Thought, Awareness & Understanding**	**Practice & Policy**
My own		✓	
Instructors			
Not at all	✓		✓
Evidence	Reflective Journal		

3.2. Research Presentations

The presentation of my classroom action research findings at international teaching and learning conferences raised my confidence as a teacher researcher and gave me an audience for my work. The presentations at international kinesiology conferences raised awareness of new possibilities with the work I had done so far and what I was trying to achieve. It also identified people who would be interested in getting involved. After my first IKC conference presentation in October 2017 I received emails from four members of the UK team expressing their interest in getting involved with this work, asking what support I needed or how they could help me develop it further. New conversations started from there but it quickly became clear that we needed new communication channels to accommodate and support these conversations.

Table 2
Impact/Value of Research Presentations

Impact Criteria			
Scale of Impact	**Number, Frequency & Quality of Conversations**	**Thought, Awareness & Understanding**	**Practice & Policy**
My own	✓	✓	
Instructors	✓	✓	
Not at all			✓
Evidence	Reflective Journal; E mail Correspondence		

3.3. Instructor Hangouts

In 2018 we held three international hangouts, online conversations bringing together a total of twenty-three instructors from six countries (Ireland, UK, US, Canada, Dubai and Costa Rica). By 2019 these hangouts are now a monthly event aiming to support us to connect, share, build with and from each other. As instructors previously did not have an organisational channel of talking with each other on an ongoing informal basis, the main change was in the number, frequency and quality of conversations. The quality of the conversations was a priority and this was ensured through a focus on teaching and learning topics suggested by both the facilitator and/or the participants. The process of sharing was actively promoted and continued beyond the hangout to engage the wider instructor community via social media in the existing international closed Facebook group. As demand exceeded supply, the new development in 2019 is the upcoming (April 2019) roll out of Hangout Facilitator Training so we will have more facilitators and lots more conversations around the world. This workshop was fully booked once advertised in less than twenty-four hours. As a result of these conversations we have seen changes to practice such as more sharing both of ideas and problems, and building on good ideas with instructors making changes in their teaching practice and being willing to try out new things. This points also to a change in thought and awareness.

Table 3
Impact/Value of Instructor Hangouts

Impact Criteria			
Scale of Impact	**Number, Frequency & Quality of Conversations**	**Thought, Awareness & Understanding**	**Practice & Policy**
My own	✓	✓	✓
Instructors	✓	✓	✓
Not at all			
Evidence	Hangout minutes; # Facebook conversations; Reflective Journal		

3.4. Professional Development Workshop

As some of the hangout participants wanted to do a deep dive into more teaching and learning ideas, a one-day CPD workshop based on a developmental model was introduced. During this day we explored our teaching practices and most participants signed up for the assessment which was writing a reflective journal over three months. With this dedicated time to investigate, we saw changes to the level of thought, awareness and understanding and also changes to practice such as a focus on student centred learning, understanding the value of student curiosity and softening the lesson plans. The day provided a unique opportunity for a long conversation at a deep level. There are also early indications of upcoming changes in 2019 to policy at meso level. Participants who completed the assessment requested an Ongoing Inquiry group which was set up and meets every two months.

Table 4
Impact/Value of Professional Development Workshop

Impact Criteria			
Scale of Impact	**Number, Frequency & Quality of Conversations**	**Thought, Awareness & Understanding**	**Practice & Policy**
My own	✓	✓	✓
Instructors	✓	✓	✓
Not at all			
Evidence	Workshop Evaluation Forms, Questionnaires, E Mail Correspondence.		

3.5. Mapping to the SoTL 4M Framework – what does this tell us?

The map highlights that disseminating at macro and mega levels had the greatest impact or potential impact compared to micro classroom level where the reach was restricted to class size. The UK direct reach refers to participants in the hangouts or workshops but the indirect reach which is an estimate, refers to the wider community who took part in the subsequent social media conversations. The actual number reached, but who did not engage in conversation, will be higher.

Table 5
The SoTL 4M Map showing impact and reach over the four organisational levels

SOTL 4M Map			
Micro Classroom	**Meso National Level**	**Macro International-IKC**	**Mega Beyond IKC**
Reach: 7 Fixed	Ireland - Reach: 1 UK Direct Reach: 12+ UK Indirect: 30+ recurring Other Countries: 4	Reach: Estimated 30+ Increasing	Reach: Unmeasurable

4. Discussion

This paper describes the preliminary findings from an ongoing study which is examining the impact of SoTL improvements, through qualitative data using an autoethnographic lens, which brings in multiple perspectives. The emerging findings are that impact/value was shown, by research presentations which kick started the process, and more particularly from the Hangouts and CPD workshop, over all criteria categories - changes in meaningful conversations, changes in thinking/understanding and changes in practice/policy.

However, the SoTL 4M map also highlighted that impact varied by organisational level. Reflection suggests that this variance was due to the significance of the meso level

micro cultures, whether dialogical or non-dialogical (Mårtensson and Roxå 2016b, Kjær *et al.*, 2017). In Ireland there has been little engagement with these improvements so far while in contrast in the UK, instructors engaged with the new initiatives, perhaps pointing to The Market versus The Commons microcultures (Roxå and Mårtensson 2015). I can identify with the feelings expressed by Kelly (2000) "there's an audience for the work beyond the campus, but if my own department isn't affected, it would be a shame". Even though the search conference did not go ahead, the process impacted me as teacher and guided me to take the improvement ideas to a wider audience at IKC international macro level. Mårtensson and Roxå (2016b) recommend consideration of the meso level micro cultures which proved to be important in this case and initial efforts are perhaps best targeted at the existing dialogical meso micro cultures.

Formal communication channels within the IKC are top down through the country head. The new initiatives I introduced provide additional informal communication channels supporting the existing structure and are creating an enhanced sense of sharing, support and community among the instructors on the ground level worldwide who choose to participate.

A limitation of this study is that the impact/value identified refers mostly to teaching and the next phase will explore the impact/value on student learning. Also, we did not conduct an independent verification on the gathering, conclusion and judgement of the evidence and impact assessment, recommended as best practice by Stoakes (2013). This will be incorporated going forward. The important questions that remain are do we concentrate improvements within the dialogical meso micro cultures or is it important to include the voices of the non-dialogical meso microcultures and if so, how do we get them to join in the teaching and learning conversations?

SoTL has great potential in new fields as it can pave the way to educational improvement. SoTL also highlights the challenges that may lie ahead and I think this is one of the most useful contributions to newcomers. What this study has shown is that these challenges, such as resistance to change, do not disappear over the years. They show up again and again, but being aware of them as an academic developer, allows you to seek out a receptive audience with whom you can implement improvements.

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Transformer l'évaluation dans l'enseignement supérieur: deux enquêtes comparatives auprès des étudiants de l'Université de Bordeaux (UB) et de l'Université du Pays Basque (UPV/EHU)

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Abstract

The teaching support services of the Universities of Bordeaux (UB) and the Basque Country (UPV/EHU), MAPI and SAE-HELAZ respectively, are developing a joint project, named EVA2020, in order to get two main objectives:

— to know the teachers' and student's opinion about the evaluation processes performed on their subjects, and
— to plan training actions for teachers aimed at achieving competency-based evaluation, and enhancing continuous, formative and sustainable assessment practices.

Both partners of EVA2020 project are confronted with the fact that the development of skills needed to assess learning outcomes is still a major issue in teachers' professional training, which is generally underestimated. The first goal of our project is to build a realistic picture of those questions by producing data on representations and practices through interviews with both students and teachers. As a second step, we will use these data to create tools and resources to help teachers improve their assessment process. For this purpose, we conducted two surveys simultaneously in UB and UPV: on one hand, we collected student's representations and experiences; students are thus fully involved in the project. On the other hand, we interviewed teachers about their representations and real practices. This presentation will show comparative results of the surveys conducted with students in our two universities (a second presentation shows surveys concerning teachers).

1. Introduction

Les services de soutien à la pédagogie des universités de Bordeaux (MAPI) et du Pays basque (SAE-HELAZ) développent un projet commun, baptisé EVA2020, visant à atteindre deux objectifs principaux :

— connaître l'opinion des étudiants et des enseignants sur les processus d'évaluation réalisés dans leurs matières,
— constituer un ensemble d'outils, de ressources, et d'actions de formation et d'accompagnement pour les enseignants visant à améliorer les pratiques d'évaluation continues, formatives et sommatives.

Les deux partenaires du projet EVA2020 sont confrontés au fait que le développement des compétences nécessaires pour évaluer les acquis d'apprentissage reste un problème majeur et généralement sous-estimé dans la formation professionnelle des enseignants.

Le premier objectif de notre projet est de dresser un tableau réaliste de ces questions en produisant des données sur les représentations et les pratiques au moyen de questionnaires et d'entretiens avec des étudiants et des enseignants. Dans un deuxième temps, nous utiliserons ces données pour créer des outils et des ressources permettant aux enseignants d'améliorer leur processus d'évaluation.

A cette fin, nous avons mené deux enquêtes simultanément à Université de Bordeaux (UB) et à l'université du Pays Basque (UPV/EHU): d'une part, nous avons recueilli les représentations et les expériences des étudiants ; d'autre part, nous avons interrogé des enseignants sur leurs représentations et leurs pratiques réelles. Cette communication présente les résultats comparatifs des enquêtes menées auprès des étudiants dans nos deux universités (une seconde communication est proposée pour ce qui concerne les enquêtes auprès des enseignants).

2. Methodologie

Afin de mener cette étude comparative, nous avons adopté un questionnaire identique à celui réalisé par Lukas Mujika *et al.* auprès des étudiants de l'UPV/EHU qui a donné lieu à publication [1]. Il est composé de 55 items, distribués en 9 dimensions et interroge les conceptions, les attitudes et les expériences des étudiants concernant l'évaluation pratiquée dans leur université. Les étudiants sont amenés à se prononcer sur leur degré d'accord ou de désaccord aux propositions qui leur sont faites sur l'évaluation. Les réponses sont codées selon une échelle de Lickert du total désaccord (1 point) au complet accord (5 points).

Au Pays Basque, l'étude a été réalisée en deux phases (en 2010 et 2015), auprès d'un échantillon représentatif de la population étudiante répartie dans les différentes facultés de l'université. Les participants étaient des étudiants de troisième et quatrième années, déjà familiarisés avec les processus d'évaluation suivis dans les différentes matières de leurs diplômes. Le nombre total de participants est de 1.407.

A Bordeaux, l'étude s'est effectuée sur une période de 40 jours (du 7 février au 18 mars 2019). Les participants contactés sont les étudiants de l'université de Bordeaux, inscrits dans les cursus de 1er et 2ème cycle universitaire, dans l'une des sept composantes de l'université. Sur les 47.006 email(s) délivrés; 5.000 étudiants ont lu le message envoyé initialement et 6.076 étudiants ont répondu. Le taux de retour global est donc de 10,69%

Tableau 1
Distribution des participants dans les deux universités

Université du Pays Basque			Université de Bordeaux		
			Droit/Economie/Gestion	1.933	31,81%
Sanitarias	338	24,02%	Santé	886	14,58%
Sociales	228	16,20%	Sciences de l'homme	882	14,52%
Ciencias	107	7,60%	Sciences et Techniques	1.328	21,86%
Ingenierías	325	23,10%	Technologie	604	9,94%
Educación	292	20,75%	Education	400	6,58%
Humanidades	117	8,32%			
			Vin et Vigne	43	0,71%
Total	1.407	100%		6.076	100,00%

Le questionnaire UB a été quelque peu modifié car certaines questions du questionnaire UPV/EHU étaient peu adaptées au contexte français ou parfois difficilement traductibles pour être comprises par des étudiants français. Les études comparatistes en éducation présentent des limites certaines dans la mesure où comme l'écrivent Bourdieu et Passeron [2] : « *Le système d'éducation est sans doute celui dont les techniques de «production» et les «produits» se laissent le plus difficilement dissocier des valeurs singulières, liées à une société et à une culture particulières, puisqu'il est l'instrument de leur perpétuation*. » Toutefois, nous avons réalisé un questionnaire composé de 53 items que nous avons répartis dans les mêmes trois blocs du questionnaire basque : conceptions, attitudes, expériences. La question 53 est particulière dans la mesure où elle permet aux étudiants de laisser un commentaire libre.

3. Resultats

Nous reprenons ci-dessous 11 entrées d'analyse étudiées dans chacune des enquêtes :

3.1. Perceptions étudiantes de l'évaluation

A l'UPV/EHU « *on observe que, selon les étudiants, la manière d'évaluer conditionne leurs stratégies de travail mais les étudiantes ne perçoivent pas l'utilité des évaluations comme facteur de motivation* » ([1], p. 109). A Bordeaux, majoritairement les étudiants pensent que les évaluations leur sont utiles (item 14-54,5% d'accord) et devraient servir à prendre conscience de leur niveau d'apprentissage (item 8-61,6% d'accord). Elles les incitent à apprendre (item 15-58,4% d'accord) mais plus par contrainte que par motivation (item 5, 49,3%).

3.2. Participation des étudiants au processus d'évaluation

Au Pays Basque, on observe un « *bas niveau de participation des étudiants à leurs évaluations* » ([1], p. 109). C'est le même cas à Bordeaux où on note le faible niveau voire l'absence de participation des étudiants à leurs évaluations autant pour définir les critères d'évaluation (item 44-3,6%) que dans leur contribution au dispositif-même de l'évaluation.

Ces données montrent que dans nos deux institutions la responsabilité de l'évaluation incombe presqu'exclusivement aux professeurs, qui sans doute ne pensent pas qu'ils pourraient « faire entrer » les étudiants dans le processus.

3.3. Transparence des critères et des procédures d'évaluation

Ici les résultats sont très opposés. Au Pays Basque « les étudiants déclarent qu'ils connaissent les procédures et les critères avec lesquels ils sont évalués » ([1], p. 110) tandis qu'à Bordeaux, pour moitié, les étudiants ne connaissent pas et ne comprennent pas les critères d'évaluation des acquis d'apprentissage. Ce qu'ils connaissent bien par contre, ce sont les critères de validation des UE et du diplôme (item 45-58,3%).

On pourrait interpréter la divergence de ces résultats par le fait qu'à l'UPV/EHU la publication des syllabus est très fréquente alors qu'à Bordeaux seule la publication des moda-

lités de contrôle des connaissances[1] est obligatoire (cette publication ne permet pas d'entrer dans les détails des critères d'appréciation des acquis d'apprentissage).

3.4. Intégration de l'évaluation dans le processus d'enseignement apprentissage

A Bordeaux (item 29-26,50%) comme au Pays Basque, les étudiants n'ont pas le sentiment d'être évalués de manière continue. C'est le contrôle terminal qui prime (item 28-66,40%). Cette indigence sur l'évaluation continue et formative se retrouve fortement dans les commentaires des étudiants de Bordeaux (question 53).

En outre, les étudiants basques pensent que « *les différentes activités réalisées au cours du cours sont prises en compte dans leurs évaluations* » ([1], p.110). Cet avis est plus partagé chez les étudiants bordelais (item 35-44,6%).

3.5. Ressentis des étudiants avant leurs évaluations

Dans nos deux universités l'évaluation est fortement associée à des situations de tension, de nervosité et d'anxiété (item 17-82% déclarent leur anxiété à Bordeaux). Cependant les étudiants français rejettent majoritairement l'idée qu'on pourrait se passer des évaluations (item 16-seuls 16,8% y seraient favorables). Cet avis est plus partagé au Pays Basque.

3.6. Feedbacks

Le retour d'informations fourni par l'évaluation est une question importante tant elle conditionne la qualité formative même du processus d'évaluation. Au Pays Basque « *de l'avis des étudiants, l'évaluation n'inclut pas de lignes directrices ni de recommandations sur la manière d'améliorer leur apprentissage. Les étudiants essaient de surmonter eux-mêmes les lacunes et les difficultés* » ([1], p. 110). C'est aussi nettement le même avis chez les étudiants bordelais qui s'accordent pour dire que leurs évaluations ne sont pas suivies de recommandations pour l'apprentissage (item 51-69,9% ; item 49-59,9 ; Item 50-63,7%) et qu'ils n'ont que la valeur des notes pour essayer de se corriger (item 52-66,16%) d'autant plus que la publication des résultats est très tardive (item 46-67%).

Cette question (comme celle de la participation des étudiants) nous semble mériter une attention particulière lorsqu'il s'agira de créer des outils et des ressources permettant aux enseignants d'améliorer leur processus d'évaluation.

3.7. Qualité technique de l'évaluation

C'est un résultat notoire, à l'UPV/EHU comme à Bordeaux la question de l'équité dans l'évaluation se pose. Au Pays Basque « *les étudiants émettent des doutes sur la manière de mener*

[1] Les modalités de contrôle des connaissances réglementent les conditions d'obtention de chacun des diplômes délivrés par l'Université de Bordeaux. Elles sont obligatoirement arrêtées et portées à la connaissance des étudiants au plus tard à la fin du premier mois de l'année d'enseignement et **ne peuvent être modifiées en cours d'année**.

Un **syllabus**, dans le domaine de la pédagogie, est le résumé du cours d'un enseignant. Il annonce le contenu du cours, avec son plan développé, mais aussi de multiples informations comme : le niveau prérequis, le déroulement et l'organisation pratique, le nombre de *crédits* représentés, les coordonnées de l'enseignant, ou les modalités d'évaluation.

à bien les évaluations, l'équité et la transparence du processus d'évaluation » ([1], p. 112), c'est aussi le cas à Bordeaux où une majorité des étudiants pense que les évaluations sont globalement inéquitables (item 20-seuls 27,90% l'estiment équitables).

Quant au fait de savoir si les évaluations reflètent bien ce qu'ils ont appris, à l'UPV/EHU c'est un avis négatif qui prédomine, tandis qu'à Bordeaux les avis sont plus partagés.

3.8. Importance de l'examen final

A Bordeaux, les étudiants s'accordent pour dire que l'examen écrit est le principal mode d'évaluation des apprentissages (item 38-77,7%) et qu'il prend place le plus souvent à l'issue du processus d'apprentissage (item 28-66,4%). Au Pays Basque on pense aussi que l'examen final reste l'instrument d'évaluation le plus utilisé.

Ce poids important de l'examen final montre en creux ce que nous évoquions plus haut, le poids faible des contrôles continus et plus généralement du caractère formatif de l'évaluation.

3.9. L'évaluation comme moyen de faciliter les décisions des professeurs sur les étudiants

L'évaluation est utile pour les enseignants (item 13-60,8%), c'est ce que pensent majoritairement les étudiants basques et bordelais ; autant pour « *certifier les étudiants* » ([1], p. 113) que pour contrôler leur travail (item 4-71,6%). Notons encore qu'à Bordeaux, on s'accorde pour penser que les enseignants n'utilisent pas les évaluations pour sanctionner les étudiants (item 12-48,10%).

3.10. Contenus et objets des évaluations

Une très grande majorité d'étudiants bordelais (item 23-90,4%) considèrent que les évaluations portent sur avant tout sur les connaissances théoriques données lors des enseignements et peu sur les attitudes et les valeurs (item 25-11,6%) qu'ils incarnent. C'est aussi fortement le même avis qui prédomine au Pays Basque. Est-on capable dans nos deux universités d'évaluer autre chose que les seuls savoirs théoriques ? Peut-on diversifier nos approches afin d'évaluer d'autres aspects du parcours étudiant : compétences, attitudes, valeurs, esprit critique ? C'est un enjeu important qu'il nous faudra prendre en compte dans le futur pour interroger et éventuellement conseiller les enseignants sur ces aspects.

3.11. Auto-évaluation et évaluation entre pairs

Comme nous l'évoquions plus haut, les étudiants pensent que l'évaluation est plutôt l'affaire de l'enseignant. Au Pays Basque, « *les étudiants ne pensent pas que l'évaluation entre pairs et auto-évaluation sont mises en œuvre dans leur université* » ([1], p. 113). Nous sommes surpris par le pourcentage important d'étudiants déclarant à Bordeaux pratiquer l'auto-évaluation (item 32-38, 10%). Peut-être ont-ils compris la question comme une auto-évaluation non formalisée et pratiquée naturellement tout au long du processus d'apprentissage ? Cela demandera des investigations plus détaillées par collège d'enseignement et par l'analyse de corrélations sur des variables choisies.

Tableau 2
Questionnaire et résultats de l'enquête

		Accord		Ni accord ni désaccord		Pas d'accord	
Définition évaluation							
	Selon vous l'évaluation sert à						
1	Mesurer les apprentissages	4.909	81,10%	597	9,90%	548	9,10%
2	Vérifier l'atteinte des objectifs visés...	4.818	79,60%	695	11,50%	541	8,90%
3	Pointer les réussites ou les lacunes de...	3.554	58,70%	1.146	18,90%	1.354	22,40%
4	Valider un semestre, une année ou un di...	4.684	77,40%	744	12,30%	628	10,40%
Finalités pour les étudiants							
	Pour les étudiantes et étudiants, l'évaluation sert à						
5	Se motiver pour apprendre	2.851	49,30%	1.180	20,40%	1754	30,40%
6	Améliorer leurs apprentissages	2.747	47,50%	1.288	22,30%	1749	30,20%
7	Prendre conscience de leur niveau	3.561	61,60%	978	16,90%	1245	21,50%
8	Organiser leur temps et leur effort de travail	3.168	54,80%	1.253	21,70%	1362	23,60%
Finalités pour les enseignants							
	Pour les enseignantes et enseignants, l'évaluation sert à						
9	Contrôler les étudiantes et étudiants	4.139	71,60%	872	15,10%	771	13,30%
10	Améliorer leurs cours	2.512	43,50%	1.169	20,20%	2.101	36,40%
11	Sélectionner les meilleures et meilleurs	2.823	48,80%	1.094	18,90%	1.865	32,30%
12	Sanctionner les étudiantes et étudiants	1.646	28,40%	1.353	23,40%	2.784	48,10%
Position face à l'évaluation							
	Positionnez-vous face aux différentes opinions qui vont défiler						
13	Les évaluations sont utiles pour les enseignants	3.456	60,80%	1.350	23,70%	881	15,50%
14	Les évaluations sont utiles pour moi	3.096	54,50%	1.494	26,30%	1.096	19,30%
15	Généralement, les évaluations m'incitent à apprendre	3.322	58,40%	804	14,10%	1.561	27,50%
16	On devrait supprimer les évaluations à l'université	956	16,80%	1.587	27,90%	3.143	55,30%
17	Les évaluations me rendent souvent nerveux ou nerveuse	4.665	82,00%	497	8,70%	524	9,30%
18	Je pense que les évaluations sont susceptibles de me nuire	1.876	33,00%	1.609	28,30%	2.201	38,70%
19	La préparation des évaluations me demande toujours un travail excessif	3.447	60,60%	1.258	22,10%	982	17,30%
20	À mon avis, les évaluations traitent tous les étudiants de façon équitable	1.588	27,90%	999	17,60%	3.099	54,50%
21	La préparation des évaluations est une tâche difficile pour moi	2.840	49,90%	1.539	27,10%	1.309	23,00%
22	Ce que je souhaite décrire en répondant aux items suivants est basé sur : mon expérience en LICENCE à l'université de Bordeaux (que je sois étudiant de licence ou déjà en master)	mon expérience en MASTER à l'université de Bordeaux (sans faire référence à mon expérience de licence)					

		Accord		Ni accord ni désaccord		Pas d'accord	
Objet évalué							
	À l'université de Bordeaux, je suis évaluée ou évalué sur						
23	les connaissances théoriques données lors des enseignements	4.682	90,40%	251	4,80%	246	4,70%
24	ce que je suis capable de faire : habiletés techniques, utilisation d'instruments...	2.524	48,70%	782	15,10%	1.873	36,20%
25	les attitudes ou sur les valeurs que je porte	602	11,60%	808	15,60%	3.769	72,80%
26	mes capacités à appliquer des savoirs en situations (ou cas similaires à ceux que je rencontrerai dans ma vie professionnelle future)	2.047	39,50%	996	19,20%	2.136	41,20%
Quand évalue t-on							
	À l'université de Bordeaux,						
27	au début d'un enseignement, le professeur réalise souvent l'évaluation (diagnostique) de ses étudiants	340	6,60%	847	16,40%	3.992	77,10%
28	l'évaluation a lieu uniquement à la fin du processus d'apprentissage	3.438	66,40%	705	13,60%	1.036	20,00%
29	mon apprentissage est le plus souvent évalué continuellement durant l'enseignement	1.373	26,50%	1.069	20,60%	2.737	52,90%
Qui évalue							
30	en tant qu'étudiante ou étudiant, j'évalue le travail de mes camarades (pairs)	890	17,20%	843	16,30%	3.446	66,50%
31	je suis évaluée ou évalué par mes camarades (pairs)	821	15,80%	823	15,90%	3.535	68,30%
32	j'autoévalue mes apprentissages	2.200	42,50%	886	17,10%	2.093	40,40%
33	des personnes externes (professionnels...) évaluent mes apprentissages	1.971	38,10%	784	15,10%	2.424	46,80%
Qui élabore les évaluations							
34	les règles et les modalités d'évaluation sont claires	2.434	47,00%	1.026	19,80%	1.719	33,10%
35	je trouve que les évaluations correspondent à ce que j'ai réellement appris (les sujets des évaluations ont été traités en cours et en TD)	2.312	44,60%	1.358	26,20%	1.509	29,20%
36	je collabore avec les enseignants pour définir le système d'évaluation qui sera appliqué (méthodes, moments, procédé de qualification, etc.)	793	15,30%	830	16,00%	3.556	68,60%
37	je suis consultée ou consulté sur le système d'évaluation que je préfère	291	5,70%	544	10,50%	4.344	83,90%
Méthodes d'évaluation							
38	l'examen écrit est la principale approche d'évaluation de l'apprentissage	3.973	77,70%	484	9,50%	655	12,80%
39	l'évaluation repose sur une diversité d'approches (examen, exposé oral, travail de recherche, projet individuel/ de groupe...)	2.683	52,40%	783	15,30%	1.646	32,20%

		Accord		Ni accord ni désaccord		Pas d'accord	
40	j'ai la possibilité de choisir entre différentes approches pour être évaluée ou évalué	206	4,00%	335	6,60%	4.571	89,40%
41	les épreuves d'évaluation sont similaires aux activités réalisées en cours	2.016	39,50%	1.545	30,20%	1.551	30,30%
Critères de notation							
42	Depuis le début des cours, je connais les critères d'évaluation qui vont être utilisés	2.037	40,00%	1.075	21,10%	1.977	38,90%
43	Il est facile pour moi de comprendre les critères d'évaluation présentés dans chaque enseignement	1.865	36,60%	1.229	24,20%	1.995	39,20%
44	Les étudiants participent à la définition des critères d'évaluation	184	3,60%	402	7,90%	4.503	88,50%
45	Je connais les critères pour valider une unité d'enseignement (UE)	2.967	58,30%	952	18,70%	1.170	23,00%
L'après-évaluation							
46	On me permet de connaître les résultats de l'évaluation assez rapidement	895	17,70%	772	15,30%	3.388	67,00%
47	La publication des résultats est le principal moyen utilisé par le professeur pour m'informer des évaluations que j'ai passées	4.016	79,40%	586	11,60%	453	8,90%
48	Je peux facilement consulter mes travaux réalisés lors des évaluations	813	16,10%	1.135	22,50%	3.107	61,40%
49	Les retours d'évaluation qui me sont faits m'informent de mes erreurs ou de mes lacunes dans les apprentissages	1.137	22,50%	891	17,60%	3.027	59,90%
50	Les professeurs m'invitent à réfléchir sur les résultats obtenus lors de l'évaluation	849	16,80%	985	19,50%	3.220	63,70%
51	L'évaluation est suivie de recommandations pour améliorer mon apprentissage	651	12,90%	871	17,20%	3.532	69,90%
52	En ayant connaissance des résultats de l'évaluation, j'essaie de corriger les possibles lacunes ou difficultés	3.370	66,70%	926	18,30%	757	14,90%

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Fostering Enquiry and Conversations in Teaching: 'Backstage' approach to educational development

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Abstract

At King's College London (KCL), our staff development programme for newly-appointed teaching staff replaced a traditional programme in October 2018. The foundation for the new programme rests on recent work in academic development (Kenny, Chick *et al.,* 2017) and the responsibilities that encompass what it means to be an educator at KCL. While the core focus is on student-centred teaching and learning, other responsibilities such as personal tutoring, mentorship, and increasing educational leadership opportunities necessitate additional conversations essential to being an educator. The programme occurs in three parts: 1) Part I is a pedagogical seminar series; 2) Part II is an opportunity to apply small interventions to teaching, to investigate those interventions and to reflect on what happened as an initiation into SoTL; and 3) in the final part, participants will apply for Fellowship of the United Kingdom Higher Education Academy. The premise for this programme stems from research on productive conversations around academic practice where there is an intellectual approach to 'idea testing' and an established culture of trust (Roxå, T. & Mårtensson, K., 2009; Roche, V., 2001). This task experimentation phase in Part II is time for participants to complete these tasks independently within a continued support framework. Part II concludes with an 'exit session' where participants bring documentation of their tasks in order to engage in a scholarly peer review process of what happened, what worked, where to improve, and next steps (Brookfield, 2017; Bernstein, 2008; Kreber, C., 2002; Felten, P., 2013). By the time of the EuroSoTL conference we will have had 150 academic staff go through this programme with 80 participating in Part II of the programme focused on SoTL. In this presentation, we will give a brief overview of the rationale of the programme in addition to initial findings from the first year. Based on these initial findings, we will engage our participants in our lessons learnt on our approach to professional development as well as thinking about the advantages and drawbacks to our approach.

1. Introduction

The Learning and Teaching Programme is the main professional development programme available at King's College London (KCL) for those with teaching responsibilities in their contracts. King's Academy, the educational development unit at KCL, designed and developed this new programme. It is a compulsory programme intended to benefit newly-appointed staff who hold a range of experience in higher education. The programme occurs in three parts: 1) Part I is a seminar series on core knowledge surrounding what it means to teach at KCL and within the higher education sector; 2) Part II is an opportunity to apply independently various strategies to support learning and teaching; and 3) in the final part, participants will apply for Fellowship of the Higher Education Academy. This is the portable qualification recognised nationally and internationally.

1.1. Programme Context: Needs Analysis & Research

The impetus for the development of the new programme was to replace the traditional credit-bearing Postgraduate Certificate in Academic Practice (PGCAP). Concerns over the

programme with multiple written assessments and intensive time demands across three terms included whether it was fit-for-purpose in an institution serving 27,000 students and 4500 teaching staff. As a research-intensive institution, teaching responsibilities are often seen as second to research commitments due to issues regarding recognition, promotion, and most importantly, time.

Within this complicated context, King's Academy conducted a needs analysis with invested members of KCL community to determine how a new programme could meet various needs and expectations. We analysed the current existing educational development provision, as well as feedback from participants on that programme; we gathered feedback from Vice-Deans of Education and Vice President/Principal of Education. We also consulted external peer institutions such as University College London (UCL) and Oxford University who were also in the midst of redesigning their own non-accredited programmes.

In January 2018, the Associate Directors for King's Academy met with Vice Deans of Education in small focus groups to discuss their needs for this new programme. Collective, identified needs from these focus groups were:

— **Focus on community of engagement:** *'It should be about joining the King's community;' 'Becoming a member of a community should be more important.'*
— **Intentional practices:** *'High quality teaching interventions – aimed at the different career stages;' 'Training needs to be meaningful to staff and practical, direct skills they will use.'*
— **Scholarly approaches:** *"Collect evidence of own good practice and marker/goals along the way".*

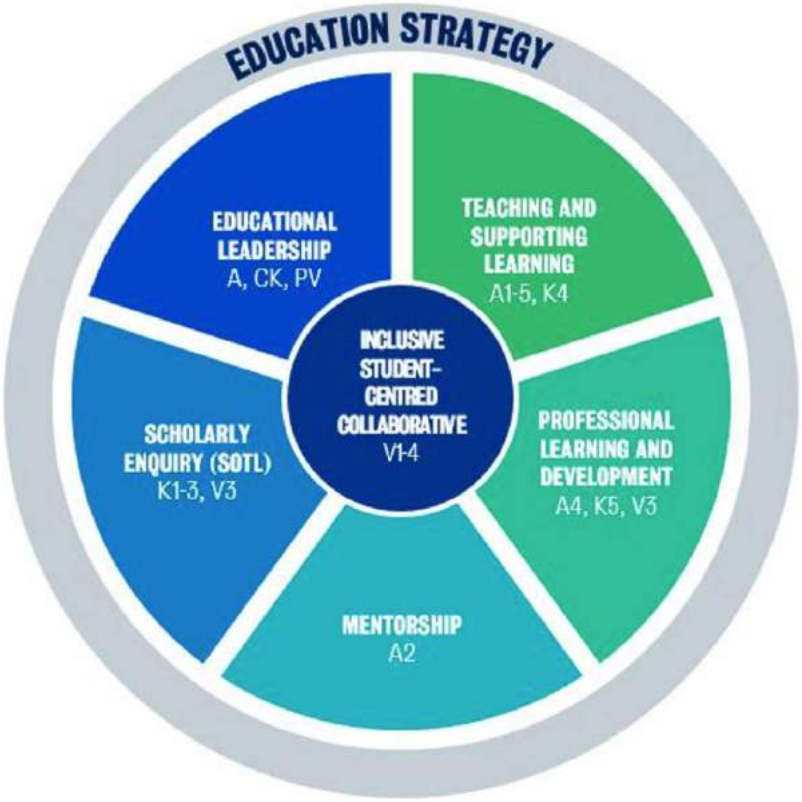
At the time of the needs assessment (2018), the Associate Director (author) was also teaching the last module of the PGCAP. Therefore, she tasked the participants to design a new programme using research-based evidence on curriculum design (Ambrose *et al.*, 2012). Working in small teams, the participants designed learning outcomes and peer group discussions as the core activities. The main themes taken across their designs were to:

— Maintain ***peer review of teaching*** opportunities in programme.
— Focus on ***community*** of engagement and support (similar to Vice Deans' sentiment).
— Recognise anxiety among some staff regarding ***NOT knowing pedagogic research.***

Finally, both the senior administration and the participants in the programme indicated the need for a programme to be able to develop confidence to do things differently and to take educational risks. In an email, one PGCAP graduate wrote to the Associate Director regarding her approach to pedagogical training, 'It's introduced new ways of thinking about teaching I hadn't considered before. In turn, it's given me the confidence to experiment. If they do not work I can always try something else next time.' This reception towards updated methods for academic development indicated that our potential audience for the programme needed explicit support and encouragement around taking small steps to change one's teaching practice.

Coupled with the needs analysis, we gathered relevant literature regarding professional development programmes in similar-sized institutions. UCL replaced their PGCAP for a more flexible development programme in 2014. Oxford's programme is noncompulsory yet takes place across one year. Concurrently, University of Calgary published work on their teaching expertise development framework (Kenny, N., Chick, N. *et al.*, 2017). This framework encapsulated much of what the needs analysis conversations indicated in terms of hopes and needs for King's educators.

Figure 1
Learning and Teaching Programme Educational Development Framework



In Figure 1, each aspect is mapped to the standards of the AdvanceHE/Higher Education Academy UK Professional Standards Framework (Activities, Core Knowledge, and Professional Values) that participants will revisit in their culminating HEA Fellowship application. Therefore, using this framework as a definition of what our programme attends to in terms of how to approach one's work in teaching and learning provided a starting point for the design of our programme.

1.2. Design of the LTP

The needs analysis led the articulation of our aims for the design of the programme to support a community dedicated to discussing, developing and reflecting on pedagogy using relevant pedagogical literature within a more flexible structure. Furthermore, we wished to allocate time and space for structured experimentation and reflection through supporting backstage conversations within a formal programme as a form of initiation into talking about teaching within King's. The programme consists of the three parts described below.

Part *I. LTP seminar series*

The series of eight seminars models a backward curriculum design approach. First, participants are prompted to revive their transcendental goals ("What do you want your students to know or be able to do in 20 years' time?" (Lang, 2018)). In the following session

they operationalise these as learning outcomes for which they later design assessments". Articulating learning outcomes, designing assessments (Jessop, T., El Hakim, Y., & Gibbs, G., 2014), providing feedback, and linking activities form the main thematic sessions of teaching and supporting learning (Fink, 2013). Enhancing these themes includes King's-specific considerations represented in the King's Education Strategy around research-enhanced teaching, interdisciplinarity, personal tutoring and mentorship, learning environments, and evaluation of individual practices. Each seminar foregrounds relevant pedagogical research (Ambrose, S. *et al.*, 2010; Freeman, S. *et al.*, 2014;) as well as an active modelling of a range of strategies on the part of the facilitators to demonstrate their purpose and use. We use our institution's virtual learning environment (VLE) to support the work undertaken within Part I and we model the use of various functionalities within the VLE each week.

Our seminar cohorts are interdisciplinary serving as an opportunity to illustrate and to reveal disciplinary differences as a form of promoting explicit rationales of epistemologies and practices within conversations. For each term, we have 40-60 participants enrol into part I. They are then allocated into smaller seminar groups of 20 facilitated by two senior teaching fellows from King's Academy. In addition to the expertise provided in facilitating these seminars, the senior teaching fellows are active liaisons across all nine of King's Faculties consulting and supporting a range of academic staff. They are positioned to use this contextual knowledge to connect LTP participants to relevant educational or SoTL projects within the institution thus increasing the potential for networked conversations around teaching and learning.

Part *II. Independent application of development activities*

The premise for this part of the programme connects directly to the literature on productive conversations around academic practice where there is an intellectual approach to 'idea testing' and an established culture of trust (Roxå, T. & Mårtensson, K., 2009; Rienties, B. and Hosein, A., 2015; Roche, V., 2001). This task experimentation phase offers time for participants to complete these tasks independently within a continued support framework. This part of the programme is a flexible, blended learning experience. Two compulsory meetings occur during this term: one as an entry session to review key questions they wish to explore and the methods or activities that will support these questions; the last session known as the 'exit' session ask participants to share one of their activities within small groups to receive peer feedback.

In the entry session, participants can select from a range of activities (Table 1) listed within our web site below including implementing group work (teaching and supporting learning), conducting a brief literature review of three articles on disciplinary-based practices (scholarly enquiry), or facilitating a graduate teaching assistant microteaching session in her/ his department (mentorship). From our inaugural cohort, this is an example of the range of activities undertaken between January and March 2019:

Throughout the term, King's Academy supported the reflection of these activities within a structured reflection document shared online. This helped staff keep track of progress as well as attend to any questions participants might have had. This explicit documentation is meant to support what is asked of participants to bring to the exit sessions.

Table 1
Examples of Activities undertaken by LTP participants

Identifying threshold concepts in discipline	Pre-surveys for prior knowledge	Extended group projects
Critical incident questionnaires	Midterm feedback session	Documentation of personal tutoring meetings to track questions asked
Formative feedback for essays	Using screencasts for giving feedback	Using exemplars
Designing new modules	Exit tickets for seminars	Peer observations
Interactive cover sheets	Interviewing students from previous courses	Interviewing senior colleagues in department

In the exit sessions, participants bring this documentation of their tasks in order to engage in a scholarly peer review process of what happened, what worked, where to improve, and next steps (Brookfield, 2017; Bernstein, 2008; Kreber, C., 2002; Felten, P., 2013). The participants form small groups facilitated by members of King's Educators Network, a network of 300 engaged educators willing to provide feedback to LTP participants on their small teaching projects. Bringing established senior staff as facilitators of this exit session invigorates contact with new colleagues and serves to support conversations among people who might not have occasion to meet in any other way. Figure 2 represents an image from one of these lively exit sessions.

Figura 2
Learning and Teaching Programme Exit Session

Following the exit session, King's Academy staff encourage participants' first steps in publicly disseminating these projects through King's internal education conference or an invitation to contribute their case studies to institution-wide resources.

In our inaugural cohort in October 2018, one of our participants asked, *"Where are we supposed to talk about teaching and learning at King's?"* This question forms the need for Part II within this institutional context to provide structure time and space to simulate backstage conversations as a stepping stone to developing networks for talking about teaching more within corridors, department meetings, or everyday encounters.

Part *III. Completion of Advance HE/Higher Education Academy Fellowship Application Process*

King's Academy is accredited by Advance HE/Higher Education Academy (AdvanceHE, 2019) to award Fellowships in teaching and learning. In the most recent reaccreditation process completed in December 2018, the reviewers commented on LTP and its connection to supporting academic practice, *'The Learning and Teaching Programme provides opportunities for individuals to develop research-informed, practical approaches to learning, teaching and supporting students and to work towards their HEA Fellowship application in a flexible timeframe to suit their practice and experience.'*

Parts I and II of LTP contribute to the participants' process for applying for the HEA Fellowship. In the traditional PGCAP programme, participants received HEA Fellowship automatically. LTP prepares participants to apply for the HEA Fellowship independently and on their own schedule. Programme participants receive additional support for their application via King's accredited HEA programme replete with writing workshops and writing 'retreats' or devoted time and space to complete the application.

2. Initial Findings

The evaluation plan for this programme consists of pre-surveys prior to the start of Part I; midterm feedback during Part I; post-survey once Parts I and II completed.

In each Part I to date, we have conducted a midterm feedback exercise publicly using polling software. Participants submitted anonymous responses to a few question prompts (e.g. Stop-Start-Continue), and upvote or downvote each other's responses. This meant that they carried out much of the data analysis themselves, yielding rapid and profound insights about consensus and splits.

The public nature of this exercise is exposing but exhilarating for the facilitators, and intensely interesting for participants. Insights so far have included confirmation that the small group discussions are valuable, along with an unexpected endorsement of some of our VLE experiments. Time pressures were identified as biggest barrier to fully engaging with the seminars and in particular, the minimal reading asked of them to contribute to group discussions.

Based on the final evaluations of our first cohort from October 2018 (n = 33), the seminar sessions they most appreciated were Microteaching, Feedback Practices, Active Learning, and Assessment Approaches. Qualitative comments included:

— *"The LTP has been totally different to what I imagined - much more philosophical and very thought provoking, so thank you!"*
— *"I also felt that I took away some valuable insights from this course. First, the idea that teaching is a research activity in its own right, i.e., best practice/what works. That really spoke to my*

> *unarticulated style. Second, the assessment for learning was really thought provoking. I have spent many years moaning about students only bothering with essays/grades and being so instrumental in their learning. Then I realised the curriculum (and hence me!) was part of the problem. Now I know the problem, I can hopefully get a proper solution. So, many thanks!"*

Whilst we're representing some of the more positive feedback, we received constructive, critical feedback. Participants commented on the persistent dilemma between balance of theory and practice; for lecturers at earlier stages of their career requested more guidance on classroom management; and there were numerous comments about wanting to know specifically about how to structure instructional time. Some participants disclosed that they had felt disoriented by the backward design curriculum approach and had expected a more practical focus on techniques. "Things began to come together" for them in the seminar on assessment design when they began to apply their conceptual groundwork and recognise its value.

At the time of EUROSoTL 2019, we have completed one iteration of Part II. Participants completed plans for at least two activities, carried them out, and chose one to present to small groups of peers in their Exit Session. Each group included an invited guest who is an experienced educator in a senior role at King's or a counterpart from other universities (UCL and London School of Economics). This outside attention intended to signal to participants that their work is important and valued beyond the programme. The senior, experienced educators indicated in their feedback they found the exit sessions very useful; one colleague wrote, *"I very much enjoyed this. Seeing how different disciplines have problems similar to those that I have, helped me understand my own challenges better, too."*

Coupling this feedback with the Part I feedback, it is clear that having the time and space for developmental, peer review of teaching practices is what LTP affords. As well as a potential support network for colleagues new to King's it also models the kind of belonging we hope to foster among students.

3. Summary

During the first term of this programme, one participant entered the room, we greeted her, she replied, "it is so nice to come to these sessions and have someone know your name." This participant had initially been one of our most resistant colleagues yet by the end of the programme she felt included and valued. As mentioned previously, King's College London is a massive, research-intensive institution. It can be very easy to remain in one's silo never to meet another person from across the river Thames. Not only does our initial feedback indicate some degree of quality to our programme, our efforts to support backstage conversations within a somewhat formal structure have unintended effects related to belonging, identity, recognition, and advocacy. Each participant in LTP holds more than one responsibility represented in Figure 1; academics are increasingly asked to do more without proper recognition. If this programme contributes to one person's sense of being seen and appreciated for her/his/their work within this large university, then we have achieved more than we originally intended.

Acknowledgements

This entire programme would not be possible if not for the tireless dedication and bravery of our colleagues in King's Academy who worked to establish this programme with very few resources.

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El Debate Universitario Guiado: una nueva herramienta docente que propicia el aprendizaje profundo y significativo

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Abstract

The education of future nursing professionals needs to incorporate the competencies established by Tuning Educational Structures in Europe and the Reference Points for the Design and Delivery of Degree Programmes in Nursing, both of which are reference guides in Europe. This necessity is making the educators question the way in which the teaching-learning processes take place in Higher Education. As we celebrate the 20th anniversary of The Bologna Declaration, we also continue to wonder if the education of future professionals enables them to respond to future challenges. In line with this background, the main aim of this paper is to present an innovative teaching method among active methodologies: Guided University Debate.

Besides describing the basis of Guided University Debate, the value of this teaching method within the Nursing Degree is justified based on the research results achieved after its implementation. First of all, the teaching-learning sequence for Guided University Debate is described. This sequence was implemented during the 2018-19 academic year among first year Nursing Degree students in the subject "Structure and Function of the Human Body II". Second of all, we point out several reflections following our experience with Guided University Debate.

Keywords: Guided university debate; innovation; teaching method; health sciences; Nursing Education Research.

Resumen

La necesidad de formar a futuros profesionales de Enfermería en las competencias establecidas por los dos informes referentes en Europa; Tuning Educational Structures in Europe y el Reference Points for the Design and Delivery of Degree Programmes in Nursing, ha conducido a los docentes a cuestionarse la forma en la que se producían los procesos de enseñanza y aprendizaje. Sin embargo, en el año en el que se cumple el 20º aniversario de la Declaración de Bolonia, continuamos preguntándonos si estamos educando al alumnado de manera que pueda responder a los futuros retos. En este contexto, el objetivo principal de este trabajo es presentar una herramienta docente que promueve el papel activo del alumnado: el Debate Universitario Guiado.

Es por lo que además de describir el Debate Universitario Guiado se justifica su utilización como herramienta docente en el Grado de Enfermería, tomando como referencia los resultados de la investigación en la implementación de este método. Para ello, en primer lugar, se describe la secuencia de enseñanza-aprendizaje basado en el Debate Universitario Guiado implementada durante el curso 2018-19 en primero de Grado de Enfermería en la asignatura de "Estructura y función del cuerpo humano II". Y, en segundo lugar, se señalan algunas reflexiones tras la experiencia.

Palabras claves: Debate Universitario Guiado; innovación educativa; metodología docente; ciencias de la salud; investigación en educación en enfermería.

1. Introducción

La necesidad de formar a las futuras enfermeras y enfermeros en las competencias establecidas por los dos informes referentes en Europa; Tuning Educational Structures in Europe (González y Wagenaar, 2008) y el Reference Points for the Design and Delivery of Degree Programmes in Nursing (Gobbi *et al.*, 2011), han conducido a los docentes a cuestionarse las formas en las que se producían los procesos de enseñanza y aprendizaje. Sin embargo, en el año en el que se cumple el 20º aniversario de la Declaración de Bolonia, continuamos preguntándonos si estamos educando al alumnado de manera que pueda responder a los futuros retos (Popil, 2011; Rodríguez-Borrego *et al.*, 2014; González-Chordá y Maciá-Soler, 2015).

La búsqueda de formas alternativas de organizar la enseñanza universitaria en el ámbito específico de la Innovación Docente en Enfermería, ha conducido al desarrollo de diferentes metodologías (Simulation Exercises, Problem Based Learning, Case Method, role plays, e-learning, etc.) (Crookes *et al.*, 2013; Forsberg *et al.*, 2014; Arrue y Caballero, 2015; Aglen, 2016; Betihavas *et al.*, 2016). No obstante, pese al abanico de metodologías docentes existentes, no resulta fácil escoger e implementar las que mejor se adaptan al contexto de cada grado y centro. Entre otros obstáculos, las estrategias educativas, en muchas ocasiones, no se encuentran suficientemente descritas y los diseños de enseñanza no suelen estar basados en evidencias (National League for Nursing, 2012).

Es precisamente en esta área de la innovación educativa donde Mérida *et al.* (2016) han propuesto el Debate Universitario Guiado (DUG en adelante) una versión adaptada al aula del debate universitario de competición (Edwards, 2008). Estos autores abogan por la implementación de esta prometedora herramienta docente que tiene el potencial de trabajar la mayoría de las competencias establecidas por los dos informes Tunning referentes en Europa (González y Wagenaar, 2008; Gobbi *et al.*, 2011).

Sin embargo, la mejora de la calidad de los procesos de enseñanza-aprendizaje no sólo requieren de la implementación en el aula sino también de la evaluación de las estrategias docentes (Lambert, 2012; González-Chordá y Maciá-Soler, 2015; Betihavas *et al.*, 2016). Es por esto que el grupo BaNER (Basque Nurse Education Research Group) promueve proyectos dirigidos a mejorar el aprendizaje del alumnado de Enfermería diseñando, implementando, evaluando y divulgando metodologías activas en general, y el DUG en particular (BaNER, 2019).

En este contexto, el objetivo principal de este trabajo es dar a conocer nuestra experiencia con el DUG. Para ello, en primer lugar, se describe la ejecución de la secuencia de enseñanza-aprendizaje basado en el Debate Universitario Guiado implementada durante el curso 2018-19 en primero de Grado de Enfermería en la asignatura de "Estructura y función del cuerpo humano II". Y, en segundo lugar, se señalan algunas reflexiones tras la experiencia.

2. Ejecución de una secuencia de enseñanza-aprendizaje basado en el Dug

La descripción de la ejecución de la secuencia de enseñanza-aprendizaje requiere de, en primer lugar, la especificación de la integración del DUG en el currículum de la asignatura y, en segundo lugar, de la explicación de la propia implementación. A continuación, se describen ambos procesos.

2.1. Integración del Debate Universitario Guiado en el currículum

El primer paso comenzó con la integración del DUG en el curso (Gould *et al.*, 2015). Para ello se seleccionaron de la asignatura "Estructura y Función del Cuerpo Humano II" las competencias y los resultados de aprendizajes (RA, en adelante) que se trabajarían mediante esta metodología (*Tabla 1*).

Tabla 1
Competencias específicas y transversales
relacionadas con los resultados de aprendizaje trabajados mediante el DUG

Competencias específicas (CE) y Resultados de aprendizaje (RA)	
CE.1 Distinguir la estructura atómica y molecular de los principales compuestos orgánicos del cuerpo humano para comprender los efectos que tienen sus modificaciones en la salud. **CE.2** Relacionar las principales vías metabólicas celulares para interpretar el estado fisiológico concreto del individuo.	**RA.1** Describir la estructura y función de las siguientes moléculas orgánicas: carbohidratos, lípidos y proteínas. **RA.2** Identificar los diferentes procesos enzimáticos durante la digestión y absorción de carbohidratos, lípidos y proteínas. **RA.3** Identificar y entender los diferentes tipos de metabolismo, así como las etapas en las que se subdivide.
CE.3 Identificar adecuadamente las diferentes fuentes energéticas alimentarias para conseguir una ingesta nutricional equilibrada y segura para la salud según el estado fisiológico del individuo.	**RA.4** Localizar los diferentes grupos de alimentos que contienen los nutrientes esenciales. **RA.5** Conocer las recomendaciones dietéticas recomendadas para la población en general.

Tras la selección de las competencias y los resultados de aprendizaje (*Tabla 1*), se diseñaron y validaron el escenario, una pregunta principal de debate y siete preguntas detonantes para trabajar la integración del metabolismo celular mediante el DUG (*tabla 2*).

El objetivo principal de la implementación del DUG fue, lógicamente, la adquisición de las competencias establecidas para la asignatura de "Estructura y función del cuerpo humano II" y precisamente, con el objetivo de medir los resultados de aprendizaje tras la aplicación del DUG, se diseñó un estudio cuasi-experimental (Cohen *et al.*, 2011), con un pre-test y un post-test para medir la mejora de los resultados de aprendizaje, tratando de superar la mera percepción de los estudiantes mediante los coloquialmente llamados *happy-sheets* (Lambert, 2012; Betihavas *et al.*, 2016). El alumnado resolvió dos pruebas con sus correspondientes actividades, uno antes (pre-test) y otro después (post-test) del debate. Ambas pruebas abordaban el tema de la integración del metabolismo celular y medían los mismos resultados de aprendizaje.

En relación a las consideraciones éticas de los análisis que se están realizando, decir que el Comité de Ética de la Universidad del País Vasco / Euskal Herriko Unibertsitatea aprobó la realización de este estudio (NoRefCEID: M10/2017/043).

Una vez elaborado el escenario para el Debate, determinado cuáles iban a ser las actividades que íbamos a hacer con los estudiantes y cómo se evaluarían, se pasó a la fase de implementación.

Tabla 2
Escenario, pregunta del debate y preguntas detonantes (PD) para trabajar durante el proceso

Escenario: "Sara tiene sobrepeso y está muy preocupada con ese tema. No acaba de entender, por qué le cuesta bajar esos "kilitos de más" cuando ella se cuida bastante su dieta. Se trata de una dieta basada en grasas mono y poliinsaturadas evitando las grasas saturadas, un mayor consumo de proteínas animales que vegetales, un mayor consumo de carbohidratos complejos que simples y mayor fibra. También suele beber Danacol® para disminuir su nivel de colesterol. Incluso, a veces, hace días de ayuno para ver si consigue bajar su peso. También ha probado unas pastillas que, según la de la tienda de dietética, contiene Carnitina, lo que al parecer le va a ayudar a "quemar las grasas".	
Pregunta principal de debate: ¿Conseguirá Sara disminuir su peso corporal de manera saludable siguiendo su dieta?	
PD.1	¿El consumo de carbohidratos complejos es adecuado para disminuir los depósitos de grasa corporales?
PD.2	¿El consumo de grasas monoinsaturadas y poliinsaturadas ayuda a disminuir el nivel de grasa corporal?
PD.3	¿Tomar productos enriquecidos como el Danacol® es adecuado para su problema?
PD.4	¿El consumo de proteínas animales es más adecuado que consumir proteínas vegetales para disminuir su peso corporal de manera saludable?
PD.5	¿La ingesta de carnitina ayuda a quemar grasas?
PD.6	¿Existe relación entre la acumulación de grasa corporal y el aumento de colesterol sanguíneo?
PD.7	¿Es adecuado la práctica del ayuno para aumentar quemar las grasas?

2.2. Implementación en el aula

La implementación fue realizada con estudiantes de Grado de Enfermería de primer año universitario (n = 145) matriculados en la asignatura "Estructura y función del cuerpo humano II" de la Universidad del País Vasco (UPV/EHU) en Leioa.

Para trabajar el tema específico de la integración del metabolismo celular cada alumno utilizó 10 horas de trabajo presencial (clase no expositiva grupal) y el mismo número de horas de trabajo no presencial. La dinámica fue desarrollada por docentes con experiencia previa en el uso de esta metodología docente en la materia del Departamento de Enfermería (Mérida *et al.*, 2016) y un coordinador de Debate de la Universidad. Las fases que forman este proceso se presentan de forma sintética en la *Tabla 3*.

Como se observa en la *Tabla 3*, en la primera fase se presenta la dinámica, exponiéndose en el aula los objetivos que se querían trabajar, la dinámica de las sesiones y el sistema de evaluación. Asimismo, siguiendo las recomendaciones para formar grupos de trabajo colaborativo, se conformaron equipos de 4 alumnos de manera aleatoria (Eastridge, 2014). Resultando un total de 18 equipos para la elaboración de este estudio.

Tabla 3
Fases, tiempo empleado y modalidad docente durante la implementación del DUG

Fases	Tiempo	Modalidad
1. Presentación de DUG y el escenario a trabajar	1 h 30 min	Clase expositiva
2. Trabajo grupal semanal	7 semanas	No presencial
3. Debate en el aula	30 min cada debate	Presencial
4. Feedback	30 min	Presencial

Al igual que en el Debate de competición, en el DUG el punto de partida es una cuestión planteada en forma de pregunta cerrada que sólo puede ser respondida mediante una afirmación o una negación (*Tabla 2*). Cada equipo trabajó los argumentos para poder defender ambas posturas ("a favor" y "en contra"), ya que hasta el día del debate no conocieron la posición que debían apoyar. La posición que cada equipo debía defender se asignó de manera aleatoria al inicio de la sesión de debate.

Una vez planteada la pregunta principal "¿Conseguirá Sara disminuir su peso corporal de manera saludable siguiendo su dieta?", el alumnado prosiguió con el análisis de la misma. Los equipos se reunieron para examinar la pregunta, analizar el conocimiento existente, distinguir el conocimiento que debían buscar, además de plantear los objetivos para la siguiente semana.

La segunda fase del proceso de desarrolló de forma no presencial. Cada equipo debía hacerse responsable de su propio proceso de aprendizaje. Sin embargo, con el objetivo de facilitar y orientar en el proceso, se elaboraron una serie de preguntas detonantes (*Tabla 2*). Las preguntas detonantes sirvieron para que los estudiantes fueran adquiriendo de manera gradual la competencia de razonar, cometiendo errores y experimentando en un entorno seguro (Kuehster y Hall, 2010). Las preguntas fueron entregadas a los equipos de manera progresiva en el tiempo. Para cada pregunta detonante a cada equipo se le exigió, al menos, un argumento a favor y otro en contra. Mediante este proceso el docente se aseguró de que cada equipo había reunido el material suficiente y argumentos para cada postura.

Para finalizar la segunda fase (no presencial), los integrantes de cada equipo se asignaron entre sí los roles que cada uno iba a protagonizar durante el debate (introductor, primer refutador, segundo refutador y conclusor). De esta manera todos los estudiantes, sin excepción, participaron en el debate. En la *Tabla 4* se muestra un ejemplo de las características de cada rol.

El Debate se planteó en la última semana de clase para dar tiempo al alumnado a integrar los nuevos conceptos adquiridos, a preparar los argumentos para su defensa el día del debate y a su posterior presentación. Todos los equipos tuvieron que traer los argumentos "a favor" y "en contra" que respondieran a la pregunta del debate preparados para su defensa el día del debate, utilizando para ello los argumentos previamente trabajados a través de las preguntas detonantes. Minutos antes del inicio del debate, se sorteó la postura que cada equipo defendería. Posteriormente, el debate se desarrolló por turnos, enfrentándose dos equipos cada vez. Cada debate tuvo una duración total de 20 minutos.

Al mismo tiempo que los dos equipos se enfrentaban, un jurado (constituido en este caso por la docente de la asignatura, dos expertos en debate universitario y los alumnos) evaluó las intervenciones en base a una rúbrica. Dicha rúbrica recogía aspectos como: la calidad argumental, las evidencias aportadas, el trabajo en equipo etc. (Villa y Pobletes, 2007).

Tabla 4
Fases, tiempos y roles establecidos para la realización del Debate Universitario (DUG)

Fases del Debate	Tiempo estimado	Roles por equipo
Turno de introducción Presentación de los miembros del equipo y de los argumentos que va a defender el equipo.	2 min por posición	Introductor (1 persona)
Primer turno de refutación Desarrollar los argumentos propios del equipo y responder a las preguntas planteadas por el equipo contrario.	3 min por posición	
Segundo turno de refutación Desarrollar los argumentos propios del equipo y responder a las preguntas planteadas por el equipo contrario.	3 min por posición	Refutadores (2 personas)
Turno de conclusión Sintetizar el debate: defender los argumentos presentados por su equipo y presentar las debilidades de los argumentos del equipo contrario.	2 min por posición	Conclusor (1 persona)

El proceso del DUG finalizó con una cuarta fase de feedback. En esta fase los docentes presentaron sus reflexiones a los alumnos tanto sobre el proceso de preparación como del propio debate. Los trabajos son una actividad de desarrollo, y por lo tanto el alumnado debe recibir feedback sobre su formación y rendimiento. Proveer de feedback a los estudiantes les posibilita saber a cerca de su progreso, sus fortalezas y debilidades, así como poder sugerirles áreas de mejora. Es entonces cuando el alumnado tendrá la oportunidad de pensar sobre ello, y tal vez discutir sus puntos de vista con el docente antes de usar esta información en su proceso de aprendizaje.

3. Reflexiones tras la experiencia de implementación universitaria en el curso 2018-19 en grado de Enfermería

A continuación, se comentan brevemente algunas reflexiones sobre el proceso de aprendizaje durante la implementación del DUG en el Grado de Enfermería del curso 2018-19.

Se deben tener en cuenta ciertos aspectos previos al día del debate, como son la carga de trabajo del alumnado y la orientación continua por parte del profesorado.

Resulta indispensable calcular de manera rigurosa la carga de trabajo no presencial y/o sus tareas. El alumnado puede no disponer del tiempo necesario para realizarlas cuando son excesivas y esto iría en detrimento del aprendizaje.

Debido a que hay que exigirles esfuerzo, pero dándoles soporte y orientación para llevar a buen puerto la tarea, es aconsejable que el alumnado disponga de una guía que le ayude a desarrollar todo el proceso.

Por otro lado, durante la fase de preparación del debate por parte del alumnado, en los trabajos entregados encontramos poca capacidad de redacción por parte del alumnado, así como falta de criterio a la hora de discernir lo correcto de lo incorrecto. Sin embargo, a partir de la 4.ª semana se observó una mejora en la redacción y la adecuación de los argumentos

elegidos. A partir de la semana 7, empezaron a discernir si existían argumentos "a favor" o "en contra".

El día del debate es la prueba final a la que se enfrenta el alumnado, donde quedan expuestos el nivel de conocimientos adquiridos, la adecuación de los argumentos elegidos y la capacidad de respuesta inmediata. Es una prueba compleja, que, sumada a la inexperiencia del alumnado, hace que se convierta en un verdadero reto para ellas y ellos. Desde la perspectiva docente, observamos áreas de mejora en torno al desarrollo del propio debate, como son: adecuar el tiempo de defensa; aumentar la frecuencia de preguntas a realizar al equipo contrario; mejorar el lenguaje no verbal (postura, posición, gestos); progresar en el control del nerviosismo; e incrementar el nivel de concentración y escucha.

A pesar de no disponer aún del análisis de los datos de este curso, el feedback de los estudiantes nos hace pensar que el DUG ha fomentado un aprendizaje significativo. La experiencia docente e investigadora en esta nueva área refuerza el interés por seguir profundizando en el uso de metodologías activas, así como aporta nuevas estrategias para buscar futuras líneas de actuación que traten de corregir aquellos aspectos negativos encontrados y poder reforzar los positivos con el objetivo de mejorar el proceso enseñanza-aprendizaje del alumnado.

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Facilitated Multi-Source Feedback – exploring a new model for professional development of academic staff

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Abstract

Recent years have seen institutional and political calls for tools and strategies to 1) appreciate teaching and research on an equal footing, and 2) implement mandatory professional development for teachers at all career levels to ensure high quality teaching. However, comprehensive models for developing and appreciating quality teaching are scarce, leaving the measure of teaching performance and quality of teaching primarily to student evaluations. Several higher education researchers have raised a critique of such mono-source instruments, as they yield limited insight into teachers' actual performance and practices. Alternative feedback models seem to be needed in professional development to provide sufficient insights into teachers' performance and practices, which are a prerequisite for determining the need for change.

Therefore, we conducted a qualitative study to explore structured and facilitated multi-source feedback as a new direction in professional development in higher education.

The aim of the study was to investigate the potential viability of a *Facilitated Multi-Source Feedback model* (FMSF-model) to facilitate teachers' professional development at all levels.

We collected qualitative data from semi-structured qualitative interviews (n = 15) with participating teachers and students. Qualitative data coding and analysis were initially inductive but, after the themes emerged, we used organizational learning theory to group themes into cultural aspects of importance for multi-source feedback processes and professional development.

Findings show that the FMSF-model is viable. It yields relevant knowledge about strengths and weaknesses in teachers' competencies and shows potential to facilitate individual action-orientated reflection that qualifies further professional development. However, cultural facets and lack of peer-observation influence teachers' motivation and ability to provide comprehensive feedback. The findings suggest further development of the model as it shows potential to address the call for innovation in the field of higher education professional development.

1. Introduction

Maintaining and developing high quality in teaching and preparing higher educations for the future must be approached from multiple levels [1], [2] including the individual teacher [3], [4], cultures of teaching [5]-[8] and the institutional level [9], [10].

For many years, student ratings and student evaluations have dominated as the primary and, frequently, only measure of teaching performance and quality of teaching in higher education. Recently, higher education researchers [11]-[15] have raised critique of such mono-source rating instruments, as they do not embrace the context of teachers' pedagogical practice and thus have limited effect on teachers' professional development. If we look into related fields of practice such as medical education [16]-[20] and management [21]-[24],

multi-source feedback (MSF or 360° feedback) are validated and integrated components of professional development programs. MSF is characterized by a two-fold feedback structure with two main elements: 1) multiple categories of feedback-providers fill out a feedback questionnaire that rates the competencies of a feedback-recipient, and 2) a certified feedback-facilitator meets with the feedback-recipient in a facilitated dialogue that aims to convey the mean scores of the ratings, aid reflection, and stimulate professional development.

Structured feedback [25] and facilitated feedback [26] have proven useful strategies in professional development because the structured and facilitated feedback process can make recipients more accepting and thus more likely to use the feedback as a catalyst for implementing actual changes. However, to the best of our knowledge, research concerning the use of structured and facilitated multi-source feedback as a tool for professional development among higher education teachers is sparse.

This paper presents the results from a pilot project where we developed, tested and explored a *Facilitated Multi-Source Feedback model* (FMSF-model) for professional development of higher education teachers. Our goal was to develop a model that 1) offered teachers insights into how multiple feedback-providers consider the teachers' pedagogical competence in various settings, 2) offered teachers a space for reflecting on this feedback and for identifying and acknowledging needs and potentials for change, and 3) encouraged teachers to develop specific objectives and strategies to accomplish change [26].

Applying a productive organizational learning perspective in a qualitative interview study, we explored how the feedback-providers and the feedback-receiving teachers experienced barriers and potentials of the FMSF-model as a professional development tool, and how cultural facets of the higher educational context influenced the feedback process. Thus, the aim of this paper was to investigate the potential viability of the FMSF-model.

2. Theoretical Framework

The analytical framework for this study was based on the *Multifacet Model of Organizational Learning* [27], which offers a conceptual framework to identify and study facets of an organizational learning system that can either inhibit or facilitate learning. It builds on the *Theory of Action* [28], within which organizational learning is seen as a continuous process of detecting and correcting errors based upon productive communication within the organization. Feedback processes between the members of the organization play a vital role in organizational learning, but can be inhibited by defensive communication. According to Lipshitz *et al.* (2002), cultural norms that are conducive to productive communication include transparency, integrity, inquiry and issue-orientation. These norms are based on organizational commitment and trust among the organizational members. We applied the organizational learning perspective to unfold cultural aspects within the investigated context, which may influence the feedback processes, and subsequently affect the FMSF model's viability to facilitate professional development. We found this particular perspective relevant, because the central component of the FMSF-model is communication between organizational members, with the aim of improving performance.

3. Methods

The study was a qualitative interview study, exploring the participants' experience with the FMSF model. The context of the study was Department of Public Health at Aarhus

University in Denmark, which includes a broad range of non-clinical health sciences educations and engages in professional development activities.

Development of the FMSF-model

The FMSF-model was developed in an iterative process. First, with reference to the aforementioned validated MSF-strategies, and literature on higher education teaching we developed a theoretical framework of the two main elements in the FMSF-model: 1) the feedback questionnaire for the feedback-providers and 2) the facilitated dialogue based on a feedback report with results from the questionnaire. Secondly, PeoplePartner ApS, who conducts multi-source feedback in postgraduate medical education in Denmark, provided consultancy on the questionnaire drafts, software for processing data from the feedback questionnaire, and certification of MKC (first author) as feedback-facilitator. Thirdly, the FMSF-model was pre-piloted internally by a feedback-recipient (1 teacher), seven feedback-providers (3 teacher colleagues and 4 students) and a feedback-facilitator (first author), who participated in semi-structured interviews exploring the participants' experience with the model. Fourthly, we made minor adjustments in the questionnaire prior to the pilot test, and finally, we described the FMSF-model in FMSF instruction papers and videos aimed at the participants.

The FMSF questionnaire

The FMSF questionnaire[1] covered nine areas of professional competence in higher education teaching: "Cooperation", "Feedback", "Dialogue", "Communication", "Planning", "Alignment", "Learning activities", "Evaluation" and "Responsibilities". Observable criteria for good teaching were featured in 47 statement-based items, and rated using a seven-point Likert scale anchored by "strongly disagree" and "strongly agree". Unanswered items were registered as "do not know". The questionnaire included structured commentary boxes encouraging feedback-providers to add formative comments and/or elaborate on their feedback. We estimated a timeframe of 15 minutes to fill out the questionnaire.

The feedback report

The ratings from the questionnaire were gathered in a feedback report. Numerical ratings featured as mean scores in bar charts hereby anonymizing the feedback-providers. Comments featured unedited. Based on a joined survey of the report, deliberate reflection on pedagogical practice and professional development was encouraged through the facilitation of feedback performed by the certified feedback-facilitator.

Participants

Two experienced teachers volunteered as feedback-recipients following an email invitation and a presentation at an academic staff meeting. Subsequently, they independently recruited their feedback-providers within the categories of "students" and "colleagues"

[1] The FMSF questionnaire can be requisitioned from the authors at the Euro-SoTL 2019 conference.

using written standard invitations with detailed information on the purpose, design, ethical considerations, confidentiality, and practicality of the pilot project. The self-recruitment served to ensure the feedback-providers' familiarity with the feedback-recipients' pedagogical practice [29]. 15 feedback-providers (6 teacher colleagues and 9 students) were recruited during two weeks.

Data collection and analysis

We conducted semi-structured exclusive interviews [30] (n = 15) with feedback-providers (5 colleagues and 8 students) and feedback-recipients (2 teachers). Themes guiding the interview included the participants' rationales for participation and experiences of providing and receiving feedback. Open questions encouraged rich and nuanced descriptions and enabled participants to introduce important dimensions within the themes [30]. The transcribed interview material was organized in the qualitative data-analysis software package Nvivo 12. The transcriptions were initially coded openly [30] and after the themes emerged, we did a theoretical reading using the organizational learning theory.

4. Results

All participants began and completed the feedback questionnaire with a mean response rate of 76.6% of the 47 items. Feedback-receivers had a total response rate of 100%, students 85.58% and colleagues 67.85%. In the following section, we present the findings from the qualitative interviews. First, we focus on the participants' commitment and experiences of barriers and potentials of the FMSF-model, and then we describe our interpretation of how cultural facets of the higher educational context influenced the feedback process.

Potentials of the FMSF-model

In the qualitative interviews, colleagues and students described their thoughts on providing feedback. Distinctive for most answers was an emphasis on the potential of feedback to provide professional development, and that participation in this development process is a matter of course. Besides a strong commitment to help the individual teacher's development, data indicates an organizational commitment in the participants' wish to improve the educational quality of the institution. Feedback-recipients revealed an inquiring approach to their teaching practice and expressed curiosity toward the FMSF-model:

> Teacher2: *Personally, the goal was to get better at what I am doing, and, compared to other feedback possibilities at Aarhus University, this (FMSF) was a way to think innovatively about it, which I found intriguing.*

In general, the participants found that the scope of items was appropriate, and that the items were clear, explicit and relevant, enabling them to provide constructive feedback within the estimated 15 minutes. The participants used the commentary boxes constructively to either elaborate on their ratings or add knowledge that the questionnaire items did not generate. The possibility to make no answer to an item was considered an important feature of the questionnaire, as the participants would rather skip items than make invalid assessments:

> Colleague2: *If I just shoot in the dark, then would it be useful at all?*
>
> Student6: *I could have just placed a guess, but that would have been unserious.*

The feedback recipients found that the FMSF triggered a reflective process regarding their teaching practice and addressed potentials for development:

> Teacher1: *The facilitation of the feedback made me see the positive ratings without neglecting the critical ones, and then find a way to address them.*

Thus, the FMSF-model show potential to accomplish its triple purpose to offer insights, facilitate reflection and guide performance change.

Barriers of the FMSF-model

Despite the overall positive experiences of participating in the FMSF-model, participants also described certain barriers. Some colleagues described feedback as intimidating and "exam-like" if given by a peer:

> Colleague2: *[…] "oh no, am I going to be observed by one of my close colleagues?" […] I think you are always afraid that someone will find fault with what you do.*

Others expressed a discomfort about student involvement:

> Colleague3: *I did not want to volunteer in this because I did not want to ask five students to evaluate me. […] I simply found that to be uncomfortable […] reversing the roles in a way…*

The discomfort of "reversing the roles" illustrates a traditional student-teacher-hierarchy with a clear distinction between 'teacher' and 'learner', which was further underlined by a teacher's devaluation of student ratings:

> Teacher1: *Had it been the other way round, that the students had given slightly lower ratings, it would not have been equally uncomfortable, I think. The students do not necessarily know best.*

The most frequently described barrier was a lack of observation, which reduced the participants' response rate:

> Colleague5: *We rarely see each other teach […] you skip the student-related items, because you know nothing about it.*
>
> Student8: *We do not see her in collegial contexts. […] You refrain from rating what you do not know.*

Thus, what posed a potential to valid ratings, equally posed a barrier to the scope of ratings. Additionally, colleagues and students had reservations towards providing feedback

that indicated incompetence in the teachers' pedagogical practice, as it posed a risk to offend or hurt the feedback-recipients and give way to negative implications:

> Student2: *[…] not that I had anything negative to say, but she is my supervisor and you just wonder if it will have an influence.*
>
> Colleague3: *If I had given low ratings, I might sneak about, trying to avoid confrontation.*

An issue of anonymity compounded this barrier as colleagues and students feared that the mean calculation of the results in the report could not disguise their individual assessment.

Cultural norms

Based on a theoretical reading [27] of the abovementioned results, the following section describes our interpretation of cultural norms within the investigated context. The interviews revealed that faculty members held no traditions to observe each other's' teaching, nor to assess each other's' teaching competencies. Although the feedback recipients demonstrated the cultural norm of inquiry [27] in their wish to question the status quo of teaching, faculty members generally demonstrated defensiveness in their fear of implying, and disclosing, incompetence and in their devaluation of student assessments. Defensiveness was demonstrated by the lack of transparency and integrity among the colleagues, as the threat of exposing incompetence inhibited their voluntariness to pursue an opportunity to develop. Data also indicated a lack of issue-orientation, as the faculty members valued the ratings with reference to hierarchical differences, instead of attending unbiasedly to the issues at hand. However, the feedback-providers' natural willingness to improve teaching and help a colleague or teacher, and their strive to provide a comprehensive feedback suggested organizational commitment and integrity which is characteristic to a productive feedback culture [27]. As illustrated in the quotations below, the FMSF-model showed potential to promote cultural change as it was received well, and triggered reflections conducive to continuous learning processes:

> Colleague5: *This [FMSF] was beneficial to me, because it forced me to stop and think about whether we could achieve more if we occasionally co-teached or payed more attention to each other's' doings.*
>
> Colleague2: *If you could overcome your fear of being criticized, this [FMSF] facilitates a potential development, as it clarifies what you do and do not. […] I think it is a good idea and that we will adjust to it in time.*

In conclusion, engaging in FMSF seemed to be a conflicting endeavour. On the one hand, it was clear that the FMSF-model's call for transparency and integrity was new and challenging to the existing teaching culture, where teaching is a private matter and there is a clear distinction between teachers and students. On the other hand, the participants found feedback desirable and showed commitment as well as integrity in the way they engaged with the FMSF-model.

5. Discussion

The aim of the study was to investigate a Facilitated Multi-Source Feedback model and its potential to facilitate higher education teachers' professional development. We found that the FMSF-model was viable in this matter, as it yielded relevant knowledge about strengths and weaknesses in teachers' competencies and facilitated reflection within both feedback-receivers and colleagues. Thus, it showed potential to facilitate productive communication, as a structured and comprehensive feedback model that was applicable within the investigated context.

The FMSF-model had some limitations. Peer-observation was not part of the culture, which inhibited the colleagues' ability to provide feedback and reduced their total response rate. However, these limitations were counterbalanced by the variety of feedback providers who represented multiple perspectives on a broad range of items in the FMSF-questionnaire, thereby yielding validity to the assessments.

Our interpretations of the data in this study suggest that the structured approach to feedback via the FMSF-model applies to workplace-based learning, and may improve educational climate and stimulate professional growth. This is in line with several studies of multi-source feedback in postgraduate medical education [16]-[20][25] and management [21]-[24]. Also, the FMSF-model reflects key elements of Scholarship of Teaching and Learning [31] such as communication [32], peer-review and critical reflection [33]. The novel finding in our study was that the cultural norm of integrity was challenged by defensive communication regarding transparency, issue-orientation and the integrity dilemma of using the FMSF-model. According to theory of organizational learning, the cultural norms of inquiry, integrity, transparency and issue-orientation are intimately linked to psychological safety and trust, because

"A sense of psychological safety makes it easier to face the potentially disturbing or embarrassing outcomes of inquiry […]" (Lipshitz *et al.*, 2002, p. 87).

Among the four cultural norms, transparency, that is exposing one's thoughts and actions to others, seems to be a defining feature of the FMSF-model. In a teaching culture without the productive communication to support transparency, the viability of the model is inhibited. Consequently, in order to implement the FMSF-model, we need to address psychological safety as a prerequisite to transparency. Other theories of organizational learning [34] [35] also point to safety and trust as conditions for learning in higher education workplaces. Torgny Roxå and Katarina Mårtensson [34] suggest four ideal-types of microcultures in higher education workplaces based on two key aspects —trust and shared experience of responsibility— that influence how teachers see each other and how they practice. With reference to our findings, we suggest that academic developers and leaders may benefit from addressing the ideal-types and identify potential barriers, thus enabling them to take precautionary measures and ensure psychological safety before engaging with the FMSF-model. Hence, teachers providing and receiving feedback would more likely gain full potential of the feedback. This is important for the viability of the FMSF-model and for teachers to succeed in professional growth.

The main message of the study is that the FMSF-model is viable but strongly linked to trust and transparency as a cultural norm and as an actual practice of peer-observation.

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¿Qué podemos aprender de otros contextos? Un estudio sobre el practicum de magisterio en España, Italia y Portugal

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Abstract

This work aims to broaden the knowledge about practicum in the teaching degree from a reflective training paradigm. In this sense, reflection is understood as a process of learning through experience leading, on the one hand, to a greater understanding of oneself and of the practice developed and, on the other, to reorient or plan future educational experiences. Thus, our research aims to comparatively analyze the teaching practicum initiatives in three European countries, Italy, Portugal and Spain, which have participated in the process of convergence towards the European Higher Education Area (EHEA). Also, the three of them deploy reflective training strategies in the practicum. The ultimate purpose is to identify the virtualities of each experience and advance some elements of improvement. We carried out fourteen semi-structured interviews with practicum supervisors from the three countries. Also, we have analyzed official practicum documents The comparative analysis procedure, of a qualitative nature, revolves around three categories of analysis: sense of the practicum in the training process, professionals involved and reflective activities deployed. The results show coincidences in the conceptualizations of the practicum at the prescriptive level of the three institutions. These results diverge, precisely, with some ideas located in discourses of the participants. This is all the more true in the case of Spain and Italy. Likewise, we discovered some valuable reflective strategies undertaken by the supervisors: guide reflection through questions, follow up and return the journal regularly, promote bibliographic analysis and case studies, suggest to students interviewing education professionals (teachers, management team, school counselor), develop dialogical seminars. Finally, we analyze the importance of school mentors also participating in reflective tasks, as in the case of Portugal. Some conclusions of improvement go in line with institutionalizing more reflective moments throughout the practicum and involving students, university teachers and school teachers in them.

Resumen

Este trabajo pretende ampliar el conocimiento sobre el practicum en la titulación de magisterio desde un paradigma de formación reflexiva. Entendemos la reflexión como un proceso de aprendizaje a través de la experiencia conducente, de un lado, a una mayor comprensión de uno mismo y de la práctica desarrollada y, de otro, a reorientar o planificar experiencias educativas futuras. Nuestra investigación tiene por objetivo analizar comparativamente las iniciativas de practicum de magisterio en tres países europeos, Italia, Portugal y España, que han participado en el proceso de convergencia hacia el Espacio Europeo de Educación Superior (EEES) y que despliegan propuestas de formación reflexiva en las prácticas. El propósito último es identificar las virtualidades de cada experiencia y avanzar algunos elementos de mejora. Se han desarrollado 14 entrevistas semiestructuradas a supervisores de practicum de los tres países y se han analizado documentos oficiales de los diferentes programas de practicum. El procedimiento de análisis comparativo, de carácter cualitativo, gira en torno a tres categorías de análisis: sentido del practicum en el proceso formativo, los profesionales implicados y las actividades reflexivas desplegadas. Los resultados manifiestan coincidencias en las conceptualizaciones del practicum a nivel preceptivo en las tres instituciones. Dichos resultados divergen, precisamente, con algunas ideas localizadas en discursos de los participantes, que se acusan de manera preponderante en el caso de España e Italia. Asimismo, descubrimos algunas estrategias reflexivas de valor emprendidas por los supervisores: guiar la reflexión a través de preguntas, realizar seguimiento y devolución del diario regularmente, promover análisis bibliográficos y estudios de caso, sugerir que los alumnos entrevisten a

profesionales de la educación (maestros, equipo directivo, orientador/a), desarrollar seminarios dialógicos, etc. Igualmente, analizamos la importancia de que los mentores de escuela participen también en las tareas reflexivas, como ocurre en el caso de Portugal. Algunas conclusiones de mejora van en línea con institucionalizar más momentos reflexivos a lo largo de la formación práctica e implicar en ellas a alumnos, docentes universitarios y maestros de escuela.

1. Introducción

La importancia del practicum en la formación de docentes es holgadamente reconocida (Bruno & Dell'Aversana, 2018; Sorensen, 2014). Se entiende como el periodo de formación docente, integrado en el plan de estudios, que los alumnos desarrollan en centros educativos y cuyo objetivo es la reflexión y el aprendizaje a partir de situaciones con carácter de realidad (Saiz y Susinos, 2017). Sin embargo, el discurso de las políticas de mercado orienta esta formación más a la capacitación profesional que a proporcionar una experiencia formativa reflexiva, crítica y global (Zabalza, 2011). Por ello, apremia redefinir el practicum, entendiendo que ha de "proporcionar una formación de la inteligencia y el saber crítico, conjugado con un saber especializado profesionalizador" (Bolívar, 2008, p. 16).

Este trabajo se sitúa en la tradición de la práctica reflexiva (Beavers, Orange & Kirkwood, 2017; Russell, 2017; Schön, 1998). Se concibe la reflexión como un proceso de aprendizaje a través de la experiencia conducente, de un lado, a una mayor comprensión de uno mismo y de la práctica y, de otro, a reorientar experiencias educativas futuras (Vassilaki, 2017). De esta suerte, el practicum no puede relegarse al aprendizaje de los trucos del oficio, sino que debe permitir resituar el conocimiento del alumnado para comprender y reorientar sus actuaciones (Arias, Cantón y Baelo, 2017). Asimismo, facilita la inmersión de los futuros maestros en la cultura profesional y la "comunidad de práctica" (Wenger, 2001), desde el reconocimiento del valor que tienen las prácticas de los buenos maestros y su conocimiento práctico (Clandinin y Connelly, 2000; Schön, 1998).

Nuestra investigación tiene por objetivo analizar comparativamente las iniciativas de practicum de magisterio en tres países europeos, Italia, Portugal y España, que han participado en el proceso de convergencia hacia el Espacio Europeo de Educación Superior (EEES) y que despliegan propuestas de formación reflexiva en las prácticas. El propósito último es identificar las virtualidades de cada experiencia y avanzar algunos elementos de mejora.

2. Metodología

Las estancias de las investigadoras durante dos años permite realizar una recogida de datos sobre el practicum de Magisterio desarrollado en tres Universidad Europeas: la Universidad de Cantabria (España), la Universidad de Padua (Italia) y la Universidad de Coimbra (Portugal). Con este enfoque comparado podemos comprender la realidad de cada contexto desde una perspectiva amplia que reconoce aspectos locales que facilitan o dificultan el practicum, así como los aspectos communes y también las divergencias. Todo ello nos permite deriver algunos aprendizajes sobre la experiencia formative que proporciona el practicum.

Realizamos 14 entrevistas semiestructuradas a informantes clave de cada institución: seis profesionales de la Universidad de Cantabria que ejercen como supervisores: 3 de ellos asociados y 3 a tiempo completo, pertenecientes a áreas de conocimiento diferentes. Por otro lado, 4 profesionales de la Universidad de Padua: 3 profesores que desarrollan el "tirocinio

indirecto" (acompañan al alumnado en los procesos de reflexión durante el practicum) y la coordinadora del programa de prácticas. Finalmente, 4 participantes corresponden a la Universidad de Coimbra: el coordinador de practicum y 3 supervisores de la universidad.

Complementariamente, se analizaron los documentos oficiales acerca de la asignatura de practicum, permitiéndonos completar la información obtenida en las entrevistas.

Para el análisis, abordamos 4 fases de complejidad creciente (Manzón, 2018): descripción de la información, interpretación, confrontación de diferentes respuestas y comparación orientada a establecer las conclusiones del estudio. En este proceso, sometimos a los datos a un proceso de categorización deductiva-inductiva en el que obtenemos tres categorías de análisis: sentido del practicum en el proceso formativo, las actividades reflexivas en los centros de prácticas y aquellas otras que ocurren en la academia.

3. Resultados

3.1. Sentido del practicum

Descubrimos coincidencias a nivel normative en el modo de comprender el practicum, que combinan una idea profesionalizadora del mismo con acciones de carácter reflexivo. El objetivo ultimo en los tres casos es posibilitar que los estudiantes de prácticas establezcan relaciones entre la experiencia en las escuelas y los aprendizajes que realizan en la academia. Algunas estrategias que se proponent en los distintos practicum son: la búsqueda de recursos e información, el feedback, la colaboración o la supervisión sobresalen como ejes fundamentales.

> "Se pretende expandir las competencias profesionales adquiridas en la academia en el contexto de la iniciación a las prácticas profesionales, persiguiendo una mayor responsabilidad y autonomía en las prácticas de enseñanza, así como favorecer prácticas de reflexión profesional." (Guía U. de Coimbra)

Respecto a los discursos de los participantes, encontramos algunas inconsistencias con respecto a lo reflejado en los documentos normativos. En el caso español dominan las conceptualizaciones que conjugan la dimensión reflexiva y la experiencial:

> "El practicum debería nutrirse de todo lo teórico que hemos enseñado en la universidad y que luego en la realidad toma su poso. Es ese contraste: de lo que veo en la realidad y lo que he aprendido." (Entrevista participante Cantabria)

Sin embargo, también sobresale en algunos discursos un significado del practicum como periodo de iniciación profesional en el que adquirir conocimientos de carácter práctico:

> "Una exposición directa a esa profesión que van a ejercer con compañeros reales y con situaciones totalmente auténticas." (Entrevista participante Cantabria)

A pesar de su intención formativa y la idea de complementar equilibradamente los procesos de acción y reflexión, la realidad es que la estructura del practicum —los alumnos pasan la totalidad del periodo formativo en la escuela— y las escasas oportunidades contempla-

das para emprender procesos de acompañamiento reflexivo —únicamente han de realizarse 2 seminarios con el tutor universitario— justifican, en alguna medida, estas definiciones situadas en el polo profesionalizador.

En los discursos de los participantes padovanos observamos también una tendencia a disgregar la teoría y la práctica y a concebir el practicum desde su vertiente más profesional, como contexto de ensayo del rol del docente:

> "El practicum es una de las cosas más importantes porque el estudiante se da efectivamente cuenta de lo que después tendrá que hacer como profesional." (Entrevista participante Padua)

En nuestro intento por comprender estas nociones encontramos una razón esclarecedora: los supervisores del practicum de la universidad de Padua son maestros que trabajan parte de la semana con los alumnos de prácticas y la otra mitad del tiempo en sus escuelas. Es decir, son supervisores que provienen del campo práctico, mientras que los profesores universitarios no tienen ningún espacio de participación. Así lo expresa una de nuestras participantes:

> "Muchos [profesores de universidad] no saben qué está ocurriendo en el programa de practicum. Los profesores universitarios no entran a lo que se hace en el practicum. (Entrevista participante Padua)

Ese en el caso de Coimbra donde encontramos la mayor coherencia con la definición normativa. Los participantes comprenden que el objetivo del practicum es "tomar conciencia de lo que hacemos, por qué y de cómo podemos mejorar" (Entrevista participante Coimbra), siendo cardinal para este propósito la reflexión sobre la experiencia desarrollada. El practicum, de esta suerte, deviene en elemento estructurante que permite conectar todos los componentes de la formación. La multitud de actividades reflexivas desarrolladas y la implicación conjunta de alumnos, supervisores universitarios y mentores de escuela (a partir de seminarios compartidos entre estos tres agentes o la entrada de los tutores universitarios en las aulas de prácticas) permiten explicar el porqué de esta conceptualización.

3.2. Profesionales implicados y sus funciones

En Cantabria y Coimbra la función de supervision académica del practicum es desarrollada por un profesor universitario mientras que, en Padua, se contempla una figura diferente: supervisan maestros de escuela que se vinculan con la universidad y fragmentan su jornada laboral entre el trabajo en la escuela y las tareas de acompañamiento en el practicum. El profesor universitario no tiene en el practicum padovano ninguna función otorgada, lo que sugiere cierta escisión teórico-práctica ya en la propia estructura.

Asimismo los alumnos tienen un mentor dentro de su escuela de prácticas. En Cantabria y Padua se contemplan funciones vinculadas con la acogida de los estudiantes y la iniciación en la tarea profesional, es decir, con la acción:

> "Posibilitar la iniciación en la práctica docente. Contribuir a que el estudiante se familiarice con la dinámica del aula, planificándo su intervención en la clase, supervisando el diseño y planificación de sesiones, orientándolos sobre su actuación." (Guía U. Cantabria)

> "Acoger al estudiante: proporcionar explicaciones, organizar visitas a las instalaciones, proporcionar documentación, etc. Ayudar a los estudiantes a comprender la organización del contexto escolar." (Guía U. Padua)

En Coimbra, además de las señaladas, los mentores de escuela participan en los seminarios destinados a actividades de carácter reflexivo.

3.3. Actividades desarrolladas

Analizaremos aquí las actividades desarrolladas en los centros de prácticas y aquellas otras que ocurren en la academia.

Las actividades que ocurren en las escuelas se orientan generalmente a tareas de observación y en momentos subsiguientes permiten cierta intervención por parte de los alumnos. De modo general, las actuaciones se dirigen, por una parte, a los procesos curriculares dentro del aula (planificación, metodología, evaluación, etc.) y, por otra, refieren a funciones propias de la organización escolar (coordinación, comunicación con las familias…). De alguna manera, en Cantabria y Padua se produce una división entre las actividades experienciales, orientadas a "aprender a hacer", encomendadas a los centros de prácticas, y las de carácter reflexivo, a cargo de la Universidad. En Coimbra, como ya dijimos, se entiende que los mentores de escuela deben participar en las tareas reflexivas, participando en algunos seminarios junto con el supervisor universitario y el grupo de alumnos.

Respecto a las actividades de practicum desarrolladas en la Universidad, en Cantabria se orientan al cometido reflexivo y se concretan a través del desarrollo de un portfolio (compuesto por un diario de prácticas y un informe, de carácter más sistemático), siendo el supervisor universitario el encargado de su orientación y evaluación. Sí encontramos diferencias en la tarea de orientación realizada por los diferentes supervisors en Cantabria: algunos limitan su acompañamiento a los dos seminarios ineludibles mientras otros desarrollan estrategias reflexivas que rebasan las actividades planteadas por la facultad. Normalmente, dichas estrategias tratan de favorecer tareas de análisis y deliberación sistemática y tienen la vocación de conectar los contenidos teórico-prácticos y favorecer una comprensión más profunda y crítica de las experiencias de los alumnos en sus centros de prácticas:

> "Les cuesta [reflexionar] debido a la escasez de escenarios para reflexionar sobre la acción, donde ir contrastando, en función del análisis bibliográfico, de la información proporcionada a través de diferentes fuentes y de las experiencias de aprendizaje, y reflexionando críticamente sobre lo que está sucediendo." (Entrevista participante Cantabria)

El sistema de Padua y Coimbra, en contraste, presenta una estructura más consistente con el intento por engarzar la acción y la reflexión. En ambos casos se plantean seminarios semanales destinados a desarrollar actividades reflexivas, como: preparación de listas de observación, laboratorios de microteaching, reflexión sobre estudios de caso. Tal y como señala una de las profesionales entrevistadas:

> "Tienen que evaluar lo que ellos hacen con los niños. También ellos tienen que probar pequeñas experiencias con sus compañeros. El microteaching, lo graban y después lo analizan todos juntos con una check-list: analizan cómo hablan, cómo se mueven, cómo usan el tiempo, cómo utilizan los recursos…" (Entrevista participante Padua)

Similarmente, en Coimbra desarrollan "un seminario semanal que dura cuatro horas destinado a la reflexión, planificación de la intervención, análisis de caso…" (Entrevista participante Coimbra). Los diferentes seminarios se articulan en torno a las tareas que los alumnos deben abordar en sus portfolios: caracterización del contexto, fundamentación de la acción, planificación de la intervención, reflexión sobre casos críticos (Guía U. Coimbra).

4. Conclusiones

Resaltamos en este ultimo apartado algunos aprendizajes que se traslucen de esta experiencia de investigación comparada:

Resulta imprescindible favorecer un mentorazgo más colaborativo entre profesores universitarios y maestros (Allen, Ambrosetti y Turner, 2013; Zabalza, 2011). Una coordinación fluida y coherente en las actuaciones (tanto en las actividades formativas como en la evaluación) son fundamentales para proporcionar experiencias de valor formativo (Van Velzen, Volman, Brekelmans y White, 2012). Asimismo, subrayamos la necesidad de seguir indagando sobre esta fractura teórico-práctica atisbada e imaginar diferentes estrategias reflexivas orientadas a hilvanas los aprendizajes en la academia y en los centros de prácticas. Asimismo, es reseñable que en ninguna de las tres instituciones se menciona a las TIC como recurso para promover reflexiones dialógicas, si bien es contrastado su valor para este fin por diferentes investigaciones (Allaire, 2015; Collin y Karsenti, 2012).

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Perspectiva académica de la enseñanza del profesorado universitario: ¿sobre qué prácticas reflexionan los docentes a partir de su formación?

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Abstract

By the time health professionals decide to train as university teachers, they are usually exercising this activity as a secondary task to their healthcare work. Faced with this, teacher training programs have the challenge of recognizing what these teachers already do and know to professionalize their teaching practice. That is, to problematize the teaching conceived as a lecture or process of communication of information to develop a perspective centered on the learning activities of the students. One way to work on teachers' conceptions and practices is writing (Schön, 1998, Perrenoud, 2004, Domingo and Anijovich, 2017) and a tool to give continuity and depth to this process of reflection on their real practices is the Portfolio (Moon, 2007, Groom and Maunonen-Eskelinen, 2006, Carlino, 2010). In this study we characterize what university teachers of health sciences reflect on, within the context of a pedagogical training program in service for two years. We analyzed 965 written productions in the portfolios of 175 teachers who carried out their training between 2007-2016 through a descriptive-interpretative qualitative study. In the documentary analysis, we identify in which topics they focus their teaching concerns with scientific contributions from pedagogy. As a tendency we find mainly writings that problematize teaching strategies focused on lecture and in which they design activities for their students based on problem or case learning, simulations and role playing, collaborative learning, etc. Secondly, they reflect on the formative and summative assessment looking for instruments centre on competences rather than knowledge. They also critically revise curricular designs and move into new programs focused on learning objectives instead of just proposing lists of topics organized in a timeline. Thus, we show reflective actions when writing about what teachers think and do regarding their university work. This overview on the content of his reflections, that is to say on the teaching practices reviewed in the light of pedagogical theories, attests the value of teacher training program which professionalize teaching and promote the transfer of what has been learned to their practice as health science university teachers.

Resumen

Es habitual que los profesionales de la salud que deciden formarse como docentes universitarios ya estén ejerciendo esta actividad en forma secundaria a su tarea asistencial. Frente a esto, las propuestas de formación docente tienen el desafío de reconocer aquello que ya hacen y saben para profesionalizarlos. Es decir, problematizar la enseñanza concebida como un proceso de comunicación y exposición de información para desarrollar una perspectiva centrada en las actividades de aprendizaje de los estudiantes. Una manera de trabajar sobre concepciones y prácticas de los docentes es la escritura (Schön, 1998; Perrenoud, 2004; Domingo y Anijovich, 2017) y una herramienta para darle continuidad y profundidad a ese proceso de reflexión sobre sus prácticas reales es el Portfolio (Moon, 2007, Groom y Maunonen-Eskelinen, 2006; Carlino, 2010). En este trabajo caracterizamos aquello sobre lo que los docentes universitarios de ciencias de la salud reflexionan, en el contexto de un programa de formación pedagógica en servicio de dos años. Analizamos 965 producciones escritas en los portfolios de 175 docentes que realizaron su formación entre 2007-2016 mediante un estudio cualitativo descriptivo-interpretativo. En el análisis documental identificamos en qué temáticas enfocan sus preocupaciones docentes con aportes científicos de las ciencias de la educación. Como tendencia encontramos principalmente escritos que problematizan estrategias de enseñanza centradas en la transmisión y en los que diseñan actividades para sus estudiantes basadas en solución de problemas, análisis de casos, uso de simulaciones y role playing, aprendizaje colaborativo, etc. En segundo lugar reflexionan sobre la evaluación formativa y su-

mativa buscando instrumentos para evaluar competencias más que conocimientos. También revisan críticamente diseños curriculares y avanzan en nuevos programas centrados en objetivos de aprendizaje en lugar de sólo proponer listados de temas organizados en un cronograma. Así, mostramos las acciones reflexivas ejercidas al escribir sobre lo que piensan y hacen respecto de su actividad docente universitaria. Esta mirada sobre el contenido de sus reflexiones, sobre sus prácticas docentes revisadas a la luz de teorías pedagógicas, evidencia el valor de un programa de formación que propone profesionalizar la tarea universitaria y transferir lo aprendido a sus tareas como profesores en ciencias de la salud.

1. Introducción

Es habitual que los profesionales de la salud que deciden formarse como docentes universitarios ya estén ejerciendo esta actividad en forma secundaria a su tarea asistencial. Esto implica que la docencia queda relegada a la "clase" casi sin preparación previa ni revisión de lo hecho. Asimismo, tienden a desempeñarse reproduciendo acríticamente prácticas educativas centradas en la exposición de información y en evaluar para constatar la reproducción de conocimientos declarativos aún cuando estén formando para el ejercicio de una profesión.

Frente a esto, las propuestas de formación docente tienen el desafío de reconocer aquello que ya hacen y saben y tomarlo como objeto de reflexión si se pretende profesionalizarlos. Es decir, problematizar la enseñanza concebida como la exposición de información, el papel de la planificación como listado de temas y la evaluación como calificación, entre otras cuestiones posibles.

Encarar estos procesos de transformación requiere revisar concepciones construidas en la biografía escolar y arraigadas en socialización profesional como docentes y supone un fuerte compromiso de reflexión sobre la propia práctica. Reflexionar implica la consideración cuidadosa y detenida de una creencia o conocimiento a la luz de sus fundamentos y los propósitos a los que sirve (Dewey, 1938). Se trata de un proceso mental de organización de ideas para la construcción de una solución que no resulta obvia (Moon, 2004, 2007).

Una manera de trabajar reflexivamente es la escritura (Schön, 1998; Perrenoud, 2004; Domingo y Anijovich, 2017) que pone en relación la propia práctica con herramientas conceptuales que permiten ir más allá del sentido común y generar nuevos aprendizajes. Escribir se convierte en una herramienta fundamental que favorece procesos psicológicos para la construcción del conocimiento, su resignificación y apropiación. (Carlino, 2005, 2010).

El porfolio es un dispositivo que permite darle continuidad y profundidad al proceso de reflexión escrita sobre las propias prácticas (Moon, 2007, Groom y Maunonen-Eskelinen, 2006), en tanto propicia el registro de los aprendizajes a través de materiales elaborados en el proceso de aprender y da cuenta del tránsito por las experiencias vividas durante el proceso de formación.

En este trabajo estudiamos los porfolios de docentes universitarios de ciencias de la salud producidos en el contexto de un programa de formación pedagógica en servicio de dos años, con el objetivo de identificar el contenido de las reflexiones escritas sobre sus prácticas docentes.

2. Metodología y contexto de la investigación

Esta investigación fue desarrollada en un Instituto Universitario de la Ciudad de Buenos Aires (Argentina) orientado al campo de la salud en los niveles de grado (medicina, enferme-

ría, bioquímica, etc.), posgrado (maestrías, doctorados y formación continua) así como de especializaciones en servicio a través del sistema de residencias hospitalarias. En este contexto, se llevaron adelante nueve ediciones de un Programa de posgrado de formación pedagógica de dos años de duración destinado a los docentes de la universidad. En la documentación pública de este Programa se establece entre sus propósitos: 1. Propiciar la reflexión sobre la práctica docente para desarrollar una mirada crítica de los participantes. 2. Promover procesos de mejora de la práctica docente. Los propósitos de este Programa lo vuelven un caso de interés para estudiar la formación de docentes reflexivos.

Como parte de esta formación los participantes deben elaborar un portfolio, compuesto por seis folios en los que relatan y reflexionan prácticas que realizan como parte de su actividad docente habitual[1]. Las consignas establecen que deben incluir al menos un folio referido a programación, otro a evaluación y uno a estrategias de enseñanza. Los restantes pueden reiterar estas temáticas o enfocar otras referidas a la docencia universitaria.

En este estudio tomamos como unidad de análisis metodológica cada uno de los folios, los que comprenden un universo de 965 documentos elaborados por 175 docentes que completaron la cursada del Programa.

Se trata de un estudio cualitativo descriptivo-interpretativo. Como instrumento de registro se construyó una matriz utilizada para procesar los datos. Ésta fue construida en sucesivas aproximaciones a partir de un tratamiento inicial de los folios que nos permitió estabilizar las dimensiones de análisis y los códigos correspondientes a cada una de éstas.

Dado que algunas integrantes del equipo de investigación también fueron parte del equipo de formación docente se prevén resguardos metodológicos para evitar el sesgo. En relación con la implicación personal durante el proceso de codificación y de construcción de la matriz se procura la lectura de los Folios por parte de un segundo investigador para contrastar interpretaciones. Asimismo, se determina que el procesamiento del 80% de las producciones escritas esté a cargo de profesionales no vinculados con el contexto docente en el que se producen, lo que conlleva una baja implicación.

El análisis nos permitió caracterizar tres rasgos de los folios: 1. el contexto específico de cada una de las prácticas narradas (nivel educativo, modalidad, marco curricular, etc.), 2. las temáticas abordadas por los docentes al reflexionar sobre sus prácticas y 3. tipo de acciones reflexivas desplegadas en el proceso de escritura[2]. En esta ponencia, nos centraremos en el segundo rasgo.

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[1] En publicaciones anteriores hemos caracterizado a esta propuesta como un dispositivo para ejercer una práctica profesional reflexiva (previamente dispositivo para jugar el juego completo de la docencia Cfr. Schwartzman, Eder y Roni, 2014). Se trata de dispositivos de formación que permiten encontrar cuestiones abiertas y problemas reales, con especial atención en las áreas de incertidumbre y controversia del quehacer docente, con la intención de cuestionar concepciones y hacer conscientes los propios repertorios de acción, a través de instrumentos conceptuales de análisis que permiten recuperar las complejas variables definidas por los contextos: por qué y qué revisar del quehacer docente, para qué, bajo qué condiciones, qué herramientas se brindan como necesarias para el cambio, qué estrategias institucionales se activan, etc. Desde estas dimensiones es valioso compartir y socializar los sentidos, necesidades, ventajas que conciernen a las propuestas educativas en las que los cursantes están involucrados.

[2] Presentamos los resultados referidos a las acciones reflexivas en otra ponencia que también toma parte de esta edición 2019 de Eurosotl: “Problematizar, Diseñar y Valorar. Acciones reflexivas para mejorar la tarea docente”.

3. Resultados

La experiencia de más de quince años de formar docentes de las ciencias de la salud nos informa que las temáticas que les preocupan inicialmente giran en torno a mejorar sus clases (estrategias) y a saber si éstas fueron "exitosas" (si a sus estudiantes les fue bien en los exámenes). Adicionalmente, el Programa objeto de este estudio solicita la consideración de tres temática específicas en los folios: estrategias de enseñanza, programación y evaluación de los aprendizajes. Dado este contexto, encontramos como resultado más saliente esas mismas temáticas ocupando 82% de los folios. A continuación presentamos su distribución (*Tabla 1*).

Tabla 1
Distribución porcentual de temáticas abordadas en los folios

Tema	N	%
Estrategias de enseñanza	424	44
Evaluación de los aprendizajes	220	23
Programación de la enseñanza	144	15
Rol docente	63	7
Rol alumno	50	5
Didáctica	21	2
Tecnologías de la Información y la Comunicación	17	2
Gestión educativa	16	2
Otros	10	1
Total	965	100

La *Tabla 1* muestra otras temáticas (18%) emergentes: *gestión educativa, tecnologías de la información y comunicación, rol de los alumnos, rol de los docentes*. Éstas dan cuenta de otras cuestiones que los docentes, en ocasión de la formación, necesitan traer a la reflexión, aunque en menor porcentaje, ampliando las preocupaciones iniciales al reconocer otros aspectos de su identidad como docentes universitarios.

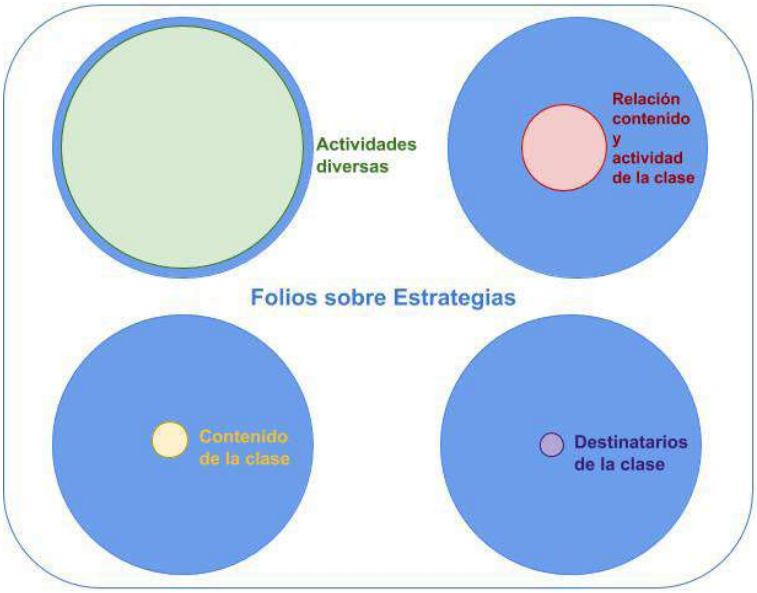
Dada esta disparidad en la distribución de las temáticas de los folios, detallaremos a continuación el contenido al interior de las tres temáticas salientes con el objetivo de conocer con más detalle qué les preocupa.

De la exposición magistral a la diversidad de estrategias de enseñanza en la universidad

La mayoría de los docentes llegan a la formación con un uso frecuente de la clase expositiva y preguntándose cómo cómo garantizar una buena transmisión de información, en forma clara, ordenada y carismática. Asimismo, todos tienen responsabilidades sobre clases, talleres, ateneos hospitalarios, enseñanza en escenarios clínicos o quirúrgicos, etc. Por ello, vemos un gran número de folios (44%) sobre estrategias de enseñanza entendidas como aquellas decisiones que toman los docentes al planear y llevar adelante sus tareas con el fin

de promover el aprendizaje de sus alumnos. En estos documentos se observa que a diferencia de sus preocupaciones iniciales se diversifican hacia diversos focos reflejados en la *Figura 1*.

Figura 1
Diversos focos de reflexión abordados en la temática estrategias de enseñanza



Como se observa en la *Figura 1*, los docentes se enfocan en cómo enseñar con *actividades de aprendizaje diversas* en sus clases (396 folios). También reflexionan sobre la *relación contenido / actividades* (141 folios), es decir el vínculo entre la naturaleza de los contenidos a construir por sus estudiantes y las actividades de aprendizaje propuestas.

En tercer lugar reflexionan sobre qué enseñar, *contenidos de sus clases*. Por último analizan quiénes sus los *destinatarios* de sus propuestas (39 folios).

Nos proponemos mirar más en detalle el foco en las actividades en la medida que evidencia la búsqueda por diversificar la tradicional clase expositiva mostrando un amplio abanico de actividades (ver figura 2).

La distribución de actividades muestra en primer lugar el *uso de casos* (162 folios), principalmente casos clínicos. Esto cobra sentido en términos epistemológicos, en la medida que el *caso* es el modelo prototípico de construcción de conocimientos en el campo de la salud y que permite traer al aula el ejercicio profesional donde "el paciente es un caso".

En segundo lugar, aparecen actividades vinculadas al *trabajo en grupos* (142 folios), otorgando relevancia al aprendizaje entre pares que no era parte del repertorio de trabajo previo a la formación.

Se observa en tercer lugar que se sostiene la *exposición* con una alta presencia (118 folios). Sin embargo es necesario destacar que casi la mitad de estos folios problematizan el uso de la exposición en clases ya realizadas expresando su inadecuación para ciertos objetivos y contenidos. El resto incluye la exposición argumentando en qué circunstancias resulta valioso introducir exposiciones dialógicas como parte de estrategias que incluyen otras tareas o actividades.

Figura 2
Actividades de aprendizaje que componen las estrategias de enseñanza

El foco en la *simulación* (79 folios) jerarquiza actividades acordes a la especificidad disciplinar en tanto se proponen enseñar competencias clínicas propias del ejercicio profesional. Se incluye aquí el juego de rol que permite a los estudiantes explorar aspectos integrales de su tarea asistencial. Con una ponderación similar (71 folios), la *resolución de problemas* (incluye aprendizaje basado en problemas-ABP) expresa esta misma búsqueda de actividades orientadas a los perfiles profesionales del campo.

Finalmente, el trabajo *plenario* para la puesta en común (57 folios) y el *uso de preguntas* (49 folios) son actividades que en combinación con otras evidencian la búsqueda de actividades que promuevan aprendizajes por parte de sus estudiantes desde una perspectiva socioconstructiva, dando lugar a la "voz" de los mismos en la construcción de conocimientos en los escenarios educativos.

Además de la frecuencia de aparición de cada una, estos datos permiten reconocer cómo al analizar prácticas ejercidas o proyectar nuevas, los docentes combinan diversas actividades para construir sus estrategias de enseñanza.

Del multiple choice al programa de evaluación

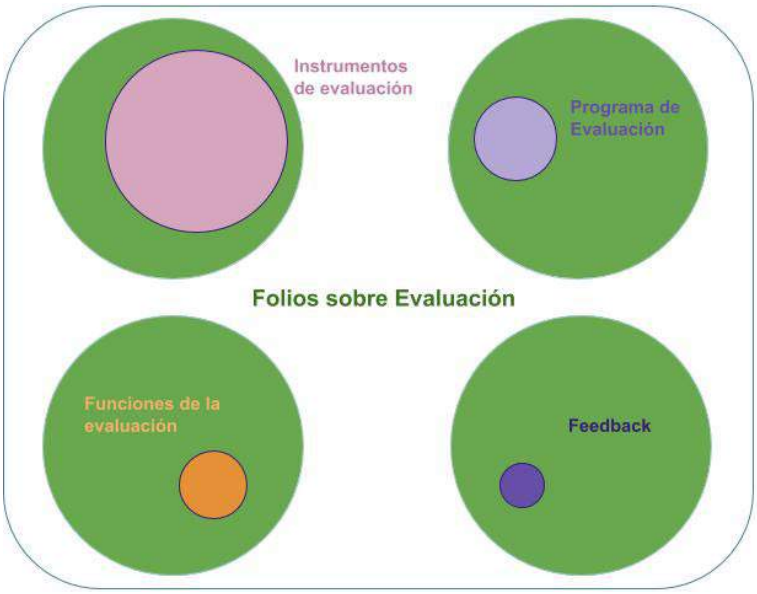
Esta segunda temática refleja la preocupación común a la mayoría de los docentes universitarios sobre cómo evaluar en forma objetiva. Al inicio de la formación la evaluación es asociada a la calificación, generalmente sumativa, y a la preocupación por los exámenes que utilizan como principales instrumentos (los multiple choice o "el oral") en los que buscan reconocer el dominio de conocimientos declarativos. Los 220 folios dedicados a este tema reflejan cómo los docentes comienzan a preguntarse por el sentido de evaluar y sus diversas funciones, así como también por la búsqueda de instrumentos más adecuados a los objetivos de aprendizaje establecidos en los programas, tal como muestra la *Figura 3* con los principales focos de reflexión en relación a esta temática.

La *Figura 3* evidencia como principal tendencia (153 folios) la reflexión sobre *instrumentos de evaluación*. Esto responde a la preocupación de los docentes por encontrar "herramientas" adecuadas para reconocer los aprendizajes de sus estudiantes y para poder acreditarlos.

El segundo foco, la elaboración de *programas de evaluación* (71 folios), muestra que los docentes comienzan a reconocer la necesidad de pensar integralmente la evaluación a través de instrumentos diversos, tomando decisiones consistentes con la planificación didáctica de un curso, asignatura, rotación, etc.

Figura 3

Diversos focos de reflexión abordados en la temática evaluación de los aprendizajes



En tercer lugar, encontramos documentos (57 folios) que reflexionan sobre la tarea de evaluar revisando las funciones de la evaluación y el sentido de la misma en el ejercicio de su rol educativo. Dentro de este foco, encontramos una particular atención (26 folios) a generar situaciones para la devolución de los exámenes en tanto instancias de aprendizaje para los estudiantes.

Finalmente, encontramos un cuarto foco que evidencia la reflexión situada en el campo disciplinar. Se trata de reflexiones que se enfocan en el *feedback* (37 folios) en tanto proceso fuertemente asociado a la evaluación del desempeño de los profesionales en contextos asistenciales.

Esta búsqueda respecto de la especificidad del campo de la salud se refleja también en la diversidad de instrumentos de evaluación, como expone la figura 4.

Figura 4

Instrumentos de evaluación de los aprendizajes presentes en los folios

Gran parte de estos 153 folios analiza los instrumentos usados o que proyectan utilizar con mayor rigor metodológico en la toma de decisiones. Consideran la adecuación a los objetivos del programa (qué deben aprender los estudiantes y, por lo tanto, qué debe evaluarse) y aspectos técnicos como validez, confiabilidad, economía de uso, impacto educacional y viabilidad.

En sintonía con *estrategias de enseñanza* que apuntan al desarrollo de competencias propias del campo, en primer lugar se observa el uso de instrumentos para la observación del desempeño profesional (62 folios), tales como lista de cotejo, Ocex, DPOS, Minicex. Algunos se utilizan para observar el desempeño en escenarios reales asistenciales y otros se implementan en contextos simulados, destacando entre estos últimos las reflexiones sobre el Examen Clínico Objetivo Estructurado (ECOE) que permiten evaluar el desempeño en contextos muy similares a los ámbitos asistenciales.

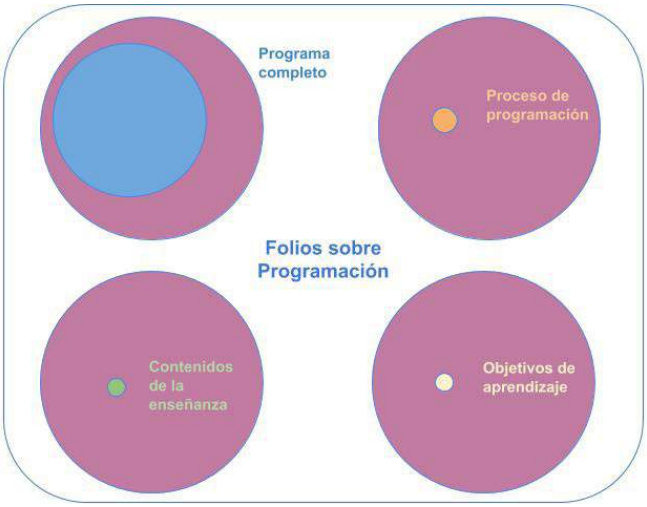
El segundo foco, evidencia la persistencia de exámenes escritos con pregunta cerrada (46 folios) (Multiple Choice, Respuestas breves, Key features). No obstante casi la mitad problematizan la falta de correspondencia con los contenidos a evaluar. El resto argumenta sobre diseños técnicamente bien resueltos pero mayormente buscan reconocer las particularidades de campos disciplinar apuntando a diseños enriquecidos con casos clínicos o instrumentos que evalúen el razonamiento clínico (mediante Key Features).

Los folios que reflexionan sobre el uso del Portfolio se presentan en tercer lugar y evidencian su interés por reconocer el proceso de aprendizaje en el mediano plazo. Finalmente, encontramos el examen oral (21 folios) y el examen escrito con preguntas a desarrollar (12 folios).

Del cronograma de temas al programa educativo

Esta tercera temática (15% de los folios) muestra el reconocimiento de una tarea que los docentes no percibían como parte de su campo de actuación o que se reducía a una actividad ritualizada de identificación del listado de temas dispuestos cronológicamente y con un orador a cargo. Se observa que los docentes avanzan sobre programas de grado o posgrado, de rotaciones en residencias y de actividades de formación continua en modalidad presencial o en línea. La *Figura 5* presenta los focos que surgen como tendencia al reflexionar sobre la programación.

Figura 5
Diversos focos de reflexión abordados en la temática programación educativa



Como tendencia principal se observa que los docentes abordan *programas completos* como documentos complejos, trascendiendo el cronograma para reconocer los múltiples componentes de los mismos (99 folios). En este foco encontramos docentes que analizan críticamente programas preexistentes y otros que avanzan en la elaboración de programas que incluyen la formulación de objetivos de aprendizaje, selección de contenidos, metodología, etc.

En segundo lugar encontramos docentes que reflexionan sobre el *proceso de programar* (16 folios). En la mayoría de estos textos se observa que destacan el trabajo en equipo en contraposición a una práctica solitaria identificando los desafíos enfrentados durante ese proceso.

Finalmente, se observan folios que hacen foco en los *contenidos* (12 folios) o en los *objetivos* (11 folios), incluyendo algunos que miran la relación entre ambos aspectos. En términos de selección, problematizan el listado de temas revisando concepciones enciclopedistas que intentan abarcar la "totalidad" del conocimiento disciplinar disponible discutiendo desde el binomio extensión/profundidad. Como principios de selección consideran diversos criterios como la identificación de contenidos dilemáticos o de aquellos con cierto nivel de consenso, la inclusión de problemáticas de salud con mayor prevalencia en el campo profesional, etc. Esta selección suele estar asociada a la organización y secuenciación incluyendo algunos casos que apuntan a la integración en contraposición a contenidos compartimentados. Muchos de los folios que enfocan en contenidos y objetivos consideran las competencias propias del campo profesional y el contexto curricular.

4. Discusión y conclusiones

El estudio detenido de portfolios de docentes universitarios de ciencias de la salud producidos en el contexto de un programa de formación pedagógica en servicio nos ha permitido identificar y caracterizar el contenido de las reflexiones escritas sobre sus prácticas docentes.

Como tendencia encontramos principalmente escritos que problematizan estrategias de enseñanza centradas en la transmisión y en los que diseñan actividades para sus estudiantes basadas en solución de problemas, análisis de casos, uso de simulaciones y role playing, aprendizaje colaborativo, etc. En segundo lugar reflexionan sobre la evaluación formativa y sumativa buscando instrumentos para evaluar competencias más que conocimientos. También revisan críticamente diseños curriculares y avanzan en nuevos programas centrados en objetivos y selección de contenidos en lugar de sólo proponer listados de temas organizados en un cronograma y en su mirada sobre los principios de selección de contenidos.

Así, mostramos el contenido de su reflexión al escribir sobre lo que piensan y hacen respecto de su actividad docente universitaria a través de un proceso sostenido en la producción de un portfolio transversal a la formación. Así, la reflexión sobre la práctica es representada y puede ser vista y acompañada por otros. Esta posibilidad de materializar la reflexión también es una oportunidad para que los formadores guien los aprendizajes (Groom y Maunonen-Eskelinen, 2006). Esto permite reorganizar la experiencia para su análisis y enfocar la dirección del desarrollo profesional de los docentes considerando que no todas las experiencias se convertirán en objeto de análisis. Es parte del proceso lograr una adecuada selección de las mismas que resulten significativas en su formación.

El estudio sobre el contenido de las reflexiones, sobre sus prácticas docentes tematizadas y revisadas a la luz de teorías pedagógicas, evidencia el valor de un programa de formación que propone profesionalizar la tarea universitaria y transferir lo aprendido a sus tareas como

profesores en ciencias de la salud. A la vez, permite reconocer que la formación lleva a los docentes a transformarse y a transformar la propia realidad, a construir una identidad que trasciende el "dar clase". Implica pensar y pensarse, trabajar desde la experiencia y lograr que los conceptos sean herramientas con las que problematizarla y pensar alternativas.

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Problematizar, Diseñar y Valorar. Acciones reflexivas para mejorar la tarea docente

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Abstract

Reflecting on self-practice is the starting and ending point for the continuous improvement of any professional activity. So, how do university teachers reflect on their activity? For example, what do they do when they think about how and what they teach or assess? Numerous researches value the presence of reflection in teacher training programmes and identify the use of writing and portfolios as devices that promote a reflective practice . Some of these publications also distinguish different levels of depth in this practice. But none of them describe what reflective actions take place when teachers reflect on their performance. In this study, we characterize the reflective actions university teachers of health sciences produce in portfolios written in the context of a two-year teacher training program. We analyze 965 written texts by 175 teachers in training during 2007-2016, using a qualitative descriptive-interpretative approach. In these documents, we identified four types of reflective actions that teachers use: problematize, appreciate, design and re-conceptualize. It has been identified that, in their development as university teaching professionals, they primarily problematize practices that had been reproduced without being previously criticized (39%), they recognize valuable educational activities using pedagogical criteria (37%), they design alternatives (22%) to their teaching strategies, programme designs, learning assessments, learning management, etc. This study reveals that reflective professionals problematize, appreciate and design alternatives for their working environment. Showing that university teaching training programs need to educate by way of reflecting on teaching and learning from an academic focus on actual situations taking place in their daily practice. To summarize, in order to transform teaching in universities, reflection should be the way to and purpose of teacher training programmes.

Resumen

La reflexión sobre la propia práctica es el punto de partida y de llegada para la mejora permanente en el ejercicio profesional. ¿Cómo reflexionan sobre su tarea los docentes universitarios? Por ejemplo, ¿qué hacen cuando piensan sobre cómo y qué enseñan o evalúan? Múltiples investigaciones plantean el valor de la reflexión en la formación de docentes e identifican a la escritura y el uso del portfolio como herramientas para promover la práctica reflexiva. Algunos de estos estudios distinguen niveles de profundidad de la práctica reflexiva. Sin embargo no definen cuáles son específicamente las acciones reflexivas, es decir, en qué consisten esas reflexiones de los docentes al mirar su propio desempeño. En este trabajo caracterizamos las acciones reflexivas ejercidas por docentes universitarios en ciencias de la salud cuando escriben un portfolio en el contexto de un programa de formación pedagógica en servicio de dos años. Mediante un estudio cualitativo descriptivo-interpretativo analizamos las 965 producciones escritas de 175 docentes en formación durante 2007-2016. Identificamos que los docentes ejercen en estos documentos cuatro acciones reflexivas: problematizar, diseñar, valorar y reconceptualizar. Es decir, al desarrollarse como profesionales de la enseñanza universitaria, en forma prevalente, problematizan prácticas que se reproducen acríticamente (39%), reconocen desde criterios pedagógicos las propuestas educativas valiosas (37%) y diseñan alternativas superadoras (22%) sobre sus estrategias de enseñanza, la construcción de programas, la evaluación de los aprendizajes, la gestión educativa, entre otros. Este estudio revela que problematizar, valorar y diseñar alternativas para sus contextos son las acciones que llevan adelante los profesionales reflexivos. Con esto, se muestra que la profesionalización de los docentes universitarios requiere un programa que los forme mediante la reflexión sobre situaciones reales desde un enfoque académico de la enseñanza y el aprendizaje. En suma, la reflexión es medio y propósito de la formación profesional docente, para transformar y mejorar concomitantemente la enseñanza en las universidades.

1. Introducción

Muchos docentes del campo de ciencias de la salud, al igual que en otras carreras universitarias (Derecho, Ingenierías, etc.), no poseen una formación sistemática para ejercer como profesores (Anijovich, Cappelletti, Mora y Sabelli, 2009; Tardif, 2004). Pensar esta formación presenta la paradoja de ser inicial y a la vez en ejercicio. Inicial, en tanto para la mayoría es una primera aproximación sistemática a la formación pedagógica, y en ejercicio, porque ya están desarrollando tareas docentes con valiosos años de experiencia. Entonces, debe ofrecerse una aproximación a conocimientos validados científicamente sobre la educación en el nivel superior y reconocer, al mismo tiempo, las prácticas educativas y saberes que ya poseen.

Hemos reconocido tres características para encarar una formación docente en ciencias de la salud. La primera, es que los docentes mayormente reproducen acríticamente prácticas que aprendieron en su propia biografía como estudiantes y en sus procesos de socialización iniciales (Alliaud, 1998, Terhart, 1987). La segunda, que sus prácticas en gran medida se desarrollan en contextos de ejercicio profesional (consultorios, quirófanos, etc.) que no suelen ser conceptualizadas como tales (Schwartzman, Eder y Roni, 2014). Por último, la enseñanza no es su ocupación principal, y probablemente tampoco lo sea en el futuro, pero su práctica profesional (en medicina, enfermería, odontología, kinesiología, etc.) da sentido a la tarea de enseñanza. Por todo esto, es necesario movilizar aspectos identitarios para que también se reconozcan a sí mismos como trabajadores de la educación (Contreras, 2010).

Como se mencionó previamente, es necesario trabajar sobre las concepciones y prácticas de los docentes y para ello la escritura reflexiva se presenta como una herramienta privilegiada (Schön, 1991; Perrenoud, 2004; Domingo y Anijovich, 2017). La reflexión ocurre antes, durante y después de situaciones para lograr una mayor comprensión de la situación y de sí mismos (Sandars, 2009). En este proceso se pone en consideración los fundamentos de acciones o creencias en forma sistemática y rigurosa (Dewey, 1938). La escritura es un medio para explicitar y sistematizar esa reflexión sobre las prácticas docentes (Davini, 2015) y permite objetivarla para sí mismos y para ser considerada por otros (Brown, 2003 en Klenowski, Askew y Carnell, 2006; Moon, 2007). Un dispositivo para darle continuidad y profundidad a ese proceso de análisis y reflexión escrita es el Portfolio (Moon, 2007, Groom y Maunonen-Eskelinen, 2006; Carlino, 2010). Un Portfolio es una colección de ejemplos de trabajo que evidencia logros, transformaciones, preocupaciones, desafíos, decisiones y aprendizajes de sus autores a lo largo de un periodo de tiempo (Groom, Maunonen-Eskelinen, 2006).

Las investigaciones sobre reflexión escrita en la formación docente aportan al menos tres grandes conjuntos de resultados. En primer lugar, dan cuenta de cómo promover esa reflexión y aluden a un proceso, a una necesaria recursividad, a etapas o diferentes instancias, participantes involucrados, etc. (Groom, Maunonen-Eskelinen, 2006; Larrivee, 2008; Sandars, 2009; Van Manen, 1977). En segundo lugar, identifican cuáles son los resultados de esta reflexión, tales como empoderamiento, autorregulación, resolución de problemas, aprendizaje, etc. (Groom, Maunonen-Eskelinen, 2006; Klenowski, Askew y Carnell, 2006; Moon, 2007; Sandars, 2009). En tercer lugar, distinguen niveles de profundidad de esa práctica reflexiva (Day, 1993, Farrell, 2004; Handal y Lauvas, 1987; Jay y Johnson, 2002; Larrivee, 2008, 2013; Van Manen, 1977). Este último aporte brinda información específica sobre las características de las reflexiones, es decir, ya no sobre cómo promoverlas o sobre sus consecuencias, sino que avanzan en especificar en qué consisten. Algunos autores establecen tres niveles de reflexión —inicial, avanzado y alto—, mientras que Larrivee (2008) propone cuatro —pre-reflexivo, superficial, pedagógico y crítico—. Sin embargo las investigaciones antecedentes no precisan qué hacen los docentes cuando escriben reflexivamente, cómo relacionan concep-

ciones, teorías y prácticas, es decir, cuáles son específicamente las *acciones reflexivas* que los docentes ejercen al mirar su propia actividad y escribir sobre ella. Por ello nos preguntamos cómo reflexionan sobre su tarea los docentes universitarios en ciencias de la salud.

Este trabajo presenta las acciones reflexivas ejercidas por escrito por profesionales de las ciencias de la salud durante un Programa de Posgrado en Docencia Universitaria de dos años de duración en el marco del cual producen un Portfolio. Definimos acción reflexiva a la forma en que se pone en acto la tarea de reflexionar, dentro de la actividad de elaboración de un Portfolio. Este objeto de estudio se constituye en nuestra unidad de análisis teórica más nuclear. Al identificar las diferentes formas de acción reflexiva caracterizamos cómo reflexionan los docentes en formación al escribir sobre su propio trabajo en la universidad.

2. Metodología

Esta investigación fue desarrollada en un Instituto Universitario de la Ciudad de Buenos Aires (Argentina) orientado al campo de la salud en los niveles de grado (medicina, enfermería, bioquímica, etc.), posgrado (maestrías, doctorados y formación continua) así como de especializaciones en servicio a través del sistema de residencias hospitalarias. En este contexto se llevaron adelante, entre 2007 y 2016, nueve ediciones de un Programa de formación pedagógica destinado a los docentes de la universidad. Este Programa se vuelve un caso de interés para estudiar la formación de docentes reflexivos, ya que se propone: *1. Propiciar la reflexión sobre la práctica docente para desarrollar una mirada crítica de los participantes. 2. Promover procesos de mejora de la práctica docente*. Los participantes deben elaborar un portfolio con seis folios en los que relatan y reflexionan sobre práctica docente habitual. Las consignas de producción establecen incluir un folio referido a programación, otro a evaluación y uno a estrategias de enseñanza. Los restantes pueden reiterar estas temáticas o enfocar otras referidas a la docencia universitaria. En el proceso de escritura de los folios, los profesores seleccionan una práctica de su tarea docente, la narran y operan sobre el relato de modo de reflexionar sobre esta práctica a través de acciones reflexivas, objeto de estudio del presente trabajo.

Para esta investigación realizamos un estudio descriptivo-interpretativo, con un enfoque cualitativo, centrado en los portfolios de los participantes del mencionado Programa. Para analizarlos utilizamos la técnica del análisis documental y como instrumento una matriz de registro. Tomamos como unidad de análisis metodológica cada uno de los 965 folios, elaborados por 175 docentes en formación.

La matriz utilizada para procesar los datos fue construida en sucesivas aproximaciones a partir de un tratamiento inicial de los documentos para estabilizar las dimensiones de análisis y los códigos correspondientes a cada una de éstas. Esta matriz permitió dar cuenta de tres rasgos de cada folio: 1. el contexto específico de la práctica narrada (nivel educativo, modalidad, marco curricular, etc.), 2. las temáticas abordadas por los docentes cuando reflexionan sobre sus prácticas[1], y 3. las acciones reflexivas desplegadas en el proceso de escritura. La cuantificación de los códigos registrados en la matriz permite reconocer las características más extendidas y más inusuales de las escrituras reflexivas de los docentes con la finalidad de aportar mayor sustento empírico a las interpretaciones.

[1] Presentamos resultados referidos a *las temáticas de los folios* en otra ponencia que también forma parte de esta edición 2019 de EuroSoTL, titulada: "Perspectiva académica de la enseñanza del profesorado universitario: sobre qué prácticas reflexionan los docentes a partir de su formación".

El procedimiento de análisis siguió una estrategia categorizadora (Maxwell, 2008) llevada adelante por dos equipos de analistas, uno con miembros no pertenecientes al Programa de formación y luego con otros que sí forman parte del mismo (en calidad de docentes). Para elaborar la implicación personal y evitar sesgos durante el proceso de construcción de la matriz y de codificación se procuró un trabajo de interjueces.

3. Resultados

Identificamos que los docentes universitarios de ciencias de la salud en formación ejercieron cuatro acciones reflexivas: *valorar*, *problematizar*, *diseñar* y *reconceptualizar* sus prácticas. Estas acciones reflexivas, solas o combinadas, fueron ejercidas durante la actividad de escribir los folios a lo largo de los dos años del programa de formación docente. A continuación las definiremos e ilustraremos con referentes empíricos y luego presentaremos su porcentaje de presencia de los mismos.

La *valoración* es una acción reflexiva que considera cómo resultó una práctica (dar una clase, organizar una reunión de trabajo con el equipo docente, implementar una modificación en un programa de evaluación, etc.) que ya fue ejercida en un pasado reciente, previo a la formación docente o en ocasión de ésta, a través de destacar sus aspectos positivos. La práctica que se analiza resulta para ellos un caso de éxito, algo para exponer y explicar con fundamentos conceptuales. Así, la justifican y cualifican como valiosa desde los marcos conceptuales pedagógicos, para reconocer los rasgos que las hicieron preciadas para inspirar a otros docentes, para transferir los criterios con los que fueron construidas a otras situaciones, por ejemplo.

Ilustramos, en la página siguiente, cómo ejerce la *valoración* un docente de la carrera de Medicina a través de un fragmento de folio LG08-2:

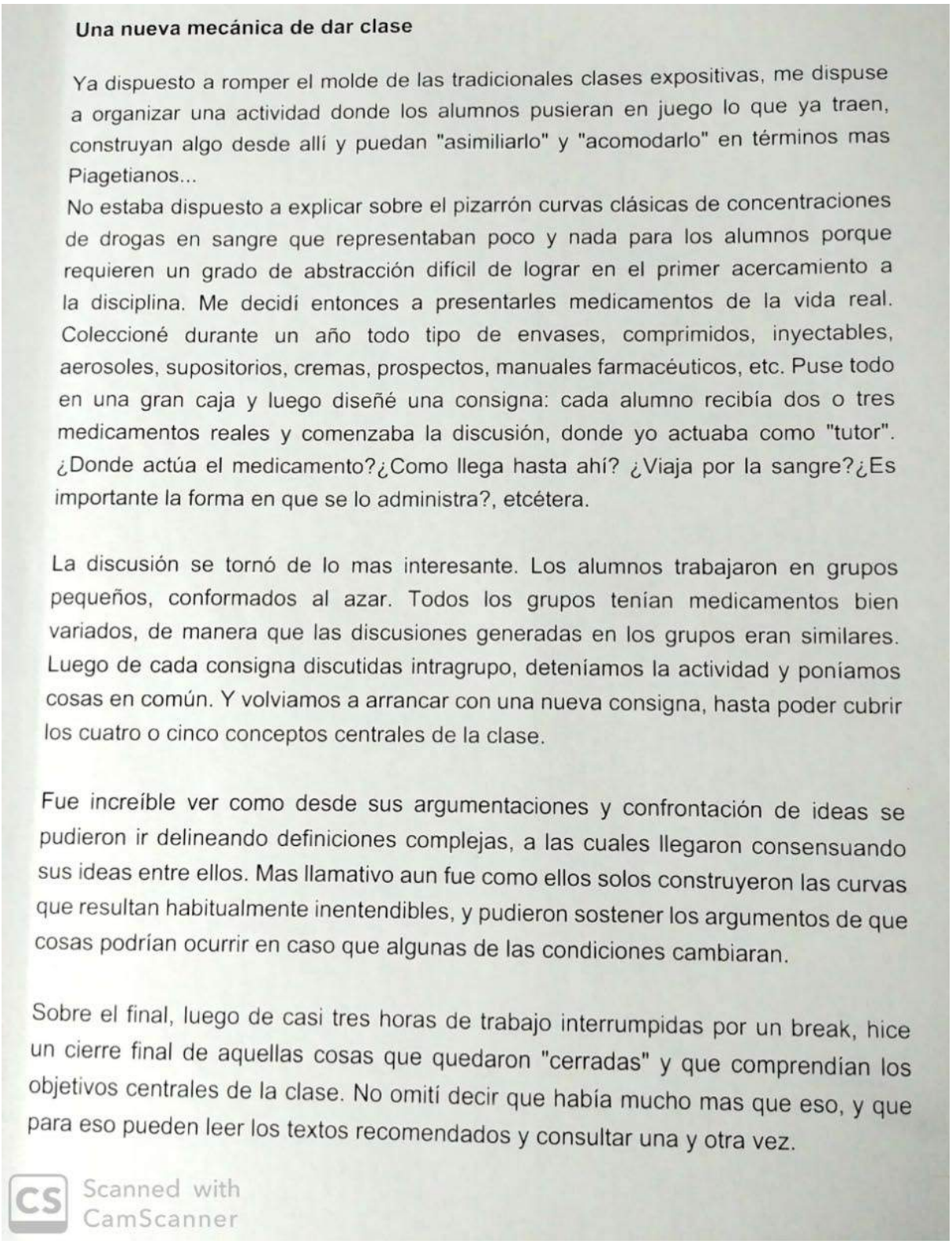
La Fig. 1 muestra cómo un docente expone las cambios introducidos en su clase sobre medicamentos con el fin de evitar la exposición de información y favorecer la construcción de conocimientos por sus estudiantes. Para ello da cuenta de las consignas que definió, sus intervenciones docentes, las actividades que los estudiantes pudieron producir, etc. En su escritura realiza un énfasis en los criterios pedagógicos que orientaron estas decisiones (“poner en juego lo que [los alumnos] ya traen”, “que construyan desde ahí”; “volvíamos a arrancar hasta cubrir los cuatro o cinco conceptos centrales de la clase”) y los resultados que produjeron (“la argumentación y confrontación de las ideas pudieron ir delineando definiciones complejas”). Para este docente esta clase y los criterios que la justificaron se constituyeron así en un caso valioso que vale la pena exponer y tener en cuenta.

Problematizar implica identificar una situación de la práctica docente que preocupa o incomoda y argumentar los motivos de esa disconformidad. Puede originarse al reconocer una práctica que los preocupa y reflexionan sobre ella desde los marcos teóricos que están aprendiendo para comprender por qué no resultó adecuada o presentó dificultades. O bien, puede surgir al reconocer un aporte conceptual de la formación percibido como novedoso y desde el cual miran su propia experiencia. En estos casos realizan disquisiciones sobre ese tema y examinan su práctica, identificando situaciones concretas que merecen ser revisadas.

Esta acción alcanza mayor profundidad cuando, no sólo enuncian un concepto y relatan la práctica, sino que relacionan explícitamente concepto y práctica elaborando explicaciones. A continuación exponemos un fragmento del folio MR11-2 que ilustra esta acción reflexiva:

Figura 1

Fragmento de folio en el que un docente de la Carrera de Medicina ejerce la acción reflexiva valorar sobre una clase dada



Una nueva mecánica de dar clase

Ya dispuesto a romper el molde de las tradicionales clases expositivas, me dispuse a organizar una actividad donde los alumnos pusieran en juego lo que ya traen, construyan algo desde allí y puedan "asimiliarlo" y "acomodarlo" en términos mas Piagetianos...
No estaba dispuesto a explicar sobre el pizarrón curvas clásicas de concentraciones de drogas en sangre que representaban poco y nada para los alumnos porque requieren un grado de abstracción difícil de lograr en el primer acercamiento a la disciplina. Me decidí entonces a presentarles medicamentos de la vida real. Coleccioné durante un año todo tipo de envases, comprimidos, inyectables, aerosoles, supositorios, cremas, prospectos, manuales farmacéuticos, etc. Puse todo en una gran caja y luego diseñé una consigna: cada alumno recibía dos o tres medicamentos reales y comenzaba la discusión, donde yo actuaba como "tutor". ¿Donde actúa el medicamento?¿Como llega hasta ahí? ¿Viaja por la sangre?¿Es importante la forma en que se lo administra?, etcétera.

La discusión se tornó de lo mas interesante. Los alumnos trabajaron en grupos pequeños, conformados al azar. Todos los grupos tenían medicamentos bien variados, de manera que las discusiones generadas en los grupos eran similares. Luego de cada consigna discutidas intragrupo, deteníamos la actividad y poníamos cosas en común. Y volviamos a arrancar con una nueva consigna, hasta poder cubrir los cuatro o cinco conceptos centrales de la clase.

Fue increíble ver como desde sus argumentaciones y confrontación de ideas se pudieron ir delineando definiciones complejas, a las cuales llegaron consensuando sus ideas entre ellos. Mas llamativo aun fue como ellos solos construyeron las curvas que resultan habitualmente inentendibles, y pudieron sostener los argumentos de que cosas podrían ocurrir en caso que algunas de las condiciones cambiaran.

Sobre el final, luego de casi tres horas de trabajo interrumpidas por un break, hice un cierre final de aquellas cosas que quedaron "cerradas" y que comprendían los objetivos centrales de la clase. No omití decir que había mucho mas que eso, y que para eso pueden leer los textos recomendados y consultar una y otra vez.

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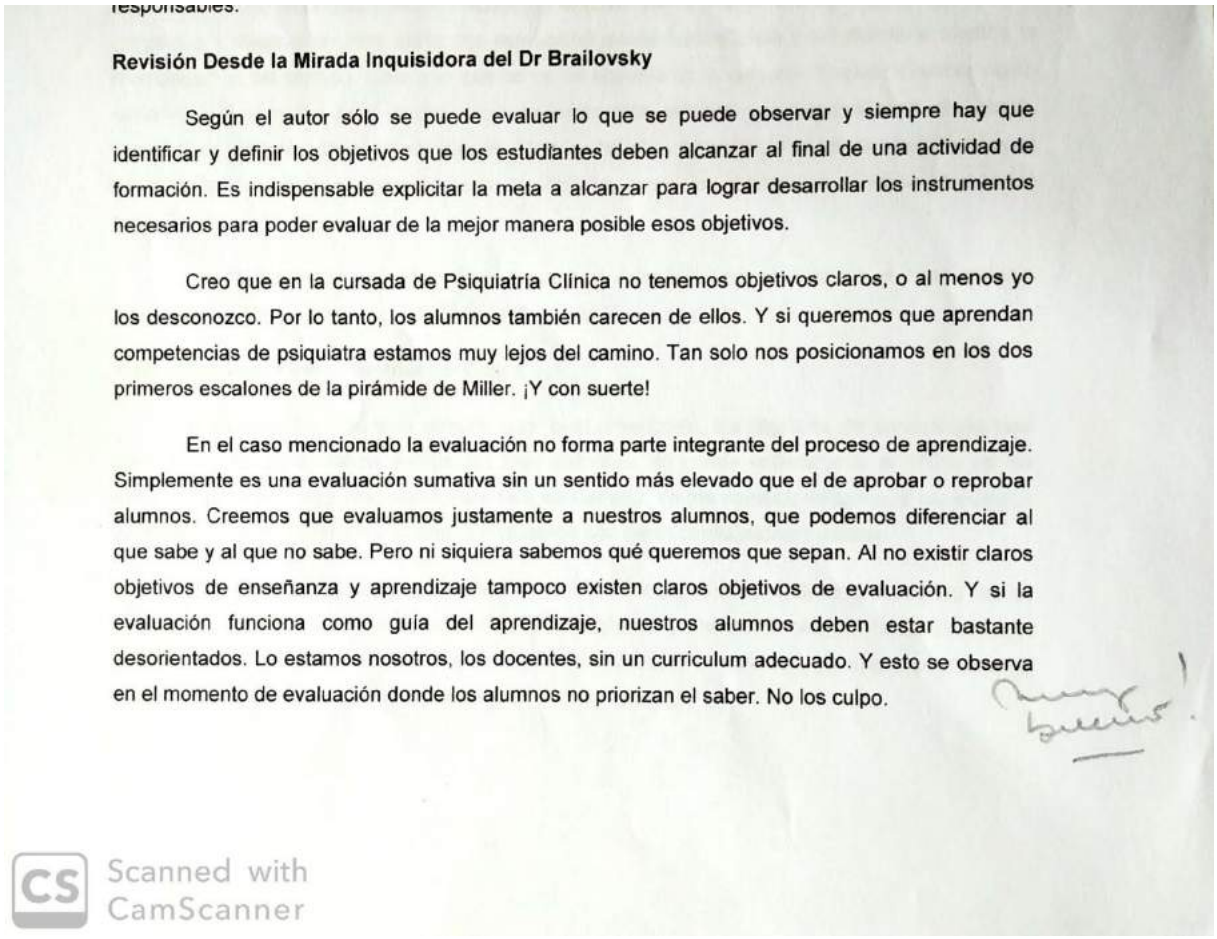
Figura 2
Fragmento de folio en el que un docente de Psiquiatría ejerce la acción reflexiva problematizar sobre un programa de evaluación



responsables.

Revisión Desde la Mirada Inquisidora del Dr Brailovsky

Según el autor sólo se puede evaluar lo que se puede observar y siempre hay que identificar y definir los objetivos que los estudiantes deben alcanzar al final de una actividad de formación. Es indispensable explicitar la meta a alcanzar para lograr desarrollar los instrumentos necesarios para poder evaluar de la mejor manera posible esos objetivos.

Creo que en la cursada de Psiquiatría Clínica no tenemos objetivos claros, o al menos yo los desconozco. Por lo tanto, los alumnos también carecen de ellos. Y si queremos que aprendan competencias de psiquiatra estamos muy lejos del camino. Tan solo nos posicionamos en los dos primeros escalones de la pirámide de Miller. ¡Y con suerte!

En el caso mencionado la evaluación no forma parte integrante del proceso de aprendizaje. Simplemente es una evaluación sumativa sin un sentido más elevado que el de aprobar o reprobar alumnos. Creemos que evaluamos justamente a nuestros alumnos, que podemos diferenciar al que sabe y al que no sabe. Pero ni siquiera sabemos qué queremos que sepan. Al no existir claros objetivos de enseñanza y aprendizaje tampoco existen claros objetivos de evaluación. Y si la evaluación funciona como guía del aprendizaje, nuestros alumnos deben estar bastante desorientados. Lo estamos nosotros, los docentes, sin un curriculum adecuado. Y esto se observa en el momento de evaluación donde los alumnos no priorizan el saber. No los culpo.

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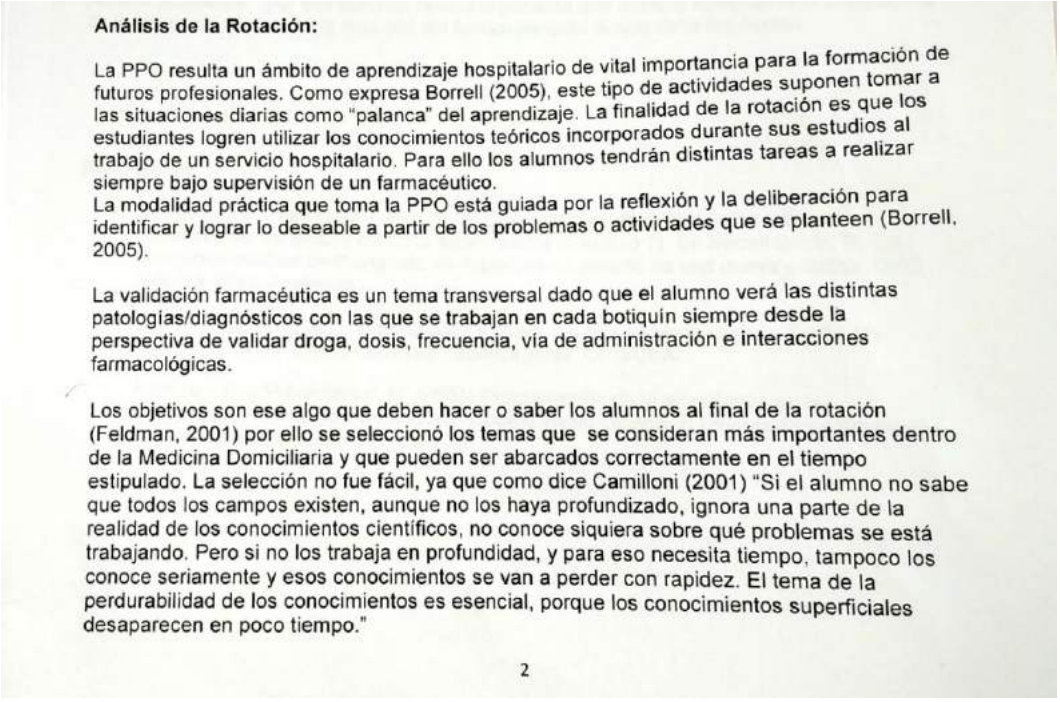
La Fig. 2 ilustra cómo la *problematización* surge de identificar un aporte conceptual de la bibliografía sobre evaluación de los aprendizajes y le permite al docente mirar críticamente su experiencia. Al tomar el concepto *objetivos de aprendizaje,* reconoce que las acciones de evaluación en su materia en el campo de la salud mental no se guían por los mismos. Esto le permite pensar que sus estudiantes están desorientados, problema de su práctica habitual de evaluación y en consecuencia de enseñanza.

En tercer lugar, encontramos que los docentes *diseñan* alternativas acción en respuesta a una necesidad o problema. En estas escrituras van más allá de principios generales y avanzan en la planificación de una práctica específica (diseñan un instrumento de evaluación, un programa, actividades de una clase, etc.). En algunos casos, esta reflexión surge de *problematizar*, en otros resulta de identificar una práctica no desarrollada aún. El diseño siempre implica una práctica a futuro que aún no fue ejercida y puede estar más o menos justificado a través de una fundamentación conceptual. En la Fig. 3 mostramos un extracto del folio TV15-5 que ejemplifica esta acción reflexiva de *diseñar*:

Figura 3

Fragmentos de folio en el que una docente de Farmacia ejerce la acción reflexiva diseñar sobre un programa de una rotación hospitalaria



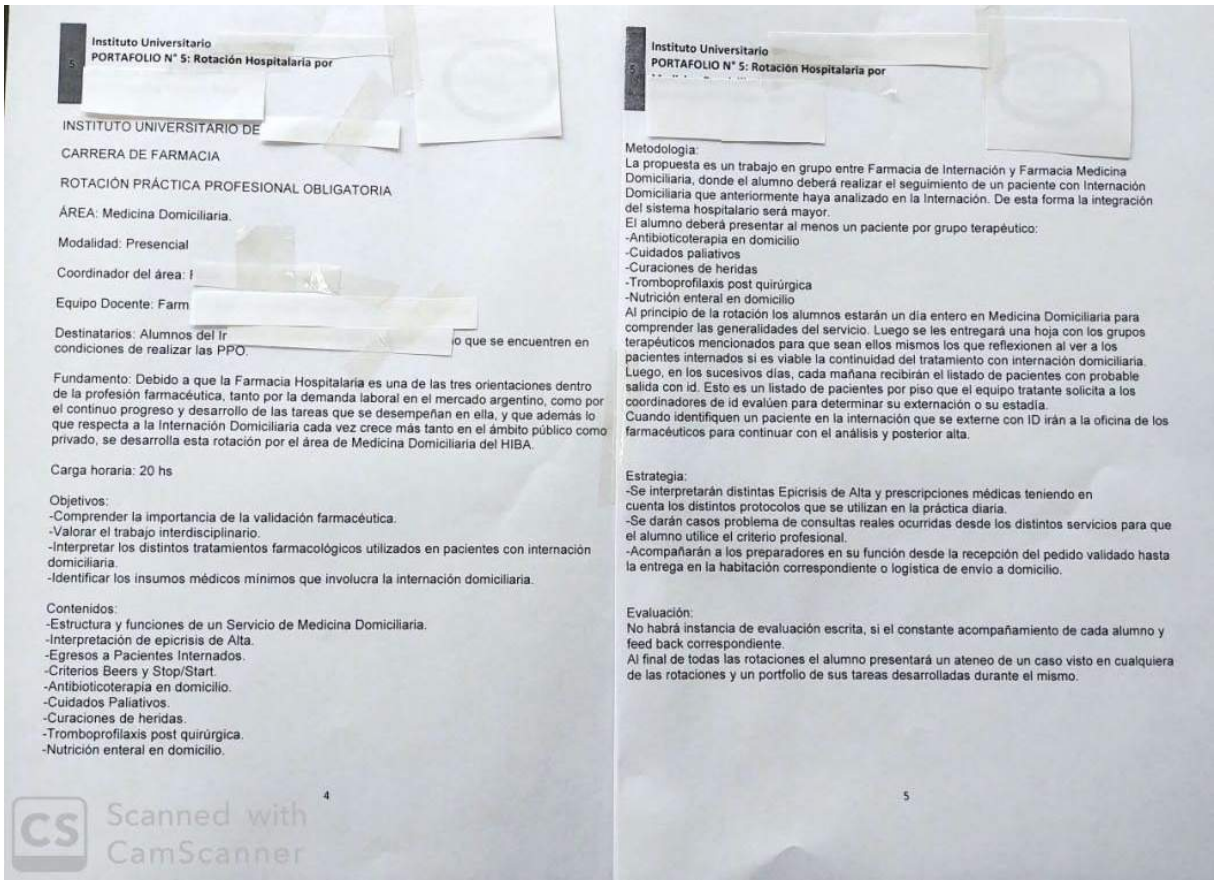
Análisis de la Rotación:

La PPO resulta un ámbito de aprendizaje hospitalario de vital importancia para la formación de futuros profesionales. Como expresa Borrell (2005), este tipo de actividades suponen tomar a las situaciones diarias como "palanca" del aprendizaje. La finalidad de la rotación es que los estudiantes logren utilizar los conocimientos teóricos incorporados durante sus estudios al trabajo de un servicio hospitalario. Para ello los alumnos tendrán distintas tareas a realizar siempre bajo supervisión de un farmacéutico.
La modalidad práctica que toma la PPO está guiada por la reflexión y la deliberación para identificar y lograr lo deseable a partir de los problemas o actividades que se planteen (Borrell, 2005).

La validación farmacéutica es un tema transversal dado que el alumno verá las distintas patologías/diagnósticos con las que se trabajan en cada botiquín siempre desde la perspectiva de validar droga, dosis, frecuencia, vía de administración e interacciones farmacológicas.

Los objetivos son ese algo que deben hacer o saber los alumnos al final de la rotación (Feldman, 2001) por ello se seleccionó los temas que se consideran más importantes dentro de la Medicina Domiciliaria y que pueden ser abarcados correctamente en el tiempo estipulado. La selección no fue fácil, ya que como dice Camilloni (2001) "Si el alumno no sabe que todos los campos existen, aunque no los haya profundizado, ignora una parte de la realidad de los conocimientos científicos, no conoce siquiera sobre qué problemas se está trabajando. Pero si no los trabaja en profundidad, y para eso necesita tiempo, tampoco los conoce seriamente y esos conocimientos se van a perder con rapidez. El tema de la perdurabilidad de los conocimientos es esencial, porque los conocimientos superficiales desaparecen en poco tiempo."

2



Instituto Universitario
PORTAFOLIO N° 5: Rotación Hospitalaria por

INSTITUTO UNIVERSITARIO DE
CARRERA DE FARMACIA
ROTACIÓN PRÁCTICA PROFESIONAL OBLIGATORIA
ÁREA: Medicina Domiciliaria.
Modalidad: Presencial
Coordinador del área: I
Equipo Docente: Farm
Destinatarios: Alumnos del Ir o que se encuentren en condiciones de realizar las PPO.

Fundamento: Debido a que la Farmacia Hospitalaria es una de las tres orientaciones dentro de la profesión farmacéutica, tanto por la demanda laboral en el mercado argentino, como por el continuo progreso y desarrollo de las tareas que se desempeñan en ella, y que además lo que respecta a la Internación Domiciliaria cada vez crece más tanto en el ámbito público como privado, se desarrolla esta rotación por el área de Medicina Domiciliaria del HIBA.

Carga horaria: 20 hs

Objetivos:
-Comprender la importancia de la validación farmacéutica.
-Valorar el trabajo interdisciplinario.
-Interpretar los distintos tratamientos farmacológicos utilizados en pacientes con internación domiciliaria.
-Identificar los insumos médicos mínimos que involucra la internación domiciliaria.

Contenidos:
-Estructura y funciones de un Servicio de Medicina Domiciliaria.
-Interpretación de epicrisis de Alta.
-Egresos a Pacientes Internados.
-Criterios Beers y Stop/Start.
-Antibioticoterapia en domicilio.
-Cuidados Paliativos.
-Curaciones de heridas.
-Tromboprofilaxis post quirúrgica.
-Nutrición enteral en domicilio.

4

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Instituto Universitario
PORTAFOLIO N° 5: Rotación Hospitalaria por

Metodología:
La propuesta es un trabajo en grupo entre Farmacia de Internación y Farmacia Medicina Domiciliaria, donde el alumno deberá realizar el seguimiento de un paciente con Internación Domiciliaria que anteriormente haya analizado en la Internación. De esta forma la integración del sistema hospitalario será mayor.
El alumno deberá presentar al menos un paciente por grupo terapéutico:
-Antibioticoterapia en domicilio
-Cuidados paliativos
-Curaciones de heridas
-Tromboprofilaxis post quirúrgica
-Nutrición enteral en domicilio
Al principio de la rotación los alumnos estarán un día entero en Medicina Domiciliaria para comprender las generalidades del servicio. Luego se les entregará una hoja con los grupos terapéuticos mencionados para que sean ellos mismos los que reflexionen al ver a los pacientes internados si es viable la continuidad del tratamiento con internación domiciliaria. Luego, en los sucesivos días, cada mañana recibirán el listado de pacientes con probable salida con id. Esto es un listado de pacientes por piso que el equipo tratante solicita a los coordinadores de id evalúen para determinar su externación o su estadía.
Cuando identifiquen un paciente en la internación que se externe con ID irán a la oficina de los farmacéuticos para continuar con el análisis y posterior alta.

Estrategia:
-Se interpretarán distintas Epicrisis de Alta y prescripciones médicas teniendo en cuenta los distintos protocolos que se utilizan en la práctica diaria.
-Se darán casos problema de consultas reales ocurridas desde los distintos servicios para que el alumno utilice el criterio profesional.
-Acompañarán a los preparadores en su función desde la recepción del pedido validado hasta la entrega en la habitación correspondiente o logística de envío a domicilio.

Evaluación:
No habrá instancia de evaluación escrita, si el constante acompañamiento de cada alumno y feed back correspondiente.
Al final de todas las rotaciones el alumno presentará un ateneo de un caso visto en cualquiera de las rotaciones y un portfolio de sus tareas desarrolladas durante el mismo.

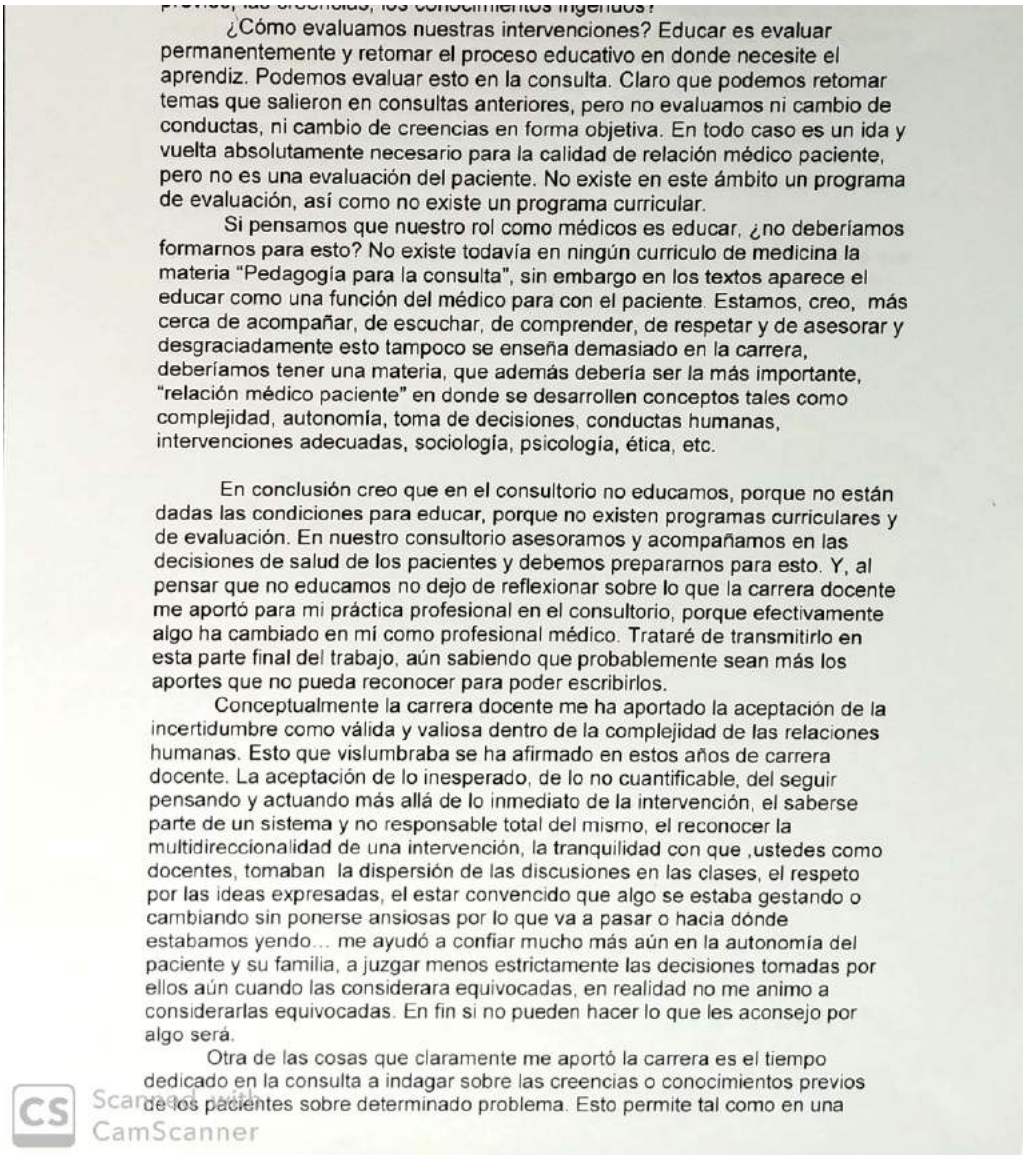
5

La Fig. 3 corresponde a tres fragmentos del folio de una docente que *diseña* el programa de una rotación hospitalaria de la carrera de Farmacia. Comienza exponiendo el sustento conceptual de sus decisiones ("tomar las situaciones diarias para el aprendizaje", "que la práctica esté guiada por la reflexión", entre otros) que se tradujeron en el Programa confeccionado por ella.

Por último, algunos docentes *reconceptualizan*, es decir toman ideas educativas y las repiensan de forma situada a sus contextos de desempeño disciplinar y en ejercicio del rol docente. Realizan así un aporte a su práctica y una conceptualización en cierta medida novedosa. Si bien, no surgen de un proceso de investigación sistemática alcanzan un nivel de generalización que permite trascender la práctica concreta y hacer un aporte a la enseñanza en su disciplina. La ejemplificamos a continuación:

Figura 4

Fragmentos de folio en el que un docente de pediatría ejerce la acción reflexiva reconceptualizar sobre si el profesional de salud enseña en el consultorio



¿Cómo evaluamos nuestras intervenciones? Educar es evaluar permanentemente y retomar el proceso educativo en donde necesite el aprendiz. Podemos evaluar esto en la consulta. Claro que podemos retomar temas que salieron en consultas anteriores, pero no evaluamos ni cambio de conductas, ni cambio de creencias en forma objetiva. En todo caso es un ida y vuelta absolutamente necesario para la calidad de relación médico paciente, pero no es una evaluación del paciente. No existe en este ámbito un programa de evaluación, así como no existe un programa curricular.

Si pensamos que nuestro rol como médicos es educar, ¿no deberíamos formarnos para esto? No existe todavía en ningún curriculo de medicina la materia "Pedagogía para la consulta", sin embargo en los textos aparece el educar como una función del médico para con el paciente. Estamos, creo, más cerca de acompañar, de escuchar, de comprender, de respetar y de asesorar y desgraciadamente esto tampoco se enseña demasiado en la carrera, deberíamos tener una materia, que además debería ser la más importante, "relación médico paciente" en donde se desarrollen conceptos tales como complejidad, autonomía, toma de decisiones, conductas humanas, intervenciones adecuadas, sociología, psicología, ética, etc.

En conclusión creo que en el consultorio no educamos, porque no están dadas las condiciones para educar, porque no existen programas curriculares y de evaluación. En nuestro consultorio asesoramos y acompañamos en las decisiones de salud de los pacientes y debemos prepararnos para esto. Y, al pensar que no educamos no dejo de reflexionar sobre lo que la carrera docente me aportó para mi práctica profesional en el consultorio, porque efectivamente algo ha cambiado en mí como profesional médico. Trataré de transmitirlo en esta parte final del trabajo, aún sabiendo que probablemente sean más los aportes que no pueda reconocer para poder escribirlos.

Conceptualmente la carrera docente me ha aportado la aceptación de la incertidumbre como válida y valiosa dentro de la complejidad de las relaciones humanas. Esto que vislumbraba se ha afirmado en estos años de carrera docente. La aceptación de lo inesperado, de lo no cuantificable, del seguir pensando y actuando más allá de lo inmediato de la intervención, el saberse parte de un sistema y no responsable total del mismo, el reconocer la multidireccionalidad de una intervención, la tranquilidad con que ,ustedes como docentes, tomaban la dispersión de las discusiones en las clases, el respeto por las ideas expresadas, el estar convencido que algo se estaba gestando o cambiando sin ponerse ansiosas por lo que va a pasar o hacia dónde estabamos yendo... me ayudó a confiar mucho más aún en la autonomía del paciente y su familia, a juzgar menos estrictamente las decisiones tomadas por ellos aún cuando las considerara equivocadas, en realidad no me animo a considerarlas equivocadas. En fin si no pueden hacer lo que les aconsejo por algo será.

Otra de las cosas que claramente me aportó la carrera es el tiempo dedicado en la consulta a indagar sobre las creencias o conocimientos previos de los pacientes sobre determinado problema. Esto permite tal como en una

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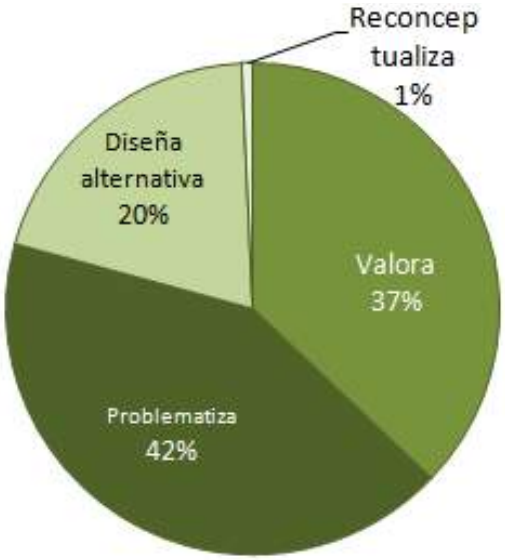
En la Fig. 4 tomamos el fragmento final del folio JB07-2 donde un docente de Pediatría reflexiona sobre la posibilidad que tiene el profesional de la salud de "educar" al paciente. En torno a ese tema explora aspectos que definen al espacio educativo (evaluación, programa, aprendizajes duraderos y profundos, etc.) y analiza la posibilidad de que la relación médico-paciente en el consultorio se configure como tal (no existe un programa, hay mayor autonomía en el paciente que en el alumno, etc.). El docente así aporte una reflexión al "encuentro" médico-paciente en el consultorio y su distancia y cercanía al acto educativo.

Definidas las cuatro acciones reflexivas que identificamos en las producciones escritas, nos propusimos reconocer el grado de presencia de cada una de ellas en los folios. Estas acciones no se presentan de forma excluyente, sino que pueden combinarse en los folios. A continuación presentamos cuántas veces fueron ejercidas estas acciones reflexivas en los 965 folios, representadas a través de porcentajes:

Figura 5
Porcentaje de acciones reflexivas en los folios

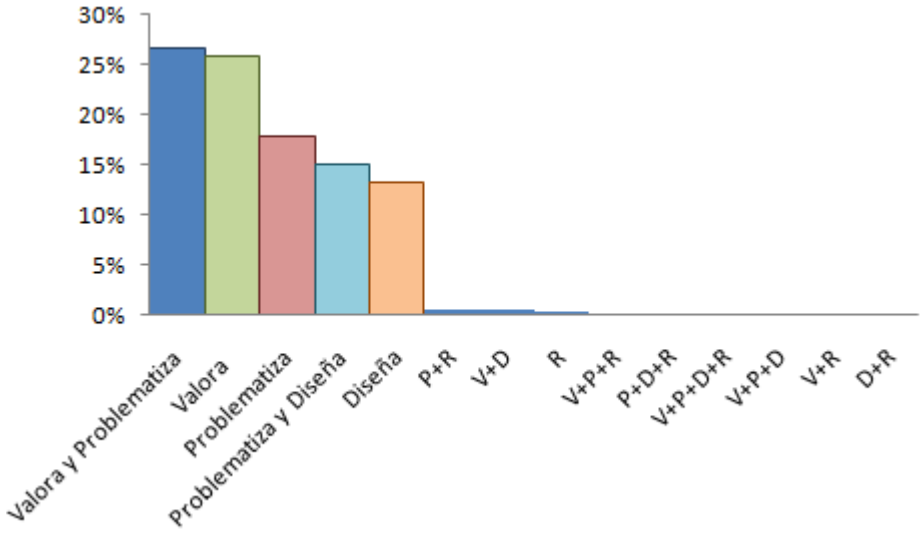


En primer lugar, los docentes *problematizan*, cuestionan o identifican necesidades como resultado de la exploración de algún aporte conceptual o acudiendo a estos para repensar algo que perciben como conflictivo. Esta acción reflexiva comprende el 42% de todas a las acciones reflexivas ejercidas. Seguidamente, en un 37% los profesionales *valoran* positivamente prácticas implementadas y que resultan un caso testigo de aquello que pueden hacer o destacar a raíz de su participación en el Programa. En tercer lugar, en un 20% *diseñan*, es decir materializan en una planificación (de una clase, de un instrumento de evaluación o de un currículum) una práctica que concretarán a futuro, evidencia la potencial transferencia a sus prácticas de lo aprendido la formación. Por último, con la escasa presencia de 1%, los profesionales de la salud *reconceptualizan* los aportes de las ciencias de la educación al interior de sus campos disciplinares. Interpretamos que la empresa intelectual involucrada en esta acción reflexiva se corresponde con la de producción de conocimientos en tanto ponen en diálogo dos campos disciplinares, el de la salud y el de la educación. Este carácter de novedad se acerca más la actividad de un investigador, lo que no es es objetivo del Programa de formación y por ello su presencia resulta reveladora.

Presentamos estas acciones reflexivas tal como aparecen en cada uno de los Folios, así damos cuenta de sus combinaciones:

Figura 6

Porcentaje de acciones reflexivas ejercidas en cada folio



La Fig. 6 muestra que en un 27% de los folios los docentes *valoran y problematizan* una misma práctica, es decir, destacan sus aspectos positivos y conflictivos al mismo tiempo. En un 26% exclusivamente *valoran* con criterios pedagógicos una experiencia educativa realizada. El 18% de sus producciones *problematiza* experiencias docentes habituales desde aportes conceptuales. La *problematización* combinada con *diseño* se presenta en un 15% de los folios. Por último, ante una necesidad detectada *diseñan* una alternativa superadora en un 13%. En suma, mayormente recuperan prácticas recientes y las analizan con los aportes de la formación para mirar fortalezas y oportunidades de mejora, lo que implica también una dimensión propositiva en tanto construyen o infieren criterios para acciones futuras. En un porcentaje menor proponen alternativas concretas encarnadas en el diseño de instrumentos o planificaciones.

4. Discusión y conclusiones

Este trabajo aporta la identificación y conceptualización de cuatro acciones que los docentes de las ciencias de la salud ejercen cuando reflexionan sobre sus prácticas por escrito: *valorar, problematizar, diseñar, y reconceptualizar*. Los estudios antecedentes (Day, 1993, Farrell, 2004; Handal y Lauvas, 1987; Jay y Johnson, 2002; Van Manen, 1977) formulan niveles de reflexión: inicial (o técnico), avanzado (o práctico), y alto (o crítico). Por su parte, Larrivee (2008) adopta cuatro niveles de reflexión: pre-reflexivo (remite a la reflexión en la acción sin conciencia de alternativas disponibles), superficial (proceso descriptivo del accionar centrado en estrategias y métodos sin valoración), pedagógico (basado en concepciones, conocimientos y representaciones de la práctica profesional que busca coherencia entre las teorías personales declaradas y las del hacer concreto), y crítico (toma las concepciones personales y profesionales e implica las condiciones sociales, éticas y políticas de su tarea profesional).

Este trabajo muestra que la totalidad de las escrituras reflexivas del caso estudiado se ubican en los niveles pedagógico y/o crítico (Larrivee, 2008), dado que el Programa propicia un ejercicio reflexivo de la docencia universitaria en el campo de la salud. Con este punto de partida, era necesario reconocer qué implica una reflexión pedagógica y/o crítica por escrito de las tareas docentes. Nuestros resultados puntualizan las cuatro acciones reflexivas mencionadas y contribuyen así a orientar y consolidar la dirección una formación del profesorado universitario con perspectiva académica.

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Enhancing a collective approach to teaching in the spirit of SoTL

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Abstract

Working together in communities that provide an arena for discussing teaching and learning and promote an experience of shared responsibility for educational practices can enhance individual teaching practice (Roxå and Mårtensson, 2015). The presented study explores how such collegial communities can be developed in a multidisciplinary faculty at a university. As a first step, a pilot was conducted with twelve academics participating and working in pairs to explore peer observation of teaching. Peer observation of teaching is a reciprocal process where colleagues observe each other's teaching and provide feedback in order to encourage improvement of teaching practice. The pilot showed that the peer observations enhanced the educational discourse among colleagues and enabled to accentuate teaching as a collective approach (Allern et al., 2017). However, level of feedback and reflection depends upon the participants' engagement in and knowledge about educational research and theory (Tight, 2015). The follow up project was inspired by Shulman (2000) who underlines that scholarship of teaching can evolve when teaching becomes public, peer-reviewed and critiqued. A competition for scholarships for writing and publishing was announced. Additionally, a workshop on peer observation and peer review of teaching was organised to develop pedagogical competence and strengthen academics' work with teaching to make it critical, constructive and research based. Four applicants were awarded writing scholarships. All of them presented their projects at the workshop, where fourteen academics participated. Semi-structured interviews and questioners to participants explore how such projects can make a difference for the individual development as a teacher and for the collective approach to teaching. Participants at the workshop found the competence building important and inspiring. The winners of the writing scholarships worked with publishing at different levels, from "going public" by sharing their systematic work among colleagues at the Faculty to writing an article for a peer review journal. The workshop and the scholarships enabled enhancement of a collective approach to teaching. This paper discuss how peer cooperation can be strengthen through sharing experience and ideas.

1. Introduction

Peer observation of teaching is a reciprocal process between colleagues who observe each other's teaching and have structured conversations with the intentions to increase insight and further development of teaching (Thomas and Thing, 2014). Peer review of teaching takes peer observation one step further by building on the principles of The Scholarship of Teaching and Learning (SoTL) (Shulman, 2011). SoTL means that work on teaching is professionalized through a scientific approach, where theory and research on teaching and learning are central. Furthermore, the importance "going public" allowing peer review and critiques is underlined. This study examines how a collective approach to teaching can strengthen the individual teacher and contribute to enhance teaching quality.

The study started out with a pilot project where reciprocal peer observation was introduced for academics across disciplines in an interdisciplinary faculty at a Norwegian university. The aim was to create a culture for collegial work with teaching, going from teaching as a private enterprise to a collective approach and better teaching practice (Allern et al., 2017). The next step was to encourage and stimulate educational discussions to become more critical, constructive and research-based, developing and strengthening the pedagogical competence of the teachers in the spirit of SoTL, and thereby stimulate more educators to reach a meriting status. Both projects were led by the Vice Dean of Education at the faculty and anchored in the faculty's strategy (2014-2017), where peer observation of teaching was highlighted as an important means to strengthen teaching and students learning.

In the pilot project, twelve teachers worked together in pairs with peer observation of teaching. Collaborating across disciplines opened up to academic, inspirational discussions in a collegial community with focus on teaching (Allern et al., 2017). The level of feedback and reflection depends on the participants' involvement and knowledge about research and theory in teaching and pedagogy (Tight, 2015). When teachers work together to create an arena for discussion of teaching and learning, their teaching can be strengthened, resulting in a sense of a shared responsibility for teaching and educational practice (Roxå and Mårtensson, 2015).

In order to stimulate to systematic work on teaching and making it subject to peer review and criticism in the spirit of SoTL, a competition for writing scholarships was announced to make inquiries in your own teaching and publish the results. In addition, a joint workshop was organized with peer observation and peer review of teaching as a topic. The principles for SoTL were presented, and theory and research on teaching was discussed. The scholarship winners presented their work at the workshop. In order to explore how participation in such projects has an impact on both the individual's development as a teacher and the local teaching culture, semi-structured interviews were carried out with the scholarship winners. In addition, all the participants at the workshop were invited to participate in an anonymous online survey.

2. Methodology and research design

2.1. Writing scholarships

A competition for five writing scholarships (~1000 EUR each) was announced to all faculty members via e-mail autumn 2017. Grants were awarded candidates that: 1) Were aiming to be appointed a merited teacher at the university; 2) were using Peer Observation or Peer Review of Teaching to support the development of teaching skills and quality; 3) Would like to present their work at the workshop. Applications were evaluated by the Vice Dean of Education at the Faculty together with the project team and department heads. Allocated funds were transferred to the employee's work account to support professional activity.

2.2. Workshop

An invitation was sent out to academic staff at the faculty to participate in a two-day workshop. As part of the program, the winners of the writing grants presented their projects and Dr. Torgny Roxå from Lund University Faculty of Engineering in Sweden gave a key-note lecture. All together fourteen teachers participated at the workshop.

2.3. Empirical material

Data material was collected during an anonymous online survey (November 2018 - January 2019) and semi-structured interviews (December 2018 and January 2019).

All workshop participants were invited to respond to the online survey. The purpose of the survey was to investigate how participation in projects like this affect the individual development of the teachers and the collegial community locally in a multidisciplinary faculty like ours. The questions that were asked related to their work with teaching portfolios, peer observation of teaching, peer review of teaching, and outputs from the workshop.

All four scholarship winners were interviewed. Interviews were conducted face to face, lasting ~60 minutes, and focused on the following questions:

- How do you define the terms Peer Observation of Teaching and Peer Review of Teaching?
- You were one of four applicants who received a grant, what was your motivation to apply?
- Can you tell us about your project, what was the main objective of the project?
- What were the main outputs resulting from the writing scholarship?
- Did the scholarship and your participation in the workshop give any "spin-offs" in your research group?
- Have you published the results from your project in other forums after the workshop?
- Are writing scholarships a good measure to strengthen and develop our teachers?
- What output did you get from the workshop?
- What types of measures do you think are important to strengthen you as a teacher?

The interviews were transcribed and analysed by alternating between reading the written transcripts, categorizing them and reading relevant literature in an iterative process to allow issues and experiences be identified and categorized.

3. Results and discussion

The aim of this project was to raise awareness and inspire teachers to work more systematically and critically with their own teaching by promoting understanding and a culture for peer guidance, peer review and peer review. We wanted the participants in the project to have the opportunity and time to present experiences and results from their own work with teaching both in writing and orally. The writing scholarship and workshop together focused on the work of peer observation and peer review of teaching, and the ability to communicate their expertise in a professional setting. The aim was also that the writing scholarships should result in a publication (lecture, abstract, article). This constitutes an important step in the path of the individual employee's work to develop as educators and to develop their teaching portfolio for application for merit status.

3.1. Workshop

Eleven of the participants responded to the survey. The teachers found it inspiring to participate in the workshop. Five of the participants had developed a teaching portfolio,

while two were currently working on this. Six felt that the participation in the workshop inspired them to develop their own teaching portfolio. Three of the participants at the workshop also participated in the pilot project on peer observation of teaching at the faculty. Participants reflect differently on the term peer observation:

> "In this term, I (at) one co-operate with a colleague to get each other to reflect on our own teaching through an open dialogue (with certain agreed frameworks) about each other's way of teaching."
>
> "Peer observation of teaching is an instrument to move teaching away from being a private enterprise, through the collaboration between colleagues observing each other teaching, giving feedback and thus allow for reflection and change."
>
> "That a colleague follows my teaching and gives feedback."

Some of the participants use peer observation of teaching themselves to improve their teaching:

> "I use it to make changes to my own teaching, both lectures and seminars / colloquia to improve the quality of teaching and improve the students' learning."

The participants also have different thoughts around the term peer review of teaching:

> "Evaluate a colleagues teaching based on what is considered good teaching according to pedagogical theory and own teaching practice."
>
> "Evaluation by a skilled colleague."
>
> "Evaluation of material for publication."

At the same time, some pointed out that the term was difficult to understand:

> "For me this is a somewhat unclear concept and not so easy to distinguish from peer observation of teaching. This term is after all derived from the work related to scientific publication and a prerequisite is that the assessment is made anonymously in order to be able to provide an objective assessment of content. This seems difficult to implement in practical teaching, but can of course be used in publishing pedagogical studies."

When asked about what they considered to be the most important "output" from the participation in the workshop, participants answered that they received many good inputs and ideas for improving their own teaching. The feeling of community, and the importance and potential of collaborating and working systematically with development and quality assurance of teaching was highlighted.

This project is a "top-down" managed project embedded in the faculty's strategy. One of the participants was disappointed with the "lack of follow-up and concrete actions" in relation to following up on the pilot on peer observation of teaching and wanted more initiatives like this.

Participation in the workshop led to changes in the teaching of some of the participants through increased reflection and awareness of their own teaching practice. The workshop

also laid the foundation for more systematic feedback from colleagues and students and thus contributed to adjustments in the teaching. Others report that they had not made significant changes but had become "*more open to co-operation round and in education*". One of the participants had called for "speed dating" to find a colleague to work with in the colleague guidance. Another writes that "*I found the workshop inspirational, it gave room for exchange of experience on teaching but did not comprise as a practical development tool*".

Writing scholarships

The four scholarship winners came from different disciplines and thus taught very different subjects and student groups. The interviews showed that all the scholarship winners worked on publishing, although at different levels from "going public" through sharing systematic work with teaching with colleagues at the faculty to writing an article for a peer review journal.

Motivations for working towards a publication differed. One of the scholars talked about "*playing each other good*", and in order to do this one has to share. In that way, teaching becomes a collective project: "*In peer review, one is not only looking to be critical but critically constructive in their feedback. That is perhaps the core. *". One of the winners pointed out that this work had started in connection with teaching a new and somewhat unknown subject. This led to seeking help and advice from a colleague in another field at another faculty, and together they developed a new and innovative teaching program using methods from different disciplines to provide increased learning among the students.

Another had participated in the pilot on peer observation, and wanted to take this one step further by developing towards more peer review work - because it would give them an "*opportunity to sit down and reflect on the work we have done […]*".

One of the scholars considered publishing internally at the university, reflecting on own academic limitations related to theory and research on teaching and learning: "*I have been a bit uncomfortable about the way we talk about publishing, as if I should be a researcher in the field of pedagogy, and I am not. I know my own research area, but doing research on my own teaching… I can reflect - but I cannot do research on it. I can have kind of a scientific approach to learning through errors and feedback and such … […] Publishing is also presenting orally, and discussing with colleagues is also part of bringing it out in a way*".

One used the scholarship to write an abstract: "*a little summary that I assume has become - yes it is at least public, it is available online I think […] My task was to present my experience with peer observation of teaching, how it could affect my teaching*".

The importance of the project and the workshop was highlighted by several of the respondents: "*It was very useful, especially the input from a good professional (Torgny)*".

One participant emphasized the importance of working towards a publication: "*That we as teachers also should contribute to communicate what we are doing. I think that is very important.. [- -] I think it can also help to give it (teaching) more weight *".

One underlines the importance of the project on the basis of peer observation: "*That yes, at the bottom, it is to work with the quality of education and with a focus on the students their learning. But an important part of that work is related to working systematically and scientifically, use scientific work method, and as part of it, sharing [...] Peer observation is …. a way to de-privatize the teaching situation. It is important to open up things that have been private and closed. For me, peer observation is a bit like that perhaps, because it has a focus on performance. When letting a*

colleague into the classroom … it is easy to focus on exactly what happens there ..in that hour […] I like the attempt to change focus and talk about peer review, it expands, for me it is an extension. That you include the preparation and the entire teaching design question. It is very much more than what is done during that hour of teaching."

4. Conclusion

The main objective of the study has been to explore whether organized projects on peer observation of teaching, writing scholarships and workshops can promote a stronger focus on teaching at the faculty and help strengthen local teaching cultures. The study has shown that strengthening of peer communities around teaching can be one way to enhance quality of teaching and help academics qualify to become merited teachers. Two of the participants in the project applied for merited status in 2018, the leader of the project applied 2019. Anchoring the projects in the strategy and the leadership has been important for the implementation of this project. The faculty takes its ambitions further in its new strategy up to 2022 and, as the goal, aims to have 80% of the teachers documenting teaching portfolios by the end of the period. Furthermore, the Faculty works actively for the establishment of a Center for Excellent Education.

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La formación del profesorado para la sostenibilidad y multidisciplinaridad en proyectos de Educación Superior

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Resumen

El desarrollo sostenible, de marcado carácter multidisciplinar, reflejado en los objetivos de la Agenda 2030 de la ONU [1], es una responsabilidad social compartida. Dicha responsabilidad se aborda desde las Instituciones con planes estratégicos y de interacción social. La Universidad, desde su actividad integradora y formativa, puede y debe jugar un papel fundamental como motor de cambio en la sensibilización y conducta de la sociedad. El profesorado universitario, en su desarrollo profesional y como orientador del proceso enseñanza-aprendizaje, necesita formación y recursos para liderar este cambio.

Por ello, en este trabajo se presenta una experiencia llevada a cabo en la Universidad del País Vasco (UPV/EHU) dirigida a la formación de profesorado, con el fin de favorecer un cambio en la propuesta y realización de proyectos para el alumnado de educación superior. El objetivo es que dichos proyectos, sean de carácter multidisciplinar, realizados con metodologías activas y centrados en la actividad profesional y en el desarrollo sostenible.

La experiencia se realizó con profesorado de once áreas de muy diferente cuerpo de conocimiento: Ingeniería, Arquitectura, Historia del Arte, Sociología, Mineralogía y Petrología, Filología, Química, Economía, Farmacia y Psicología Evolutiva. La formación se impartió de forma presencial y no presencial durante tres semanas con una duración de 1 crédito ECTS.

Se formaron equipos de entre tres y cinco personas de diferentes áreas de conocimiento, a los que se propusieron tres escenarios, de problemas reales y profesionales, para desarrollar diferentes proyectos. Dichos escenarios incluían un reto/problema para resolver desde los conocimientos de cada área y de los objetivos del desarrollo sostenible.

La metodología utilizada en la formación fue de Aprendizaje Basado en Problemas (ABP). Cada miembro del equipo estableció un hilo conductor de situaciones/subproblemas relacionados con su área de conocimiento que, presentados al alumnado, conducirán a la resolución del reto propuesto. Se contó con el apoyo de un aula virtual, que permitió la interacción entre todos los participantes y el equipo formador.

Como resultado final, se obtuvieron propuestas de proyectos multidisciplinares, para desarrollar por alumnado de Grados diferentes con el punto de mira en la sostenibilidad.

La evaluación de los proyectos se realizó por pares y por el equipo formador, mediante listas de control.

Los participantes en el curso lo calificaron con un 6/6.

Abstract

Sustainable development, of a marked multidisciplinary nature, reflected in the goals of the UN 2030 Agenda [1], is not an exclusive issue of the Governments and Institutions, but is a shared responsibility of the whole society. The Institutions lead this responsibility, through strategic plans to produce a social interaction. The University, from its integrative, formative and multidisciplinary activity, can and should play a fundamental role as an engine of change in the awareness and behaviour of society. University Teachers, in their role in teaching-learning process and in their professional development, need training and resources to lead this change.

Therefore, this paper presents an experience carried out at University of the Basque Country (UPV/EHU), aimed at teacher training in order to favor a change in the proposal and implementation of projects for higher education students. The objective for these projects is to be multidisciplinary, carried out with active methodologies and focused on professional activity and sustainable development.

In the experience, teachers from eleven areas of very different knowledge subjects participated, including Engineering, Architecture, History of Art, Sociology, Mineralogy and Petrology, Philology, Chemistry, Economics, Pharmacy and Evolutionary Psychology. The training was given both into and out of the classroom for three weeks (1 ECTS credit).

Work teams composed between three and five people from different areas of knowledge were formed, to which, three scenarios were proposed, including real and professional problems to develop different projects. These scenarios included a challenge / problem, to be solved from the knowledge of each area and sustainability.

The methodology used in the training was Problem Based Learning (PBL). Each team member established a thread of situations / subproblems related to their area of knowledge, which allowed reaching the resolution of the proposed challenge. A virtual classroom served as a supporting platform for the interaction between all the participants and the training team.

As a final result, proposals for multidisciplinary projects were obtained, which are intended to be developed by students from different Degrees with the focus on sustainability.

The evaluation of the projects was carried out both by the peers and by the training team, following a checklist.by means of a checklist. Participants gave a 6/6 score to the course.

1. Introduccion

El desarrollo sostenible, de marcado carácter multidisciplinar [2, 3], está de plena actualidad. Sin embargo, se desconoce la profundidad del significado y la amplia aplicabilidad del término, por lo que es difícil que se produzca una sensibilización y el consiguiente cambio en el comportamiento y conducta de la sociedad en general.

Uno de los pilares de la sociedad es la Universidad, lugar de formación integral de futuros profesionales. La estructuración de los planes de estudios de los Grados y la poca flexibilidad de los mismos en la Universidad española, hace casi imposible incluir materias completas con competencias específicas sobre desarrollo sostenible [4]. Los Proyectos y Trabajos Fin de Grado, parte de esos planes de estudio, suelen estar restringidos, en la mayoría de los Grados, al tratamiento de temas específicos de áreas de conocimiento concretas, sin tener en cuenta aspectos de sostenibilidad y multidisciplinaridad, que es lo más demandado actualmente en las salidas profesionales.

Debido al carácter multidisciplinar del desarrollo sostenible, sería interesante e incluso más adecuado, incluir algunos de estos aspectos en el contexto propio de las asignaturas, constituyendo parte del cuerpo de conocimiento de las mismas [5, 6]. Esto, ayudaría a conseguir la adquisición de competencias de sostenibilidad de forma multidisciplinar dentro del propio Grado. Si estos Proyectos y Trabajos Fin de Grado se planteasen abiertos a múltiples áreas de conocimiento, podrían ampliar el citado carácter multidisciplinar y las competencias de sostenibilidad.

Por otra parte, las metodologías activas en el proceso enseñanza-aprendizaje de la educación superior, han demostrado ser idóneas para el desarrollo de competencias y, en especial, aquellas que requieren trabajo multidisciplinar [7-10].

Por todo ello, se planteó este Curso de Formación con el fin de concienciar y formar al profesorado para trabajar en equipos multidisciplinares con metodologías activas y con el punto de mira en el desarrollo sostenible [11, 12]. Dicha formación, sobre la que hay poca literatura científica [13, 14], es un importante punto de partida para plantear al alumnado Pro-

yectos Multidisciplinares Sostenibles basados en salidas profesionales. El curso se ofreció de forma abierta a todo el profesorado de la UPV/EHU para asegurar participantes de muy diferentes áreas de conocimiento.

2. Desarrollo del curso

La propuesta del curso se realizó a través del Servicio de Asesoramiento Educativo (SAE/HELAZ de la UPV/EHU) [15], con una duración de un crédito ECTS (10 horas presenciales y 15 no presenciales) para el profesorado de la UPV/EHU con el siguiente contenido, competencias y organización temporal:

2.1. Contenido

— Visión general de la metodología.
— Planteamiento de un problema de carácter multidisciplinar relacionado con el desarrollo sostenible, tema central de un Proyecto/TFG.
— Diseño de actividades con tareas (subproblemas).
— Integración de subproblemas en el problema central.
— Elaboración de rúbricas de evaluación.
— Coordinación en la valoración y evaluación por pares, mediante listas de control.

Tabla 1
Competencias, actividades y distribución temporal

Competencias	Actividades	Tiempo
Conocer las pautas de la metodología		**1h P**
Diseñar escenarios de problemas / situaciones reales	Determinar las competencias específicas y de sostenibilidad para cada subproblema y un posible escenario que permita trabajarlas.	2,5 h P 2,5 h NP
Preparar actividades con tareas	Elaborar una actividad con una/s tarea/s asociadas a las competencias y escenario planteado en el subproblema.	2,5 h P 2,5 h NP
Integrar y relacionar dichas actividades en el problema central	Determinar el hilo conductor y la relación entre los subproblemas de cada área de conocimiento en el problema central y establecer un cronograma para la ejecución del Proyecto/TFG	4 h P 5 h NP
Plantear el Proyecto/ TFG	Elaborar un esquema/resumen del Proyecto/TFG que permita el desarrollo completo del mismo por el alumnado	3,5 h NP
Evaluar el resultado final	Evaluación compartida y evaluación por pares	1,5 h NP

P: Presencial. NP: No presencial.

El desarrollo del curso se llevó a cabo, además, con el apoyo de un aula virtual que permitió la interacción de todos los participantes.

2.2. Dinámica de trabajo

Después de una primera sesión en la que se explicaron los objetivos del curso, los participantes formaron grupos de entre tres y cinco personas pertenecientes a áreas de conocimiento diferentes. Cada grupo asignó a cada uno de sus componentes un "rol", de acuerdo con los que se establecen habitualmente en un trabajo grupal mediante una metodología ABP: Director del Proyecto/TFG, Portavoz, Secretario y Crítico/Controlador. Debido a que el citado Proyecto/TFG se propone para un determinado Grado/Titulación, a una de las áreas de conocimiento se le adjudicó un mayor peso específico, por lo que se constituyó como la principal o dominante del Proyecto/TFG y, por tanto, el componente del grupo que ejerció de Director, fue el/la profesor/a perteneciente a dicha área.

La formación de los grupos y la propuesta de los escenarios con los problemas centrales para su desarrollo como Proyectos/TFG, aparecen reflejados en la Tabla 2.

Tabla 2
Grupos, áreas de conocimiento y propuestas de escenarios de los problemas centrales

Grupo	Áreas de conocimiento	Escenario propuesto
Grupo 1	Arquitectura Historia del Arte Sociología	"El mercado, lugar de referencia para la cultura, identidad y formación de un pueblo"
Grupo 2	Proyectos de Ingeniería Mineralogía y Petrología Filología Inglesa Química Analítica.	"Diversificación de cultivos para Álava más sostenible"
Grupo 3	Economía Financiera Filología Inglesa. Gestión y Legislación Historia del Arte	"La empresa *Nutripack* (suplementos alimenticios y empaquetado sostenible) se enfrenta a un nuevo proyecto"

A la vista de estas propuestas, cada equipo propuso un hilo conductor entre las áreas de conocimiento, para desarrollar y resolver el Proyecto/TFG y cada miembro del equipo elaboró el escenario/subproblema correspondiente a su especialidad. Dicho subproblema, incluía competencias, actividades y tareas, resultados de aprendizaje y rúbricas de evaluación.

El debate y puesta en común de todo el trabajo individual se integró y consensuó por todos los miembros del equipo, obteniéndose un documento definitivo con todo el material elaborado.

El resultado final fue evaluado, mediante una lista de control, por el profesorado que impartió el curso y por pares entre los grupos participantes.

3. Resultados

Dada la extensión requerida para este artículo, se presenta a continuación, de forma resumida, una parte del material elaborado por cada grupo, en el que se detallan los escenarios principales, identidad y procedencia de los miembros de cada grupo, el hilo conductor plan-

teado para cada propuesta de Proyecto/TFG y el área de conocimiento dominante en cada uno de ellos.

3.1. Grupo 1

Propuesta de Proyecto/TFG: El mercado, lugar de referencia para la cultura, identidad y formación de un pueblo.

Áreas de conocimiento participantes: Arquitectura, Historia del Arte y de la Música y Sociología y Trabajo Social.

Escenario principal

El mercado de la Ribera de Bilbao quiere acercar y compartir con el ciudadano la historia del edificio, su valor arquitectónico y artístico, así como hacer que sus instalaciones cumplan, de forma óptima, con los objetivos de un estilo de vida (alimentación) sostenible.

Para ello, el equipo seleccionado, compuesto por especialistas de distintas áreas, se plantea distintos objetivos.

Hilo conductor

- Estudiar la posible instalación de una compactadora de residuos orgánicos y otra de residuos de cartón (Arquitectura).
- Difundir el valor arquitectónico y artístico del edificio (Arquitectura e Historia del Arte).
- Diseñar Talleres y/o Actividades educativas sobre la responsabilidad compartida en Alimentación Sostenible (Sociología y Trabajo Social).

Área de conocimiento dominante: Arquitectura.

3.2. Grupo 2

Propuesta de Proyecto/TFG: Diversificación de cultivos para Álava más sostenible

Áreas de conocimiento participantes: Filología Inglesa, Alemana, Traducción e Interpretación, Química Analítica, Expresión Gráfica y Proyectos de Ingeniería y Mineralogía y Petrología.

Escenario principal

La Diputación de Álava y la Unión Agroganadera de Álava (UAGA), dentro del Plan General de Ordenación Urbana de la Cuadrilla de Añana, se plantean un estudio ambiental, que pretende recalificar la zona más próxima al núcleo urbano de Zambrana. Esta zona está ubicada en suelo no urbanizable y la intención es diversificar la producción agrícola de la zona y hacerla más sostenible.

El objetivo será cultivar lúpulo y cebada para abastecer a productores de cerveza locales interesados en hacer un "producto de kilómetro cero". El presente proyecto se presentará a la convocatoria 2019 de la European Agricultural Guarantee Fund (EAGF) de la Unión Europea para solicitar la subvención necesaria.

Hilo conductor

— Elaborar un proyecto competitivo para solicitar una subvención a la convocatoria 2019 de la European Agricultural Guarantee Fund (EAGF) (Filología Inglesa y Evaluación de Proyectos).
— Realizar un estudio hidrogeológico y geotécnico de la zona (Mineralogía).
— Analizar químicamente la calidad de suelos (Química Analítica).
— Diseñar un sistema de riego sostenible (Proyectos de Ingeniería).

Áreas de conocimiento dominantes: Filología inglesa, Mineralogía, Química e Ingeniería.

3.3. Grupo 3

Propuesta de Proyecto/TFG: La empresa NUTRIPACK (suplementos alimenticios y empaquetado sostenible) se enfrenta a un nuevo proyecto.

Áreas de conocimiento participantes: Economía Financiera II, Filología Inglesa, Alemana, Traducción e Interpretación, Historia del Arte y Música, Gestión y Legislación.

Escenario principal

Diseñar una campaña publicitaria para que una cooperativa local distribuya y comercialice sus productos de agricultura ecológica para el consumo por un público de perfil generalista o interesado en el consumo sostenible y responsable. El producto se distribuirá a nivel local, nacional e internacional. El presupuesto para el diseño de la campaña es de 20.000 euros.

Hilo conductor

— Analizar la estadística para definir el target y los costes para elaborar el presupuesto real y factible de la campaña (Economía Financiera).
— Ofrecer a los clientes una imagen de marca que muestre principios éticos y sostenibles, así como de innovación basada en la tradición, elaborando un catálogo visual y conceptual que represente estas ideas (Historia del Arte y Música y Filología Inglesa, Alemana, Traducción e Interpretación).
— Cuidar la terminología y la propiedad intelectual de las imágenes que has seleccionado para la preparación del catálogo (Legislación y normativa vigente).

Área de conocimiento dominante: Economía Financiera.

4. Conclusiones

El curso impartido se valoró mediante un cuestionario elaborado por el SAE/HELAZ, que incluye 10 ítems cuya puntuación es de 0 a 6. La respuesta al cuestionario se hizo online y de forma anónima. Los ítems del cuestionario se pueden agrupar en los siguientes bloques/aspectos del curso:

1. Formalidad y estructura del curso.
2. Trabajo desarrollado por los formadores.
3. Actitud y satisfacción de los participantes.

4. Resultados de aprendizaje obtenidos y respuesta a las expectativas y necesidades profesionales de los participantes.

Los valores obtenidos en todos los ítems fueron entre 5 y 6, resultando una valoración global de 6. A la vista de la puntuación obtenida, se puede concluir que el curso de formación resultó satisfactorio e interesante para el profesorado participante. La interacción y comunicación verbal con los participantes reflejó, además, su disposición a poner en práctica el trabajo realizado e incluir el desarrollo sostenible como una competencia transversal reflejada en los futuros Proyectos/TFGs planteados para el alumnado.

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Learning Assistants as Key Partners in the Scholarship of Teaching and Learning

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Abstract

Fifteen years ago, the Norwegian University of Science and Technology (NTNU) implemented the LAOS project with a vision of employing students as a "qualified pedagogical resource [...] with a strong involvement in the departments' academic work" (Tjeldvoll, 2005, p. 3; my translation). This vision built upon a community-of-practice perspective (Wenger, 2011), where learning assistants and academic staff would engage in the shared interest of enhancing the quality of student learning.

The starting point for this paper are recent evaluations of LAOS that show that neither learning assistants nor academic staff have been able to form pedagogical teams within the academic departments. One way of involving students in the departments' work could be to include them as partners in the Scholarship of Teaching and Learning (SoTL). A review of current research, however, revealed several issues that need to be addressed. First, both the time span and nature of the learning assistants' employment argue against a community-of-practice perspective on LAOS. Second, conducting SoTL research in partnership with learning assistants challenges conventional understandings of roles and identities. Academic staff need to develop a new professional role as *teachers*, whereas the learning assistants need to establish their *expertise* as students and learners. On the other hand, including learning assistants as key partners in SoTL could lead to significant benefits for both learning assistants and academic staff. Not only would they get valuable access to each other's perspective and experiences, they would also grow as learners within a greater academic community.

The paper concludes with a reflection on how the LAOS project could contribute to transforming existing structures so that student-staff partnerships "become part of the culture and ethos of the institution" (Healey, Flint, & Harrington, 2014, p. 26). Steps that need to be taken are to make both learning assistants and academic staff aware of conventional role assumptions and to help them understand the potential that lies in realizing the LAOS vision.

1. Introduction

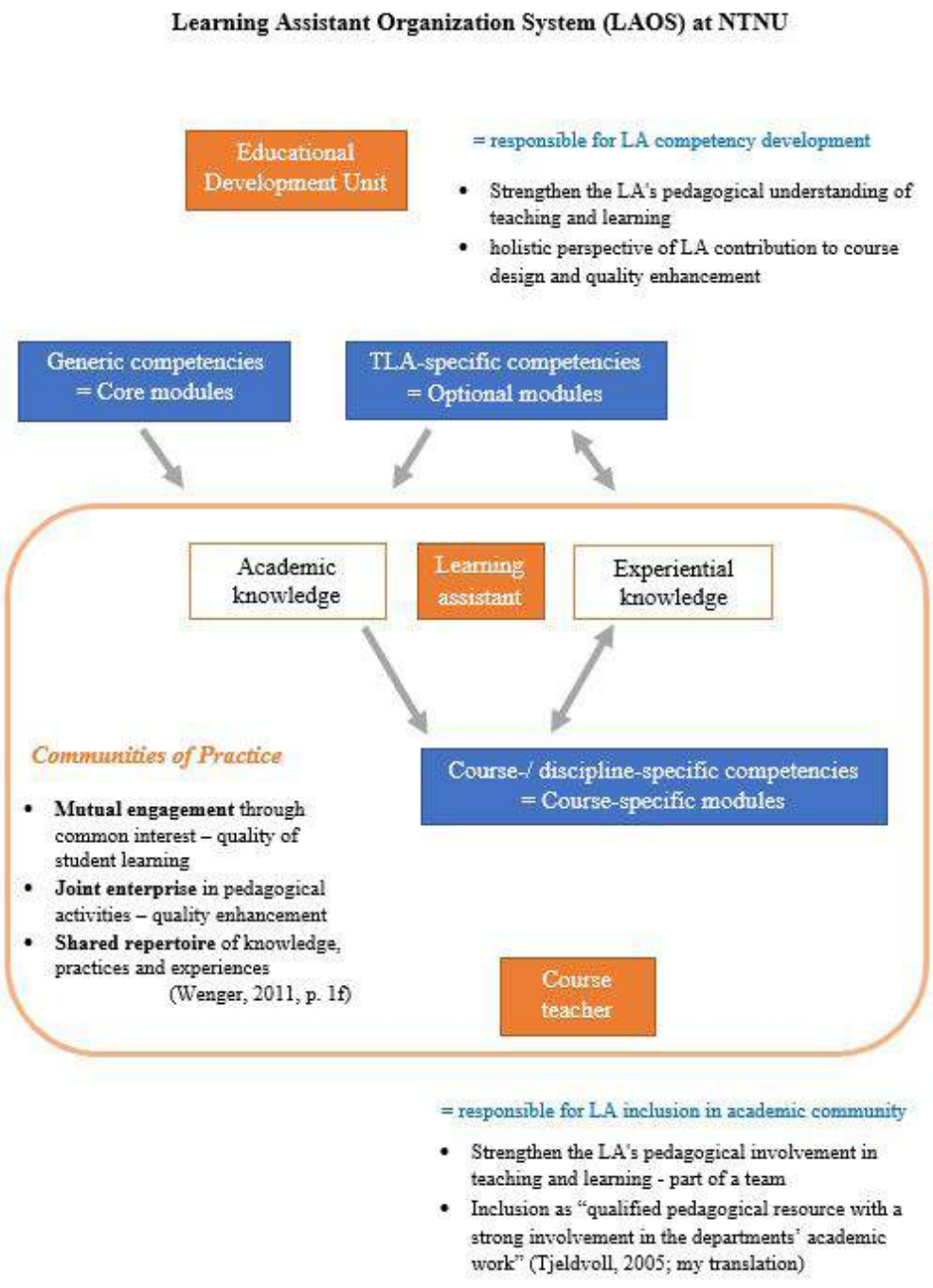
This year, fifteen years have passed since the Norwegian University of Science and Technology (NTNU) first started to employ students as learning assistants. Today, over 700 students work part-time besides their own studies with facilitating younger students' learning through mentoring, giving feedback and formative assessment of student assignments.

The original vision of the LAOS project was to create a new role in learning assistants as a "qualified pedagogical resource [...] with a strong involvement in the departments' academic work" (Tjeldvoll, 2005, p. 3; my translation). Over the past decade, engaging students in teaching and learning has become one of the most radical and transformative challenges in higher education (Cook-Sather, Bovill, & Felten, 2014; Healey *et al.*, 2014; Tong, Standen, & Sotiriou, 2018). One way to involve learning assistants in the departments' academic work could be to include them as key partners in the Scholarship of Teaching and Learning (SoTL). Auten and Twigg (2015) define SoTL as "a partnership of inquiry […] in

which teacher and students investigate how a classroom operates, situating not just teachers but also students to study their own learning in context" (p. 8f).

During their first term of employment, learning assistants are required to complete an institution-wide training program offered by the institution's Educational Development Unit in collaboration with the academic departments that the learning assistants work for (figure 1).

Figure 1
Pedagogical illustration of LAOS



Through core modules that are common for all learning assistants, the central Educational Development Unit aims to increase the learning assistants' pedagogical *academic knowledge* which is independent of the discipline or context that the learning comes from. Academic knowledge would include general pedagogical principles such as how to give constructive feedback, how to facilitate student learning or how to establish a supportive learning environment. More importantly, however, the academic departments are responsible for offering course-specific modules that aim at relating the learning assistants' academic knowledge to their *experiential knowledge.* Experiential knowledge is knowledge that the learning assistants gain in their work as learning assistants within a course-specific academic context. Experiential knowledge could include insights into how students understand medical terminology, how to facilitate the writing of chemistry lab reports or how to provide feedback in online sociology classes.

Unfortunately, results from anonymous evaluation surveys since 2015 show that even though the follow-up provided by the academic departments has increased the learning assistants' awareness of course-specific pedagogical challenges, less than half feel that they have become part of a pedagogical team. They also report that the majority of course teachers do not interact with the learning assistants themselves but delegate the course-specific follow-up to temporary staff such as PhD-candidates or to other course teachers.

In this paper, I would like to investigate why an institution-wide pedagogical program such as LAOS has not been able to better support the inclusion of learning assistants in the academic work at the institution. First, I will examine whether C*ommunities of Practice* is an appropriate perspective on the relationship between the learning assistants and academic staff in the LAOS context. Second, after providing a short theoretical introduction to the Scholarship of Teaching and Learning (SoTL), I will discuss possible challenges and benefits with including learning assistants as key partners in SoTL. Last, I will reflect on steps that need to be taken in the LAOS project to finally realize its original vision.

2. Method

Even though this paper takes as its starting point the results from previous LAOS evaluation surveys, this is not an empirical study. Instead, the discussion and reflection presented in this paper are based on research articles that were identified in literature searches with search terms such as *students, student-staff, learning assistants, teaching assistants, TA training, partner, community, partnership, engagement, SoTL* and any combination thereof. These articles were then coded through open and selective coding which are often used in educational and social science research. Open coding served to identify key concepts and a need for more targeted literature searches. In the selective coding, relevant articles were coded for the key concepts identified in the open coding process, such as *identity, role or partnership.* All coding was done manually using NVivo.

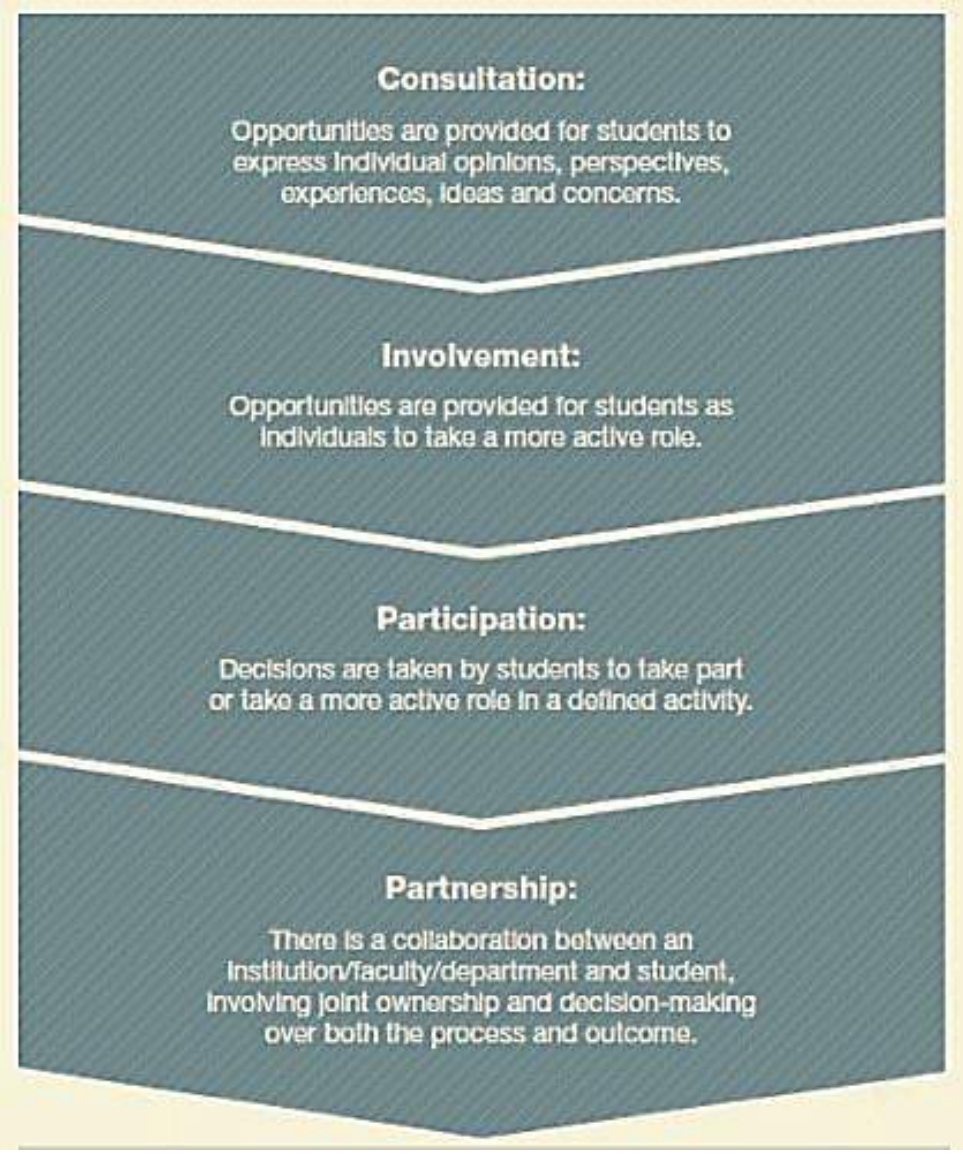
3. A Communities-of-practice perspective on LAOS?

One of the broader objectives of LAOS has been the development of pedagogical *Communities of Practice* (CoP) between the learning assistants and course teachers. "Communities of Practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2011, p. 1). *Shared interest* in providing the best educational quality for student learning,

mutual engagement in each other's work and a *shared repertoire* of pedagogical practices and experiences are important pillars that the learning assistant training program seeks to facilitate.

However, a closer look at the characteristics of CoP reveals that both the time aspect as well as the process of becoming a member argue against a CoP perspective on the LAOS program. Communities of Practice develop over time as new members "gradually approach a status of full membership by both 'absorbing and being absorbed' in the culture of praxis" (Lave & Wenger, 1991, p. 95). Learning assistants at NTNU, however, are hired for only one term at a time and therefore do not have the time to grow from apprentices to full members. Neither are they meant to 'be absorbed' into their department, but to contribute as equal partners with their experiential knowledge.

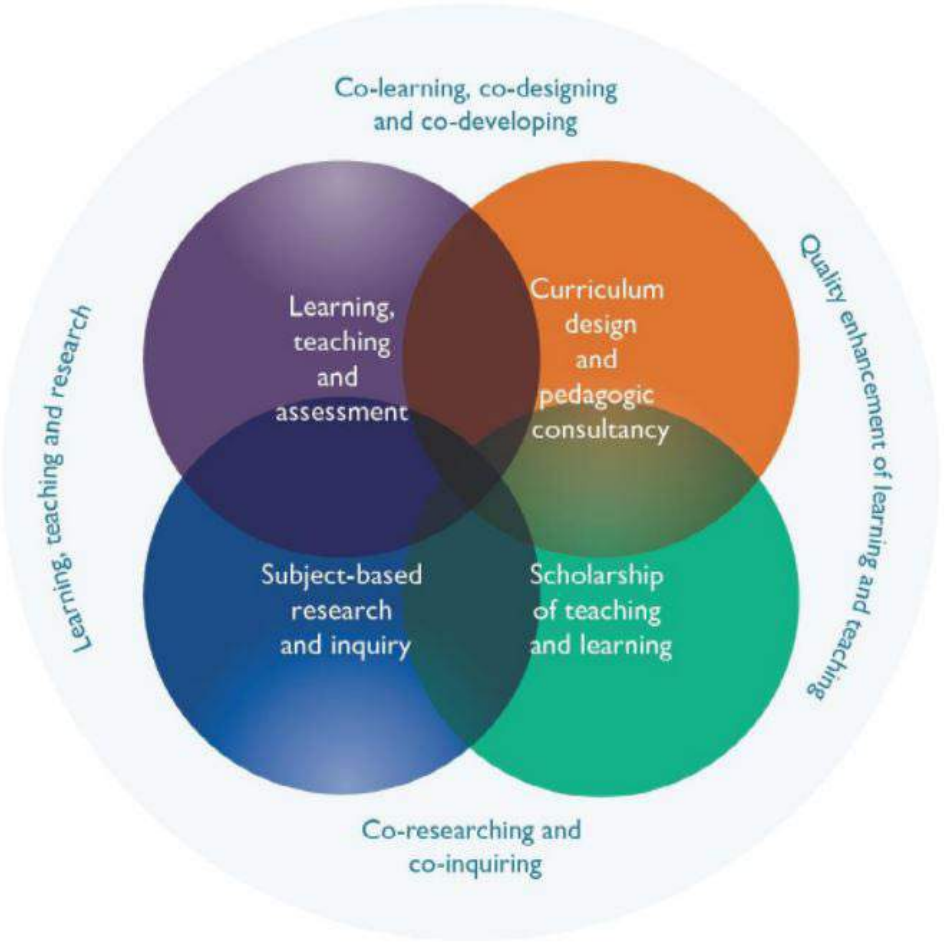
Figure 2
Four stages of student engagement (after HEA and NUS 2011)



Healey *et al.*, 2014, p. 16.

A more suitable perspective in the context of LAOS would be that of *student-staff-partnerships (SSP)*. Healey *et al.* (2014) define partnerships as "a process of student engagement, understood as staff and students learning and working together to foster engaged student learning and engaging learning and teaching enhancement" (p. 7). Cook-Sather *et al.* (2014) are even more specific and describe it as "a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis" (p. 6f). Figure 2 by Healey *et al.* (2014, p. 15) illustrates the four stages of student engagement, where partnership is on the most complex and highest desirable level.

Figure 3
Ways of engaging students as partners in higher education



Healey *et al.*, 2014, p. 24.

Healey *et al.* (2014) not only differentiate between these four levels of student engagement, but also what student engagement aims at. They state that "whereas most students in a programme may be engaged in learning and research, it is very rare that most students in a programme are engaged as partners in the enhancement of learning and teaching practice and policy, beyond giving their opinions or evaluations" (p. 23). This is

true for learning assistants at NTNU, whose tasks usually are limited to facilitating exercises, leading tutorials or giving feedback on student assignments. Furthermore, a recent analysis of quality policy procedures at NTNU showed that learning assistants still are perceived only as a *measure* instead of *agents* in educational quality work (Hakel, 2017). One way to change this situation would be to include learning assistants more actively in the Scholarship of Teaching and Learning, where they would not only be "engaged in learning, teaching and research, but are beginning to negotiate the form that these engagements take, and some may be involved as co-designers of the activities and co-evaluators of the experiences" (Healey *et al.*, 2014, p. 24). Figure 3 below illustrates this approach.

4. The scholarship of teaching and learning (SoTL)

Changing one's teaching does not necessarily lead to better student learning. Teaching and learning are processes that "must be understood and investigated together" (Chick, 2010c). The Scholarship of Teaching and Learning (SoTL) is an inquiry approach that helps to "bring a scholarly lens […] to what happens in the classroom" (Chick, 2010b).

Even though research in SoTL is not confined to one single method with regard to the research question, the data collection or analysis, the following steps listed by Chick (2010b) seem to be common for all SoTL research:

SoTL involves:

- asking meaningful questions about student learning and about the teaching activities designed to facilitate student learning,
- answering those questions by first making relevant student learning visible as evidence of thinking and learning (or mis-learning), and then systematically analyzing this evidence, and
- sharing the results of that analysis publicly to invite review and to contribute to the body of knowledge on student learning in a variety of contexts, and
- aiming to improve student learning by strengthening the practice of teaching (one's own *and* others').

Regarding the LAOS program at NTNU, the freedom to choose the method that seems most appropriate within one's own academic context means that there is a rich array of possibilities for learning assistants to engage in both research design, data collection, analysis and implementation. By participating in SoTL research, learning assistants can not only contribute to the quality enhancement of their own and co-students' learning, but also learn about the process of conducting research within their academic discipline. As Felten (2013) states: "While full partnership may not be practical or appropriate in all SoTL projects, good practice requires engaging students in the inquiry process" (p. 123).

In the discussion following below, I will take a closer look at potential challenges and advantages for both academic staff and learning assistants if learning assistants are to be included as genuine partners in SoTL. This discussion is primarily based on the key concepts that emerged from the research literature, however, feedback from the LAOS evaluations confirms most of the challenges that need to be addressed.

5. Discussion

In *Reflections on the changing nature of educational development*, Gibbs (2013) states that "there has been a noticeable shift towards more sociological perspectives that are concerned with students as a group, with teachers as a community of practice, with values, with learning milieu and with local cultures" (p. 9). This shift toward a community orientation is in line with Barr and Tagg's (1995) *learning paradigm* where the focus in the institution's work lies on creating "environments and experiences [...] to make students members of communities of learners that make discoveries and solve problems" (p. 15).

This shift has also brought about a change in the conventional roles of academic staff and students, with an expectation of teachers and students collaborating on classroom teaching. Current research describes this process not only as "difficult and destabilising, effortful and provocative" (Healey *et al.,* 2014, p. 21) but also as "troublesome and threatening for staff and challenging for students" (Tong *et al.,* 2018, p. 38). In this re-negotiation of roles, SoTL can "provide a safe space for contestation, collaboration, and dialogue" (Fanghanel, 2013, p. 67). By collaborating in SoTL, both academic staff and learning assistants get the opportunity to see teaching and learning from the other's perspective (Fanghanel, 2013, p. 65; Tong *et al.,* 2018, p. 92) and to openly examine their own assumptions about each other and about teaching and learning processes. This is especially important in LAOS, where academic staff and learning assistants have a twofold relationship, not only as teachers and students, but also as co-teachers and co-designers of learning.

For academic staff, inviting learning assistants into SoTL can represent a double challenge to their identity as teachers. First, they would have to critically look at their own teaching practice and to re-establish their professional identity, this time not as professional academics but as teachers. Second, they would have to invite the learning assistants into an open examination of what they themselves might perceive as 'pedagogical flaws' (Bass, 1999; Chick, 2010a). Many course teachers view learning assistants as students who are neither professional researchers nor academically or pedagogically qualified staff and therefore do not have much to contribute (Allin, 2014, p. 98; Tong *et al.,* 2018, p. 92). Evaluations from LAOS show that this perception is shared by the learning assistants. Even though both the core modules and the course-specific follow-up aim at providing them with a holistic understanding of their role within a wider educational context, they still find it difficult to see the relevance of this knowledge and the potential that lies in their expertise as students and learning assistants. If the learning assistants are not able to see themselves as "differently situated knowers with insights to share as partners in exploration" (Tong *et al.,* 2018, p. 89), neither will their teachers.

Chick and Poole (2014) claim that "to truly understand the students' lived experiences, we must delve into just what they think learning entails in the first place" (p. 2). Learning assistants who have personal experience from closely following up students in student-centred learning activities are a vital source of information. Being students themselves, they also have an additional awareness of "where they and their peers are coming from and, often, where they think they are going" (Cook-Sather *et al.,* 2014, p. 15). Having the opportunity to get access to this knowledge is one of the biggest benefits for academic staff.

For the learning assistants, participating in SoTL could contribute significantly to the development of their competencies as students and future professionals. Not only would they learn how to conduct collaborative research as part of the disciplinary community, "being involved in the production of knowledge through research-based education can encourage students to develop a critical awareness of how knowledge is created and socially

situated, with a view to encouraging critical reflection on how they have been moulded by their own experiences" (Kincheloe & Steinberg, 1998). These meta-cognitive skills usually present a big hurdle for students that is often addressed by specific general skills courses. In SoTL, learning assistants could acquire these skills in a meaningful way while being less focused on the vocational usefulness of these skills (Driscoll, 2014).

To conclude this discussion, engaging learning assistants as partners in SoTL can lead to positive outcomes for both learning assistants and staff, as summarized by Cook-Sather *et al.* (2014). For students, this would be "enhanced confidence, motivation, and enthusiasm; enhanced engagement in the process not just the outcomes of learning; enhanced responsibility for, and ownership of, their own learning; [and] deepened understanding of, and contributions to, the academic community" (p. 100). For academic staff, the outcomes would include "transformed thinking about and practice of teaching; changed understandings of learning and teaching through experiencing different viewpoints; [and] reconceptualization of learning and teaching as collaborative processes" (ibid.). In the following section, I will reflect on what needs to be done to change the current situation so that both academic staff and learning assistants engage more in developing genuine pedagogical partnerships.

6. Reflection and implications

According to Barr and Tagg (1995), "the Learning Paradigm ends the lecture's privileged position, honoring in its place whatever approaches serve best to prompt learning of particular knowledge by particular students. […] In other words, the Learning Paradigm envisions the institution itself as a learner" (p. 4). If student-staff-partnerships are to "transform institutional cultures by harnessing the strength of the relationship between learners and teachers working together" (Tong *et al.*, 2018, p. 28), they need to "become part of the culture and ethos of the institution" (Healey *et al.*, 2014, p. 26). Regarding the LAOS program at NTNU, the discussion above showed that formal support by institutional leaders and an explicit communication of the educational developers' vision might not be enough to make academic staff see past existing organizational structures. According to Stålsett (2009, p. 29f), this could be due to the fact that each individual brings their own preconceptions and beliefs into a community. Student-staff-partnerships as can be seen as a 'threshold concept' that requires both "an ontological as well as a conceptual shift" (Cousin, 2010, p. 2). Both academic staff as well as learning assistants need to become aware of the structures and assumptions that influence their relationships, and to recognize that "different participants have different things to contribute as well as to learn" (Brew, 2006, p. 163).

For the LAOS program, this implies a change of focus in the communication within the institution. Until now, the course-specific follow-up has been imposed on academic staff as part of their contribution to the learning assistants' competency development, with the learning assistants 'left hanging' between the requirements by the Educational Development Unit and the reality in the academic departments. Gibbs (2013) warns that "while being strategic and working with the institution seems to me essential if you want to have a wide impact […] educational development can become to be seen as a tool of oppressive, and ignorant, management if it is not careful" (p.12). For LAOS, it then becomes important to counterbalance the existing top-down communication with a bottom-up facilitation that secures support from both academic staff and learning assistants. The following steps would be necessary to achieve this:

Regarding academic staff:

1. Better information on the LAOS vision and the academic departments' role in the program.
2. Additional support in developing course-specific modules.
3. Increased awareness of the learning assistants' potential contribution to quality enhancement.
4. Increased knowledge about the Scholarship of Teaching and Learning.

Regarding learning assistants:

1. Better explanation of the pedagogical components of LAOS (as presented in figure 1).
2. Increased awareness of their potential contribution to quality enhancement.
3. Increased knowledge about the Scholarship of Teaching and Learning.
4. Closer follow-up by the Educational Development Unit throughout their first term of employment.

In conclusion, the following statement by Barr and Tagg (1995) seems quite fitting: "it will take decades to work out many of the Learning Paradigm's implications. But we hope here that by making it more explicit we will help colleagues to more fully recognize it and restructure our institutions in its image" (p.14).

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Programa de iniciación a la INvestigación EDucativa

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Abstract

In this paper, the launching program for INvestigation-Action EDucativa (INED), within the annual training call for university teachers organized by the Institute of Education Sciences (ICE) of the Universitat Politècnica de València (UPV) is presented. This program responds to the needs of teachers who initially started out with a professional background and therefore require training to advance in the process of professionalization of their teaching skills, aligned with the concept of scholarship and the movement generated around it. The proposed program is formulated as an action research to promote the improvement of teacher training approaches in higher education. The objectives are specified in provide Experiences in an innovative training proposal for university teachers in a scientific-technical educational context. Generate a learning community among professors and specialists in university pedagogy through a methodology of peer learning in order to lead a training project. Analyze the previous conceptions of the teachers about teaching-learning processes to move towards quality learning. And, establish a path of professional development for university teachers according to the model of scholarship. The proposed methodology falls within the scope of learning communities, so both the design and the implementation involve teachers from the university with a background in educational research, pedagogical advisors and experts in different thematic areas related to research in higher education, as well as the teachers participating in the training program. Requirements for access to the program and level of commitment on the part of the participants have been established. In this first edition, 25 teachers have been selected, based on criteria of teaching experience, participation in educational innovation projects and pedagogical training. This communication describes the modules, strategies and training sessions carried out in each of the phases of the program. Finally, some results on the development of the program are presented from different perspectives: the participants, the training team and the mentors.

Resumen

En este trabajo presentamos el programa de iniciación a la INvestigación-acción EDucativa (INED), dentro de la convocatoria anual de acciones formativas para el profesorado universitario que organiza el Instituto de Ciencias de la Educación (ICE) de la Universitat Politècnica de València (UPV). Este programa responde a la necesidad del profesorado que parte con un bagaje profesional y requiere de formación para avanzar en el proceso de profesionalización de la docencia, alineado con el concepto de scholarship y el movimiento generado a su alrededor. El programa se formula como una investigación-acción para promover la mejora de los enfoques formativos del profesorado en la educación superior. Los objetivos pretenden experimentar una propuesta formativa innovadora para el profesorado universitario en un contexto educativo científico-técnico; generar una comunidad de aprendizaje entre profesores y especialistas en pedagogía universitaria a través de una metodología de aprendizaje entre iguales, con el fin de liderar un proyecto formativo; analizar las concepciones previas de los profesores sobre los procesos de enseñanza-aprendizaje para avanzar hacia un aprendizaje de calidad y establecer una vía de desarrollo profesional para el profesorado universitario acorde con el modelo de scholarship. La metodología propuesta se inscribe en el ámbito de las comunidades de aprendizaje, por lo que tanto en el diseño como en la puesta en práctica participan profesores de la propia universidad con bagaje en investigación educativa, asesores pedagógicos y expertos en distintos ámbitos temáticos relacionados con investigación en educación superior, así como los profesores participantes. Se han establecido requisitos de acceso al programa y unos compromisos por parte de los participantes. En esta primera edición, han sido seleccionados 25 profesores, atendiendo a criterios de experiencia docente, participación en proyectos de innovación educativa y formación pedagógica.

1. Contexto

En este trabajo presentamos el programa de iniciación a la INvestigación-acción EDucativa (INED), dentro la convocatoria anual de acciones formativas para el profesorado universitario que organiza el Instituto de Ciencias de la Educación (ICE) de la Universitat Politècnica de València (UPV). INED responde a la necesidad del profesorado que parte con un bagaje profesional y requiere de formación para avanzar en el proceso de profesionalización de la docencia, alineado con el concepto de Scholarship of Teaching and Learning (SoTL). El programa que se formula como una investigación-acción para explorar nuevas propuestas de apoyo al desarrollo profesional docente, sigue una metodología que se inscribe en el ámbito de las comunidades de aprendizaje, por lo que tanto en el diseño como en la puesta en práctica participan: profesores con bagaje en investigación educativa (mentores de la UPV), asesores pedagógicos (ICE), expertos en temáticas relacionadas con investigación en educación superior y los profesores participantes. En este trabajo se describen los ejes clave sobre los que se hace la propuesta y se analiza el proceso de puesta en marcha, poniendo el foco en las percepciones de todos los que participan en su desarrollo.

2. Desarrollo profesional docente

El objetivo de INED es avanzar hacia una docencia profesional basada en la experimentación de la docencia y sus efectos en el aprendizaje del estudiante, que se apoya en evidencias y resultados contrastados y compartidos con los miembros de la comunidad académica. Partimos de dos ideas clave, la primera se refiere al concepto de profesionalidad académica (SoTL) y la segunda, conecta con el rol que desempeñan los modelos formativos basados en la investigación-acción y el aprendizaje entre iguales (peer review) para favorecer el desarrollo profesional docente.

2.1. Profesionalidad académica

El concepto de profesionalidad académica o SoTL explica qué se entiende por actuar como académicos en la práctica docente. Incluye la experimentación, reflexión crítica y comunicación de resultados de manera que sean conocidos y susceptibles de una revisión crítica por parte de otros miembros de la comunidad académica (Hutchings y Shulman, 1999). Este compartir los conocimientos adquiridos sobre enseñanza y aprendizaje es lo que puede diferenciar a un profesor excelente de un profesor que, además, puede considerarse un académico (scholar) (Kreber, 2002). Es investigar sobre el proceso de enseñanza-aprendizaje; utilizar la clase como un laboratorio para mejorar el aprendizaje; en definitiva, una finalidad de la Universidad (Ramsdem, 1992).

Un objetivo del SOLT es visibilizar lo que hacen los profesores para que el aprendizaje sea posible, pueda ser conocido y evaluado. Esta visibilidad conduce a la investigación y publicaciones (Kinchin, Lygo y Hay, 2008) que, consecuentemente, estimulan la innovación. Si investigas algo relacionado con el aprendizaje, hay que pensar antes qué puedo investigar, buscar ideas y modelos, etc. Para Cross y Steadman (1996) se trata del classroom research, definición operativa del scholarship of teaching, entendido en un sentido amplio, ya que esta visibilidad no se presenta en publicaciones formales, pero las publicaciones son sin duda la forma más obvia de manifestar esta experimentación y reflexión crítica (Henderson y Buchanan, 2007).

Kinchin, Lygo y Ha (2008) sobre el concepto de SolT encuentran que la práctica más común en el ámbito académico se entiende como la integración entre investigación y docencia con un énfasis puesto en la investigación sobre la docencia y el aprendizaje de la propia disciplina o, en un sentido más general. Así pues, un desafío es ayudar al profesorado a dar respuesta a sus preguntas sobre el aprendizaje de sus alumnos, Nicholls (2004) apunta que debemos integrar en nuestra cultura académica este significado de profesionalidad docente como un valor que debe ser reconocido y estimulado. En algunas universidades este tipo de investigaciones no cuentan porque versan sobre didáctica y aprendizaje y no sobre contenidos, pero esta situación está cambiando (Biggs, 1999, 2001). A muchos profesores la docencia es su identidad profesional y responde a su vocación personal. La integración docencia e investigación es un cauce viable para desarrollar más plenamente la vocación docente y otras legítimas aspiraciones profesionales.

2.2. La investigación-acción como vía de desarrollo profesional docente

La implicación del profesorado en proyectos de investigación-acción es una de las estrategias de desarrollo profesional que mejor encaja con el propósito de transformar las concepciones y creencias sobre la enseñanza y el aprendizaje y superar las barreras intrínsecas en los procesos de innovación. La indagación sistemática sobre la propia práctica permite fusionar formación, investigación y acción educativa. De este modo, la transformación de la práctica es el objeto mismo de un proceso investigador que se inicia y termina en esa misma práctica y da como resultado una transformación de la práctica y de las propias concepciones educativas del profesor implicado.

El rigor del método, con sus fases de planificación, acción, observación y reflexión, permite la construcción de un conocimiento práctico que constituye la esencia misma de la profesionalidad docente. El diagnóstico, la hipótesis-acción o la evaluación/reflexión final, momentos clave del método, exigen un diálogo intenso entre la teoría educativa y la situación específica. El resultado es la construcción de un conocimiento propio y situado que está ligado directamente a la práctica y a la transformación progresiva de esa práctica.

La mejora del impacto de su actividad radica en buscar soluciones a ese doble requerimiento de que el desarrollo profesional docente se construya desde la reflexión y la investigación sobre su práctica y contexto y de que ese esfuerzo se enmarque dentro de una estrategia institucional liderada desde los altos niveles de su dirección.

Estas investigaciones suponen un proceso sistemático para analizar la propia práctica y sus consecuencias en el aprendizaje. Comienzan con la identificación de un problema específico o dilema (¿hago esto o lo otro?), o con la propuesta de alguna innovación que se convierten en la pregunta que guiará la investigación. Se trata de cambiar el status del problema cualquiera que éste sea; de plantearlo como algo que hay que remediar, pasar a una investigación sobre la marcha para solucionarlo (Bass, 1999; Hutchings y Shulman, 1999).

Los alumnos son la muestra investigada en condiciones reales del aula. No hacen falta grandes muestras, aunque se pueden acumular datos, coordinarse con profesores, etc. Referente a la metodología, mayoritariamente son estudios cuantitativos, de carácter cuasi-experimental, verificando un cambio en los alumnos (antes y después), comparando resultados con un grupo control o examinando qué tiene que ver con qué (qué tipo de información se relaciona con un mejor rendimiento, etc.).

Kember (2003) afirma que para llegar a conclusiones convincentes es recomendable triangular la información. Es frecuente utilizar instrumentos para medir variables en las que

se espera algún cambio en función de alguna innovación y que no son directamente de rendimiento académico. También son frecuentes estudios cualitativos, grupos focus basados en entrevistas, estudio de casos, etc., o combinando diversas metodologías. En cualquier caso, estos estudios deben tener carácter académico con un objetivo claramente formulado y una planificación.

Se trata de investigar sobre variables que el profesor pueda modificar (enfoques, autoeficacia, motivación, autorregulación, etc.). El objetivo es dar respuesta a las preguntas que puede hacerse sobre cómo aprenden sus alumnos. Esta reflexión debe compartirse, hacerse pública y ser sometida a crítica o revisión para difundir qué innovaciones producen mejores resultados, etc. Esta difusión es necesaria para que esta profesionalidad se manifieste claramente y tenga un reconocimiento institucional. Hay que aportar una información comunicable y creíble (Henderson y Buchanan, 2007), y se suele dar mucha importancia a que estas revistas sean peer reviewed, sometidas a revisión y crítica de otros. Se otorgan premios y distinciones (awards) concedidos a profesores (común en otras culturas académicas). Es frecuente investigar en colaboración con otros profesores, el entrar por este tipo de investigación es una buena experiencia de aprendizaje para los mismos profesores que las llevan a cabo.

3. El Programa de iniciación a la investigación educativa (INED)

Una vez hemos abordado las líneas conceptuales en las que se enmarca el programa INED, presentamos a continuación los objetivos y descripción del equipo formativo.

3.1. Objetivos

Los objetivos de este programa se concretan en los siguientes:

- Experimentar una propuesta formativa innovadora para el profesorado universitario en nuestro contexto educativo.
- Generar una comunidad de aprendizaje con profesores y especialistas en pedagogía universitaria a través de una metodología de aprendizaje entre iguales que aprendan y lideren el proyecto formativo.
- Analizar las concepciones previas sobre los procesos de aprendizaje y enseñanza con el fin de avanzar hacia concepciones en las que el foco sea el aprendizaje de calidad.
- Establecer una vía de desarrollo profesional para el profesorado universitario acorde con el modelo de scholarship.

3.2. Equipo formativo y participantes

En gran medida la filosofía de programa ha dado un gran protagonismo a la red de tutores con dos perfiles: profesores de la UPV con experiencia en investigación educativa (6 mentores), desarrolladores educativos (3 asesores del ICE) y profesores expertos en diversas áreas de educación superior (6 expertos). Este equipo, acompaña a los participantes durante todo el proceso y participa de forma activa en las reuniones de coordinación y seguimiento, las sesiones formativas y las tutorías grupales (un mentor, un asesor pedagógico y cinco profesores participantes).

En esta primera edición del programa participan 25 profesores que han sido seleccionados a partir de criterios de experiencia docente, haber participado en proyectos de innovación educativa y tener formación pedagógica previa. Sus características nos han llevado a considerar unos requisitos de acceso y establecer unos compromisos de todos los participantes (mentores y profesores). Se buscaba un perfil de profesor con trayectoria docente y que formara parte de la masa crítica de profesores implicados con la docencia en nuestra universidad.

La acreditación se reconoce con 5 ECTS e implica haber seguido de manera regular todo el proceso formativo y elaborar el artículo de investigación con el nivel de calidad suficiente para ser publicado en revistas de alto impacto.

4. Fases de INED: Resultados de lo vivido hasta el momento

El programa se estructura en tres grandes fases. La primera corresponde a la iniciación al proceso de investigación. La segunda se centra en el diseño del proyecto de investigación. Y, la tercera, es el desarrollo y difusión de la investigación (prevista para el último trimestre de este año).

A continuación, abordamos el desarrollo de las dos primeras fases que son las que se han implementado hasta la fecha, indicando algunos resultados que consideramos de interés.

4.1. Fase Inicial: Iniciación al proceso de investigación

Todo comienza en una unidad de desarrollo educativo (ICE UPV) con una trayectoria extensa en el tiempo y en variedad de acciones en este ámbito, pero que es consciente de la necesidad de dar cambios cualitativos en las propuestas formativas a sus profesores para poder conectar con el concepto de SolT. En concreto, partíamos de una serie de interrogantes como "¿puede una acción formativa acompañar a profesores experimentados hacía un perfil de "profesor-investigador" sobre su propia docencia?; ¿Qué tipo de diseño sería el más apropiado?; etc.

Este impulso inicial es el que nos moviliza a contactar con profesores de nuestra universidad con cierta experiencia en investigación sobre docencia en sus respectivos campos de especialización y con una sensibilidad especial hacia la cuestión docente. Esta alianza es determinante para el éxito del programa, puesto que ha supuesto una verdadera construcción social del propio programa y de su desarrollo.

Fruto de esta construcción colaborativa es el planteamiento de la sesión inicial, una mesa redonda en la que los mentores narran su trayectoria en investigación educativa. Se planteó un ejercicio de proyección en relación al proceso y producto esperado en el programa "diseñar una investigación y elaborar un artículo científico que pudiera publicarse en revistas de calidad". Previamente a esta sesión, se les pasó un cuestionario a todos los participantes para conocer sus **expectativas** *"aprender a realizar una investigación rigurosa y sistemática, dando un salto cualitativo en la calidad de sus publicaciones para lograr, entre otras cosas, una mayor visibilidad de los resultados de sus trabajos"* y sus **focos de interés**, que van desde instrumentos de evaluación para aprender, a metodologías favorecedoras del aprendizaje activo; impacto de las tecnologías de información en el aprendizaje de competencias, calidad de entornos de aprendizaje participativos, interacción y cooperación entre iguales, etc.

La **segunda sesión** abordó los focos de investigación en educación superior. Su principal objetivo era generar un conflicto cognitivo entre sus ideas previas en relación con las pregun-

tas que se suelen hacer respecto a lo que funciona o no en la enseñanza. De ahí, reformularon sus preguntas iniciales de investigación, tarea que generó un trabajo profundo para situarlas en la perspectiva del aprendizaje y en su concreción.

A continuación, se desarrolló el módulo sobre el "diseño de proyectos de investigación educativa en el aula". En esta sesión se mostraron numerosos ejemplos de investigaciones educativas de estas características y se les facilitaron múltiples recursos para poder comenzar con el diseño de sus propias investigaciones, tales como instrumentos de medida o ejemplos de investigaciones publicadas. Con la finalización de estas sesiones comenzó el proceso de acompañamiento en el diseño de la investigación detallado en la siguiente fase.

4.2. Fase de diseño del Proyecto de investigación Educativa

En esta fase comenzamos con el desarrollo del protocolo de investigación y una guía de proceso. Se ha trabajado fundamentalmente a través del proceso de mentoría con los diferentes grupos tutoriales. Se podría decir que, poco a poco, se avanzaba en la clarificación de lo que querían investigar y cómo iban a hacerlo. En el proceso destacan algunos puntos críticos que provocaron la reflexión de todo el equipo de mentores. Estos puntos se concretan: en la pregunta de investigación, en la revisión de la literatura relacionada y en la comprensión del objeto de investigación al que nos enfrentamos cuando hablamos de educación. Presentamos algunos ejemplos de las preguntas de las investigaciones: "¿Cómo podemos evaluar la competencia trabajo en equipo a través de la realización de un Plan de dirección de proyecto?"; "¿La combinación de screencast y su evaluación es una metodología eficaz para entrenar la reflexión ética?"; "¿El uso de tecnologías puede facilitar la autorregulación de los alumnos para mejorar el grado de consecución de los objetivos de aprendizaje en Diseño de Sistemas Digitales?"; "¿En qué medida las actividades de aprendizaje hacen que los estudiantes opten por un aprendizaje profundo en la asignatura?"

Como resultado de más de dos meses de trabajo, en el mes de julio se llevó a cabo la *sesión conjunta* en la que cada uno de los participantes expuso su protocolo de investigación. El análisis de los protocolos nos permite extraer algunas conclusiones sobre cómo han ido evolucionando. Por ejemplo, en algunos casos, los marcos teóricos reflejan una buena conceptualización del problema que quieren estudiar encontrando respaldo en la literatura científica. Otros han sido capaces de presentar variados instrumentos validados que, redundarán en una mayor consistencia de su investigación. Referente a las propuestas metodológicas se observan problemas para aislar variables, desconocimiento de las técnicas más adecuadas para sus análisis y temor a incorporar una perspectiva más cualitativa en sus trabajos.

4.3. A partir de ahora

Llegados a este punto comienza el curso y con ello el momento de llevar a la práctica sus propuestas de intervención. Conscientes de lo delicado del momento, seguimos trabajando tanto en sesiones en grupos tutoriales como en grupos grandes. Fundamentalmente, el foco se pone en la obtención de los datos y en sus análisis. En el momento en el que escribimos este texto, los profesores están acabando su trabajo de campo para poder analizar lo ocurrido. El horizonte es que en el mes de julio se puedan tener resultados provisionales que se compartirán en una sesión conjunta. Sin embargo, el programa no finaliza aquí, sino cuando logremos que el mayor número posible de participantes hayan escrito su artículo y que este tenga un grado de calidad razonable para ser publicado.

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Reflectivity in heterogeneous groups in Higher Education – the use of portfolios and projects to support individual reflective processes

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Abstract

In higher education, in general, and in faculty development in particular, heterogeneous groups are common therefore different backgrounds of participants need to be considered in learning environments (Bos *et al.,* 2004). Accordingly, teaching strategies are necessary to support individual learning processes and consider heterogeneity as a resource. As central part of the one-year programme of the Centre for Teaching and Learning in Higher Education participating teachers in higher education develop a reflective portfolio (Bachmann, 2015) or a SoTL project (Boyer, 1990) on their teaching practice. As part of a systematic programme review, we conducted a study to better understand the reflective processes of participants as expressed in their portfolios or projects. The overall aim is to improve the support of this learning process in considering the heterogeneity and diverse entry requirements of participants. The results of this study will provide a basis for the re-design of the programme in order to intensify active and individualized learning environments for heterogeneous groups (Bos *et al.,* 2004). In this contribution we focus on the following questions:

— How can the quality of reflection in portfolio and project texts be assessed?
— How does the quality of reflection differ due to varying entry requirements of participants?
— How can we initiate, facilitate and support reflection processes in considering the heterogeneity of participants?

To answer these questions, first a model for analysing the quality of reflection in portfolios or projects was developed based on an extensive literature analysis. Second, portfolios or projects of 8 participants were analysed and complemented with semi-structured interviews with the same participants. One result is that the difference in teaching experience as one aspect of participants' heterogeneity in higher education influences the quality of reflection in the portfolios and project report in a positive way. The motivation as one influencing factor is at least or can even be more important for the reflection level in learning processes. Thus, in the revised programme we could offer choices, provide more specific feedback and support the individual learning processes of our participants with coaching in order to respond more accurately to the needs of our heterogenous audience.

1. Introduction and Aim of the Study

In higher education heterogeneous groups based on experience, discipline, motivation etc. are common, thus so different backgrounds of participants need to be considered in learning environments (Bos *et al.,* 2004).

The aim of teaching strategies is to «bring everyone under one roof» and to consider the entry requirements of everyone (Grotlüschen, 2004). Thus, heterogeneity in higher education is one of the significant factors influencing the choice of didactic settings. According to the «4 Layers of Diversity» (Gardenswartz & Rowe, 1994), which range from personality to organisational level, effects on learning behaviour, learning motivations and learning attitudes must be taken into account (Oppl, 2018). Research results show a connection

between motivation and interest depending on competence, autonomy and relatedness following the "Self-Determination-Theory" (Frey, 2017). Accordingly, we need to develop individualised strategies in teaching in order to meet the learning needs of the participants (Frey, 2017). To accommodate these influencing factors on learning it is necessary to design teaching settings that facilitate individual learning processes. The aim of current teaching formats is therefore to enable an active handling of heterogeneity and to even consider it as a central concept and resource (Oppl, 2018; Knauf, 2016).

As central part of the one-year programme (10 credits) of the Centre for Teaching and Learning in Higher Education participating teachers in higher education participants develop a reflective portfolio (Bachmann, 2015) or a SoTL project (Boyer, 1990) about their teaching development. Participants can choose between writing a teaching and learning portfolio or realising a small research project as final assessment of the programme. Furthermore, the participants can choose the focus of their final work of the programme depending their own background, interests and teaching needs. In a SoTL project a specific intervention will be tested. A portfolio should consist of the teaching philosophy, give an insight in one's own teaching practice and reflect the contents of the programme linking theory to own practice. This possibility of choice is meant to allow for individualised learning opportunities.

As part of a systematic programme review, we conducted this study to assess reflectivity of the participants as demonstrated in their portfolio or project reports.

For the review and re-design of the one-year programme in higher education the research questions are:

- How can the quality of reflection in portfolio and project texts be assessed?
- How does the quality of reflection differ due to varying entry requirements of participants?
- How can we initiate, facilitate and support reflection processes in considering the heterogeneity of the participants?

2. Methodology

To answer these questions, a first step was to develop a model for analysing the quality of reflection in portfolios or projects based on an extensive literature analysis (section 3.1) on the various descriptions of the levels and processes of reflection (table 2 & 3). It consists of 5 dimensions for portfolios and 4 dimensions for projects of analysis in three quality levels (table 3).

The analysis was carried out by using qualitative research methods in order to test and further refine the characteristics of the quality levels in the model. The research strategies consist of participants' written portfolios or project reports analysis by utilizing methods of content analysis and individual semi-structured interviews. These Interviews were conducted with the same participants at the end of the course to align the oral with the written mode of reflection.

The model underwent three rounds of content validation in order to fit the goal of the study. For our study 8 participants were selected to show a wide array of heterogeneity among participants, according to age, gender, discipline, institution and experience in teaching. In table 1 the main participants' characteristics of the sample are summarized.

Table 1
Description summary of the study sample: characteristic of the 8 participants

Acronym	Gender	Age	Experience (years of teaching)	Discipline	Format
P00	Male	+ 50	+ 10	Social Work	Portfolio
P01	Male	40-45	+ 10	Special Education	Project
P02	Male	30-35	5-10	Special Education	Project
P03	Female	+ 50	+ 10	Special Education	Portfolio
P04	Male	35-40	2-5	Marketing	Portfolio
P05	Female	+ 50	+ 10	Special Education	Project
P06	Female	40-45	5-10	Economy	Project
P07	Female	30-35	1-2	Physiotherapy	Portfolio

In a second step the interviews were coded using MAXQDA (v2018.1) according to the model's premises. The codification was executed three times in order to adjust the codes following the research questions.

3. Results

3.1. Model to analyse reflectivity

A model for analysing the quality of reflection in portfolios and projects was developed based on an extensive literature analysis on the various descriptions of the levels and processes of reflection.

Based on Larsson, Anderberg & Olsson (2015), Kember *et al.* (2000), Fund, Court & Kramarski (2002) and Van Manen (1992) our model is a mixture of iterative and hierarchical model and is considering four features of reflection (table 2). The aim of the combination of the characteristic of an iterative model, to move in a cyclical process of reflection, and the characteristic of a hierarchical model of processing in terms of successive levels or categories of complexity in reflection allows to analyse the reflectivity of our participants in an adequate way.

Table 2
Description of the four features of reflection

Four features of reflection:	
1. Components of reflection (Mezirow, 1991; Kreber and Cranton, 2000)	—Content reflection: helps us to understand the subject matter. In essence, we confront our assumptions about the course and what bodies of knowledge are appropriate. —Process reflection: We seek to validate what we do. In essence, how do we engage students as active learners? To obtain evidence of our practice in collecting data from students about engagement, their professional benefits and outcomes. —Premise reflection: requires us, to examine why we teach the way we do by reconceptualising the issues, justifying the approaches taken or suggesting alternatives.
2. Types of reflection (Van Manen 1991)	—Technical reflection: judgment on the efficiency of the means to achieve certain ends. —Practical reflection: examines the objectives and their actual results —Critical reflection: involves making judgments about professional activity or personal action, and placing it in socio-historical and political-cultural contexts
3. Reflection through writing (Fund, Court & Kramarski, 2002):	—Descriptive texts: show, through careful observation, how teaching is done, highlighting the features, qualities, distinctive aspects, in order to furnish a clear and complete concept (one content unit: the topic) —Personal texts: a distinction between the topic of the text and the "I as a teacher" (two content units) —Linking texts: there is a link between the topic, the "I as a teacher" and the previous knowledge and experience (three content units) —Critical texts: argumentative because the topic is discussed from different angles, including the topic, giving opinion, previous knowledge and experience, and literature (four content units)
4. Reflection through portfolio writing (Larsson *et al.*, 2015)	Examines reflection in the following aspects: —What? (subject matter) —Why? (teaching philosophy) —How? (teaching and learning methods) —Effects on students' learning —Linkage between theory and practice.

The consultation of these concepts helped to design the following model for the analysis of portfolios and projects, based on three reflection levels: descriptive, reflective and meta-reflective (table 3) along the five dimensions of the fourth feature (Larsson *et al.*, 2015). We adapted these dimensions for the projects.

Table 3
Description of three levels of reflectivity

Descriptive	Reflective	Meta-reflective
On the descriptive level a text shows: — Understanding of concepts without reflecting upon its significance in personal or practical situations (Kember, 1999). — Understanding or comprehension without relation to other situations. (according to Bloom's taxonomy) — The use of existing knowledge, without attempting to appraise that knowledge, so learning remains within pre-existing meaning schemes and perspectives. — It's considered a superficial critical level of reflection. — A descriptive account is a superficial analysis of data	On the reflective level a text demonstrates: — A critique on assumptions about content or processes; raises questions; does not take for granted a situation. — An exploration of one's own experiences in order to lead to new understandings and appreciations. — Questioning one's own way of thinking and trying to think of a better way. — Thinking, reflecting and re-appraising the experience over one's own activities and considering alternative ways of doing it to improve next performance. — Examining possibilities before reaching a conclusion. — A thorough and systematic analysis of data, resulting in a justified judgement	On the meta-reflective level a text demonstrates: — A critical review of pre-suppositions. — A reflective thinking through which someone can transform his/her mindset. — An awareness of one's own mindset, perceptions, thoughts, feelings or actions (Mezirow, 1991, p. 108). — A deeper understanding of the nature of learning, e.g. how knowledge is acquired, how understanding is formed (Van Manen, 1991) — Possibilities to extrapolate experience/method/intervention to a wider practice. — A change in the way of looking at oneself as a result of the course, for example in having discovered faults in previous believes. — A significant change of perspective in, taking critical distance

3.2. Selected results

Given the high level of heterogeneity of our participants (from junior to expert, from lecturers to professors, from a broad range of disciplines and backgrounds), the approach of our analysis is concentrating on reflective processes across disciplines and various experiences. The analysis of the 8 reports revealed the following results:

— Some participants show a low-mid level of reflection (3 cases) but most (5) show a higher level of reflection in that one's own actions are critically questioned, and methods are consciously chosen on the basis of theoretical knowledge on the one hand and experience gained in their own teaching on the other.
— There is a difference between junior and expert lecturers concerning the written language and how much paragraphs in the text are visible on the reflective level.

Participants that are used to reflect on their teaching demonstrate in their portfolios and projects more often the reflective level and can move to the meta-reflective level. The reports of juniors (2) are more descriptive.

— Only experienced lecturers chose the option of a project. One participant explains in the interview that the project seemed more efficient given that for each module a written reflection had to be done. Because a project offers the possibility to test and validate a new intervention in teaching. Another experienced lecturer decided consciously to write a portfolio so that an encompassing view of the personal skills set and specialities in teaching could be demonstrated.
— Two out of four project reports were quite descriptive. Both participants attended the programme with the primary aim to acquire the certificate. The two other projects demonstrated a high quality of reflection.
— In 3 reports (1 portfolio and 2 projects) even some meta-reflective elements were demonstrated. One other project report was particularly standing out because of its mainly reflective and meta-reflective level.
— All 8 interviews mainly consist of statements on the reflective (61 codifications) and descriptive level (44 codifications). One interview is outstanding with meta-reflective statements (6 codifications). One interesting statement is concerning teaching strategies to support students in critical and independent thinking. The statement is underlined several times during the interview and includes arguments towards different approaches in teaching, like agile higher education, learning environments on equal footing with students etc.

The hypothesis that experienced lecturers demonstrate a higher reflective level could only be confirmed in 3 of 5 cases. In 2 cases the reports of experienced lecturers were mainly descriptive. In this regard the interviews gave additional information. In one of those 2 less reflective cases a participant admitted that he could have benefited more from the programme if he had been more motivated. Because his main motivation was to get the certificate he focused on this aim and not on the most possible learning effect.

Not only the experience in teaching is influencing the reflectivity of participants, but whether they work or are involved in research besides teaching, are relevant factors too. Researchers can be used to critical thinking and analysing situations from a distance. The case of an experienced lecturer working in research and a junior lecturer working as therapist in a health profession revealed the question how learning processes of participants with different backgrounds could be supported in considering more specific the individual needs. Focussing on the reflection level could evoke the conclusion more teaching experience provides a higher level of reflection in portfolio or project reports. It is important to consider the different entry requirements of these two participants, therefore the need of facilitating individualised learning processes becomes inevitable. As pointed out in the interview, the attendance in the programme could initiate a relevant development of this junior lecturer, especially through the confrontation with the process of reflection and by learning theories.

4. Conclusions

In analysing the results, we get indications for the re-design of our programme.

One conclusion is that the motivation of participants is influencing the reflection level too. If a participant is attending the programme because of the certificate in higher education

is relevant information for the review of the programme because it reveals the importance of the motivation in higher education. If the aim of attending such a programme is to get the certificate the reflectivity in the final assessment can be visible influenced.

One aspect of the heterogeneity of participants in higher education is the difference in teaching experience. This aspect influences indeed the reflection level in the portfolios and project reports. But it is not the only influencing factor. The motivation is at least or can even be more important for the reflection level in learning processes.

So, what does it mean for the re-design in knowing that we have to deal with such wide range of heterogeneity in our participants? Consequences could be to offer choices, provide more specific feedback, to put a focus on reflective practice during training based on our model and to support the individual learning processes of our participants with coaching in order to answer more accurate to their needs. Additionally, it could mean that projects seem to be more suitable for more experienced and portfolio for junior lecturers. These options confirm the findings of Oppl (2018), Knauf (2016) and others to enable an active handling of heterogeneity and to even consider it as a central concept and resource. This aims at more targeted and individualised learning environments and to offer different assignments depending the background of participants.

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Using the technology MOSO to support the teaching observations in Collegial Intervision in teaching development of academic staff

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Abstract

The presentation based on this paper presents the findings of an action research study at Roskilde University (Denmark), where the educational development team used new software, MOSO, as a tool to support teaching development of academic staff through the process we call *Collegial Intervision* (CI). MOSO is a research-based software platform for practical teacher training. It was introduced to enhance CI – a specific approach to teaching development based on peer observation of teaching (POT). At RU, the CI process consists of academics working in small teams to observe a peer's teaching practice, and then collegially discuss and reflect on strengths and areas for improvement. An going challenge in the *Intervision* dialogue sessions has been a tendency for generalized and abstract discussions, rather than critical reflections on specific observed practices. Based on the hypothesis that this is a result of the quality of the observation notes and a time delay between observation and dialogue session, it was decided to pilot MOSO in this semester as its introduction, with capabilities to synthesize written notes, photographs and video of teaching observations, could represent a way of addressing these concerns. The action research study described here focuses on evaluating the impact of MOSO, through an analysis of how its use is influencing the teaching development process in three *Intervision* groups in one semester. The objective of the action research study is to explore if the use of MOSO technology effectively addresses the challenges described. The action research study makes use of multiple empirical data sources, including observations of teachers as they use MOSO – both in the observation of teaching and in the reflective discussion sessions afterwards. In addition, the dataset includes the course evaluations. While this paper briefly outlines the current preliminary observations, the presentation at the conference will include the additional findings of the action research study, which will be finalised in May at the end of the semester.

1. Collegial Intervision – A Teaching Development Method

1.1. Description of the CI at RU

CI is a method of teacher and teaching development at Roskilde University (RU) based on observations of teaching (which may include either teaching to classes or project and research supervision) followed by a reflective dialogue among peers. RU has implemented CI since 2011, with it being mandatory for Assistant Professors and voluntary for other academic staff. Interested PhD supervisors may also volunteer to participate in the CI process. Although the literature uses different terms for processes where colleagues, seniors or Human Resources (HR) personnel observe teaching —either peer observation of teaching (POT) or peer review of teaching (PRT) depending on the goal and the process— the implementation of CI shares similarities with the concept of peer observation of teaching.

CI at RU is aligned to the activity that in the international Higher Education literature is called "peer observation of teaching" (POT). Hendry & Oliver (2012) provide a broad and quite simple definition of POT, that "Peer observation is the process of colleagues observing others in their teaching, with the overall aim of improving teaching practice" (p. 1).

McMahon *et al.* (2007) pointed out in their study that in POT, teachers have agency to make decisions that allow them some control of the different dimensions of the process. It is this sense of control that most influences the learning process of the teachers. They outline six dimensions where teachers may exert control, including the information from the process and the planning of the different elements of the process. For example, it has significance whether it is an observer equal (peer) to the teacher or someone the teacher has chosen or whether it is a centrally chosen observer (a leader or an HR consultant) (McMahon *et al.*, 2007: 510).

These dimensions arose as a result of written reflections from 22 trainers who participated in a peer observation program. Teachers may have control over (McMahon *et al.*, 2007, p. 506):

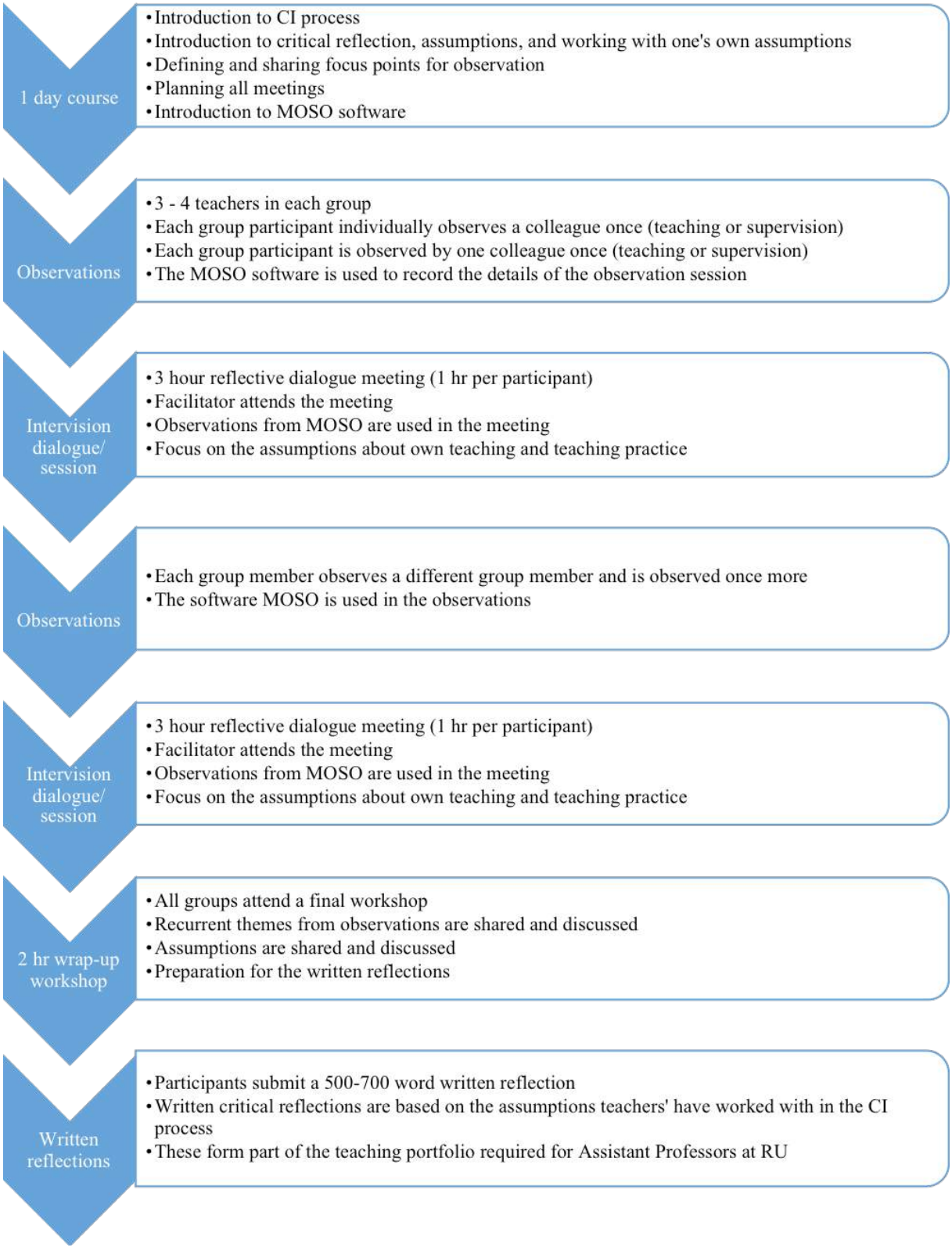
1. whether they want to participate in POT (the freedom to choose),
2. the choice of observer,
3. the observation focus,
4. how feedback should be given and how documentation of feedback should take place,
5. all data / information from the course,
6. what should happen as a result of POT including possible future participation in POT.

In contrast, in a Peer Review of Teaching (PRT), the other term used in the literature, others rather than the teacher typically determine these six dimensions, while in POT, to a greater or lesser degree, it is something the teacher has control over. One can argue that there is a continuum of control and co-influence from POT at one end to the PRT at the other end with less control and influence over the process.

The degree of control in the six key dimensions is a good indicator of how differently the observation processes are implemented. From the literature it is evident that these processes are implemented very differently from university to university (A. Bell & Mladenovic, 2015; A. Bell & Thomson, 2016; M. Bell, 2001; M. Bell & Gyamtso, 2014; Hendry, Bell, & Thomson, 2014; Hendry & Oliver, 2012; Michek, Perutková, & Brichová, 2016; Mladenovic, Bell, & Mladenovic, 2013; Thomson, Bell, & Hendry, 2015). In CI at RU the teachers have control over several of the dimensions (see Figure 1 for the structure, content and process of CI at RU).

One of the intended learning goals of CI is to inspire teachers to critically reflect on their teaching practice. Critical reflection is defined as a reflective process that 'hunts assumptions' (Brookfield, 1995). What makes the reflection critical is the aim to develop "an awareness of how the dynamics of power permeate all educational processes" (Brookfield, 1995, p. 9) and to reach this awareness one has to question one's own assumptions and practices. This is often a difficult process for teachers. A capacity for reflection is important for a teacher in order to be able to continuously develop their practice and to manage the challenges of constant change and the complexity of the teaching profession (Mathiesen & Bjørndal, 2016, p. 230). Continuously, the aim is to enhance the quality of the reflections on practice in the *Intervision* dialogue process.

Figure 1
Structure and content of CI at RU



1.2. Challenges in the CI process

In the eight years of CI implementation at RU some challenges have been noted that are counterproductive to the aim of enhancing the teachers' reflections on practice. The reflective challenge in peer observation of teaching emphasises the relevance of the quality of the observations and of the observation material, which are prerequisites for reflection (Neufeldt, Karno, & Nelson, 1996). During the past eight years I have identified the following challenges:

- the observations of teaching and *Intervision* reflective dialogue sessions occur asynchronously, often with significant delays between observations and sessions, due to the logistical challenge of time constraints
- in the *Intervision* dialogue session teachers frequently tend to talk generally, using vague phrases such as "This was a fine teaching", and the reflections tend to be superficial
- in *Intervision* dialogue sessions observers seldom use concrete and detailed observations
- some of the observers have scarce notes from the observations and it seemed that by the time *Intervision* dialogue sessions were held, participants often could not remember what was most important to bring into the *Intervision* dialogue session
- often the teachers forgot to identify focus points before the observation which made it difficult for the observer
- the third member of the group who did not attend the observation sometimes found it difficult to attend to the dialogue in the *Intervision* dialogue session
- the observation tends to center around the specific teaching situation without the context of learning goals and the teaching plan
- the *Intervision* dialogue session was often based on subjective comments from the observer and not supported by any other material (such as detailed notes or visual evidence)
- the teachers tend to be very cautious and filtered in their feedback in the *Intervision* dialogue sessions which often leads to superficial reflections and no revealing of assumptions.

With this awareness, ways to support the observation and reflection process were identified. The quality of the observations and the observation material (Neufeldt *et al.*, 1996) was noted to be a factor contributing to many of the challenges. The observations and the observation material are the basis for the *Intervision* dialogue session, the feedback, and hence also for the reflections. A hypothesis developed that if observations could be recorded using multiple methods to support 'thick' descriptions of practice (Mathiesen & Bjørndal, 2016) the subsequent *Intervision* dialogue session could potentially be more comprehensive and more critical. Hence, the reflections may also better enable teachers to recognize and interrogate their assumptions about teaching and learning.

2. Moso as a Digital Tool in the Intervision Process

The introduction of the mentoring and observation software MOSO therefore became a possible solution to these challenges. Because MOSO has the capacity to allow teaching academics to compile, organise and share written notes, visual representations of practice (photographs) and short video recordings of teaching during observations for later reference,

RU decided to pilot MOSO in CI in the spring semester of 2019, and study its effects. Some of the characteristics of the software that made it potentially useful were:

— collective memory (shared notes),
— highly detailed observation notes that all can see immediately after the observation,
— a shared reference for reflections including for the ones not present at the observation, and
— a possibility to pinpoint significant parts of the observation for later reference via the star functionality (MOSO website, www.moso.as, 2019).

The trial aims to enhance the reflection process of university teachers. The implementation of this digital tool is a proactive response to the challenges in the CI process.

3. Research Questions

The purpose of CI is to support teachers to be more reflective in their teaching practice. From this perspective, the research seeks to investigate how the use of MOSO influences both the observation materials and through this the reflection process – both individually and socially in the group.

To achieve these aims, the following research questions guide the study:

— How did teachers use MOSO in observations?
— In what ways do MOSO observation materials reflect 'thick' or rich descriptions of practice?
— How did the teachers perceive the influence of the observations when MOSO is used as a tool for observation and to support the reflections in the Intervision dialogue session?
— Do teachers make connections to specific teaching examples in Invision dialogue sessions?
— Do written reflections indicate enhanced critical reflection, for example by identifying multiple perspectives, identifying assumptions, or recognizing differences between espoused and enacted practices?

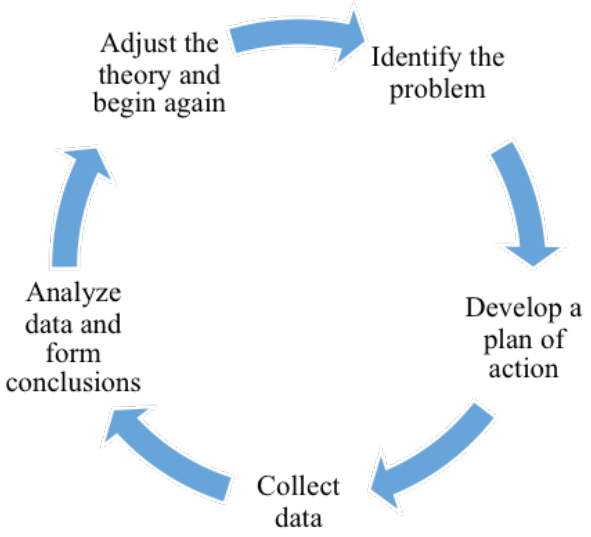
In addressing these questions, a response to the hypothesis that detailed 'thick' descriptions will enable enhanced critical reflection on their assumptions about teaching and learning will be able to be constructed.

4. Methodology

4.1. Action Research Framework

To be able to uncover how MOSO is influencing the reflection process in CI I use an action research framework. My role is to facilitate teachers' professional development. As the person responsible for developing and teaching the course *Collegial Intervision.* As this is my everyday working field, this tool provides a useful lens through which to look at my own working context with a new perspective. Figure 2 illustrates one of the most common ways to picture an action research process.

Figure 2
Action Research Framework (revised from a model from the website: tech4learning.inc, April 2019)



I enacted the framework by first identifying the problem (see section 1.3 for challenges in the CI process). I then developed a plan of action (to implement MOSO – as in section 2), collected data (currently in process), analyzed the data and tentatively began forming conclusions (scheduled for the end of May). These will then be used to adjust the theory and begin again.

4.2. Data Sources

Data collection methods take a qualitative approach (Denzin & Lincoln, 2018). I will be using multiple data sets to provide a range of perspectives to enable reflection on the research questions and evaluate whether MOSO is an effective tool for supporting critical reflection in teacher professional development.

Data collection methods will include:

— researcher observations of the POT participant observers' use of MOSO
— observations of the *Intervision* dialogue sessions (2 sessions in 3 groups = 6 sessions)
— evaluation of the participants' notes in MOSO (how many photos and videos are recorded, details recorded)
— written reflections from the participants both from this semester course with MOSO and from the course last year without MOSO
— a staff survey on their perceptions of MOSO and its influence on their CI dialogue sessions and reflections. Sample questions will include:

- In what ways did you find MOSO to be an effective tool to support your observations?
- What limitations or challenges were there in using the MOSO tool?
- In what ways did the MOSO tool support or inhibit the *Intervision* dialogue session?

- In what ways did the observations in MOSO support or obstruct your reflection on your teaching practice?

Each method correlates to a particular research question as seen in Table 1:

Table 1
Research questions correlation with data

Research Questions	Method
How did teachers use MOSO in observations?	Observations of teachers as they observe peers and use MOSO software
In what ways do MOSO observation materials reflect 'thick' or rich descriptions of practice?	Analysis of MOSO notes
How did the teachers perceive the influence of the observations when MOSO is used as a tool for observation and to support the reflections in the *Intervision* dialogue session?	Survey
Do teachers make connections to specific teaching examples in *Invision* dialogue sessions?	Observations of *Intervision* sessions
Do written reflections indicate enhanced critical reflection, for example by identifying multiple perspectives, identifying assumptions, or recognizing differences between espoused and enacted practices?	Analysis of current and previous written reflections

The combination of these methods and the data will enable an analysis of whether using MOSO as a tool for observation supports 'thick' descriptions of practice including visual representations and short video recordings of teaching. Survey responses capturing teachers' perceptions of the software will be compared with their written reflections and with written reflections from teachers from courses run prior to the MOSO pilot. The benefit of using multiple methods is that it provides "the opportunity to compare the findings from the different parts of the study … focused on identifying patterns of similarities and dissimilarities" (Christensen, 2016, p. 171). I anticipate that through these data, I will be able to get a sense of whether MOSO can facilitate improved critical reflection in *Intervision* dialogue sessions.

5. Preliminary Data Presentation and Conclusions

At the start of the Winter 2019 course, participants were notified that MOSO was being trialed as part of a pilot study so that the educational development unit could learn if it could qualify the process. After this, teaching staff were able to choose if they wanted to participate in the pilot study or if they would rather not use the program. They all chose to attend the pilot study. I supervised and observed seven participants' use of MOSO for the first time in their peer observation of teaching sessions. In my role as a facilitator, I also attend the *Intervision* dialogue session and have observed how participants use their observation notes as a reference in their reflective discussions.

A requirement of participation was that everybody in the course must use MOSO to document his or her observations. Although there appeared to be an initial resistance

from the participants due to not having time to learn a new program, and being insecure about how to use the software, all participants learned how to use MOSO on either on their smartphone, iPad, or on computer, with some participants using two screens at the same time. There have been slight differences in how MOSO has been used in the *Intervision* dialogue sessions. One of the groups had the observations put up on a projector, so everybody could see them during the session. Another of the groups had a shared iPad to look at and a third group chose to each look at their own devices. In each case, everybody used the observations from MOSO actively in the *Intervision* dialogue sessions, both for feedback and for revising and remembering specific parts of the teaching. When at the end of the session they had a shared discussion on a common theme they tended to refer back to some of the specific observations or comments from the observer or teacher. In participating in this way over the course of the semester, I observed that all of them came to either find the program 'super cool' or okay.

Some of the initial feedback on MOSO from participants in the first *Intervision* session meetings included that:

— "I think the raw format was good. AND not normatively"
— "Nice to read them [the notes] afterwards."
— "Good with the text in MOSO"
— "I have been watching videos and pictures a thousand times [of my own teaching].
— "It is the best [to look at the pictures and videos of his own teaching]"
— "I think the videos were really cool, especially when you hadn't been there."

(author's translation from Danish to English)

My initial observations align with the findings of Mathiesen and Bjørndal (2016) who studied fourteen teacher education practicum supervision groups in Norway. They describe the development of a community of practice to state:

> […] a strong culture of sharing is developed, where pictures, video recordings and most of all texts are shared and woven into more active, continuous reflective processes than what the participants have experienced without the use of tablets. In other words, the study provides indications of not only the tablet's impact on students' individual reflections, but also, at least as much so, the potential tablets as artefacts can have for sociocultural learning processes in groups. (Mathiesen & Bjørndal, 2016, p. 242)

These early data reflect positively on the incorporation of MOSO into the *Collegial Intervision* process. Data and conclusions are still in process and will be presented at the conference in June.

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Spatial aspects of teaching and learning: The classroom as a third educator

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Abstract

The differential benefits of teaching in a Student Centered Activating Learning Environment with Upside-down Pedagogies (SCALE-UP) are investigated for a class that moved from a combination of Peer Instruction and Just in Time Teaching to a spatial setting typical for SCALE-UP.

1. Introduction

The Italian educationalist Loris Malaguzzi referred to the room as the third educator. The first educator within this counting scheme, *i.e.* the instructor being in charge of the class, certainly is considered to be important in any teaching philosophy. The second educator, the peer student, is usually at the core of many innovative methods of pedagogy. In fact, many research based instructional strategies developed or refined within various branches of Discipline Based Education Research make good and targeted use of the second educator. Among these are Peer Instruction (PI) and to some extent Just in Time Teaching (JiTT), all described in [1].

The role of the spatial environment and, hence, the third educator, receives special attention in studio formats. For instance, in Student Centered Activating Learning Environment with Upside-down Pedagogies (SCALE-UP) [2] students are seated at group tables. This removes spatial barriers to students' interaction and collaboration which are typical for traditional classroom settings. Moreover the spatial arrangement signals to the students that cooperation and co-construction of knowledge is essential in this class. It also signals that the instructor is not the central and upfront resource for learning since in a SCALE-UP room there is no front anymore.

SCALE-UP has recently gained considerable popularity [3] and has proven to be effective for student learning [2]. Using such an environment as a third educator, however, comes with considerable cost and effort for creating and equipping a suitable classroom. This is in contrast to only involving the second educator, like in PI, which typically does not mandate spatial requirements. In fact, pedagogies are often designed to be compatible with traditional classroom settings.

2. Motivation and ROOM Design

The author has adopted JiTT and PI about a decade ago. JiTT [4] is a teaching philosophy akin to Inverted Classroom with a strong focus on identifying students' difficulties with subject matter. Students' difficulties are diagnosed by means of on-line tasks which students work on prior to class. Instructors use this information 'just in time' to address these difficulties in class. PI [5] engages students via conceptual questions that are based

on student difficulties. Usually electronic answering devices called clickers are used to facilitate PI.

Recently, the author has been able to establish a SCALE-UP environment in his department which allows hosting 48 students in groups of six. This environment has been inaugurated in 2017 with a class having regularly an enrollment of about 50 students. Fig. 1 gives an impression of the environment.

Figure 1
SCALE-UP environment at Ostfalia University.
Students are seated at tables in groups of six.
Pictures were taken during a regular class on Automata Theory

The author's motifs for moving to a SCALE-UP environment have been driven by a desire to teach in an environment which signals certain messages to students as described in the introduction. It has to be emphasized that in terms of pedagogy the author's current implementation of SCALE-UP is rather light. It does not involve fixed groups as advocated in [2] and is best described as using JiTT and PI in a spatial environment typical for SCALE-UP.

3. Research question and methodolody

This work addresses the following question: Are there and what are differential benefits of teaching in a SCALE-UP environment compared to teaching with JiTT and PI in a traditional classroom? In order to answer this question the Automata Theory class taught by the author in 2017 in a SCALE-UP environment serves as data source. Available data includes total scores on the exam, class attendance, and performance on JiTT warm-ups and puzzles. The control group consists of previous implementations of the same class taught in 2015 and 2016, *i.e.* using JITT and PI in a regular classroom.

In JiTT warm-ups refer to on-line tasks students work on prior to class meetings after they have made themselves familiar with the upcoming content by studying the textbook. Puzzles refer to on-line problems students work on after class. They come close to the more traditional end of chapter problems.

4. Findings

No differences could be observed in terms of students' performance on the JiTT warm-ups for all courses. This indicates that there were no relevant differences between the three student populations involved.

Also no statistical differences could be observed with respect to students' performance on the JiTT-puzzles for the 2015 and 2016 courses. While not statistically significant, students of the 2017 class performed about 5% better on the JiTT puzzles than the other two groups. With the spatial environment being the only difference between the various classes, this increase can be attributed to the SCALE-UP environment.

Average class attendance increased statistically significantly ($p<0.01$) from about 60% in both 2015 and 2016 to about 70% for the 2017 SCALE-UP class, cf. Fig. 2. Obviously, the strongly collaborative SCALE-UP environment made it more attractive for students to attend class.

Final exam scores increased noticeably (Fig. 3) with a passing rate of 86% reaching an all-time maximum.

Figure 2
Mean attendance rates of the investigated classes. Error bars indicate standard errors

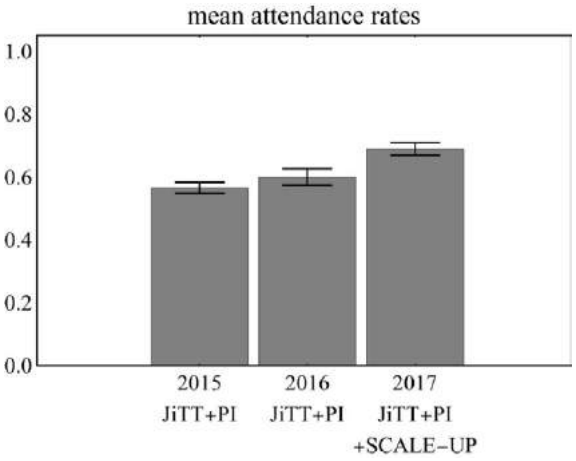
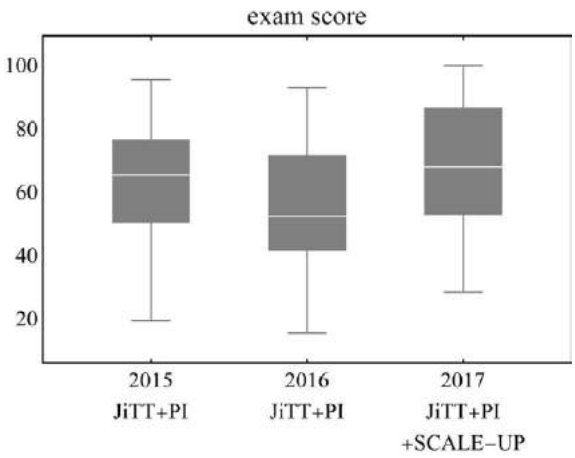


Figure 3
Distribution of exam scores for the investigated classes



5. Discussion and Conclusions

It seems reasonable to conclude that the observed changes are mostly due to the spatial environment of SCALE-UP, *i.e.* the "presence of the third educator." While all student cohorts came roughly equally prepared to their classes as indicated by performance on JiTT warm-ups, students appear to have gained more from attending the SCALE-UP class on a short and longer time scale than their peers in previous years as indicated by the better performance on JiTT puzzles and the exam. Class time in the SCALE-UP environment seems to be particularly valuable for student learning. Students might actually perceive this, leading to the observed higher attendance rate. Indeed in the final course evaluation six out of 41 participating students stated in an open ended question on which aspect of the course contributed to their learning that the room environment supported their learning.

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The interaction between university teachers' well-being and their pedagogical competence

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Abstract

Research indicate that teachers are particularly prone to stress and burnout (Skaalvik *et al.*, 2017). However, previous studies have rarely investigated the psychological well-being of university teachers. This study examines how university teachers' approaches to teaching are related with their well-being. The learning-focused approach to teaching refers to teaching where the teacher aims to support the students' conceptual change and deep understanding, while the content-focused approach is focused on transmission of information. Well-being is explored through the concepts of stress and burnout. The intensity of stress is a predictor of lack of psychological well-being, whereas burnout is a consequence of prolonged stress (Skaalvik & Skaalvik 2017).

The questionnaire responses (N = 69) on burnout, stress and approaches to teaching were analysed with interviews of 20 teachers from a variety of disciplines. Results show that well-being is strongly related with approaches to teaching. The content-focused approach correlated positively with elements of burnout and stress, while the learning-focused approach had a negative correlation with these dimensions. Based on the interviews the early experiences of teaching are specifically stressful due to lack of pedagogical and collegial support. To conclude, it is important to support the development of the learning-focused approach to teaching, specifically among novice teachers; this can have long-lasting impacts in teachers' psychological well-being.

1. Introduction

Research in the past twenty years has vastly expanded the knowledge regarding university teachers' approaches to teaching. These have been shown to be related to students' study processes (Trigwell, Prosser & Waterhouse, 1999), as well as to teachers' emotions concerning teaching (Postareff & Lindblom-Ylänne, 2011). However, uncertainty remains over the well-being of university teachers and how it is related to approaches to teaching. Instead, studies have focused on primary school teachers and found that they are particularly prone to stress and burnout (Aloe, Amo, Shanahan, 2014; Skaalvik & Skaalvik, 2017). The psychological well-being of university teachers is important for the overall health of the individual teacher, the learning of their students (Collie, Shapka & Perry, 2012), as well as their employers from the perspective of teacher attrition (Skaalvik & Skaalvik, 2011). Furthermore, the society in general benefits from the well-being of teachers, because it is an essential requirement in providing future generations with high-quality learning opportunities (Skaalvik & Skaalvik, 2017). Despite the advances in these areas of research, it is not known how teachers' approaches to teaching are related to aspects of psychological well-being. Therefore, conducting a study examining the psychological well-being of university teachers in relation to their teaching approaches provides valuable information currently lacking in this particular area of research.

1.1. Approaches to teaching

For years, university teachers have been evaluated mainly by the expertise they have in their respective fields. However, contemporary research has recognized the importance of pedagogical skills for university teachers. Numerous studies have examined teachers' approaches to teaching (i.e. how they teach). These studies have distinguished several profiles of teaching approaches, commonly characterised as either learning-focused or content-focused (Postareff and Lindblom-Ylänne, 2008). These approaches differ significantly in the planning and delivering of teaching, the roles of both the teacher and the students, as well as the methods of assessment. For example, learning-focused teachers tend to incorporate the students' prior knowledge when planning the lectures, aim to use a wide range of teaching methods and see students as active participants in the learning process (Postareff & Lindblom-Ylänne, 2008). In contrast, content-focused teachers generally design strict lecture plans around the teachers' own interest and expertise, prefer traditional forms of teaching and assessment and see students as recipients of information (Postareff & Lindblom-Ylänne, 2008). A recent study by Cao, Postareff, Lindblom and Toom (2018) found that learning-focused teaching is positively associated with teacher well-being in terms of low levels of burnout among teacher educators. Although there seems to be suggestions of a potential link between teaching approaches and teacher well-being among university teachers, the evidence is scarce and more research is needed on the topic.

1.2. Concepts of well-being, stress, and burnout

Well-being is a broad and relatively ambiguous concept, therefore it must be narrowed for the scope of this research. This study will investigate well-being through stress and burnout. Thus, the focus is on psychological well-being. The complexity of stress is highlighted by the fact that after nearly a century of academic research, no single definition for stress has been universally agreed upon. The Job Demands-Resources model (J D-R) defines stress as the consequence of the interaction between job demands (e.g. work overload, organizational pressure) and insufficient social, organizational, physical or psychological resources to meet these demands (Bakker, Demerouti, de Boer & Schaufeli, 2003). Definitions of stress generally emphasise the prevalence of negative emotions and thoughts as a result of external and internal demands. Stress has been widely researched in many domains, including teaching. In fact, there is a substantial base of empirical evidence about the prevalence of teacher stress (Gillespie *et al.,* 2001; Skaalvik & Skaalvik, 2017), although the majority of this research is in the primary and secondary education context, as opposed to the higher education context.

Burnout is a feeling of exhaustion, cynicism and impaired performance (Maslach & Jackson, 1993). In most cases it is a gradual process as a consequence of prolonged and severe stress that particularly affects people working in roles that consist of providing support to other people (Maslach, Schaufeli & Leiter, 2001; Skaalvik & Skaalvik, 2017). Burnout consists of three symptoms: 1) emotional exhaustion, characterised by fatigue and the depletion of emotional resources, 2) cynicism, relating to feelings of cynicism, irritability, as well as a negative and detached approach towards others, and 3) professional inefficacy, consisting of reduced feelings of personal accomplishment, impaired productivity and decreased morale (Maslach & Jackson, 1993; Maslach *et al.,* 2001).

Although burnout is a consequence of individual stress, it is influenced by the social context (Maslach, 2003). Indeed, the relationship between the person and the workplace is consistently prevalent in burnout literature. This relationship is often defined by imbalance,

for example between job demands and personal resources, or personal effort and just rewards (Maslach, 2003). Skaalvik and Skaalvik (2017) found that time pressures at work were strongly associated with emotional exhaustion, whereas depersonalisation and professional inefficacy were influenced by the teacher-student relationship (i.e. discipline problems and low student motivation). However, the study examined elementary school teachers and therefore it is unclear how this applies to the university context. Otero López *et al.* (2008) investigated the relationship between burnout dimensions and social support in a university context. They found that higher levels of social support were associated with lower levels of emotional exhaustion and cynicism.

1.3. Aims of the study

The aim of this study is to explore teaching approaches, stress and burnout of teachers working in three Finnish universities. Previous studies on this topic have been scarce. Therefore, this study aims to provide a deep and broad understanding of the phenomenon by using a mixed-methods approach combining questionnaire and interview data.

Firstly, this study aims to investigate the relationships between teachers' approaches to teaching and their psychological well-being, namely stress and burnout. It is hypothesised, that learning-focused teaching is positively associated with well-being, based on findings by Cao *et al.* (2018), suggesting a positive correlation between learning-focused teaching and well-being. In contrast, it may be expected that content-focused teaching will be associated with decreased well-being.

Secondly, the aim is to investigate how teachers describe dimensions related to their well-being and detect elements, which might provide explanations for well-being or lack of it through the interview data.

2. Material and methods

2.1. Participants

This study used selective sampling to obtain a heterogeneous sample in regards to gender, faculty, teaching experience and amount of pedagogical education. The preliminary sample from the pilot data included 69 teachers from three Finnish universities. In addition, 20 teachers were interviewed for this study. They represented different disciplines and two of the three universities.

2.2. Data

The questionnaire used in this research combined existing questionnaires previously used in pedagogical research, as well as questionnaires from other domains that were modified to a teaching context. Approaches to teaching were measured with a questionnaire designed for this study (HowUTeach questionnaire). The items were loosely based on a revised version of the Approaches to Teaching Inventory (ATI, Trigwell, Prosser & Ginns, 2005), which were updated based on qualitative data from Postareff and Lindblom-Ylänne (2008), where 98 university teachers described their teaching approaches.

Stress was measured with the single-item question developed by Elo, Leppänen and Jahkola (2003), which asks teachers to evaluate the extent to which they experience stress

on a given scale. Furthermore, the question "to what extent does this type of stress have a negative effect on teaching?" was added to further explore the effects of stress on teaching. Burnout was measured with the School Burnout Inventory (Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009), which was modified from a student to a teacher context.

The interviews were semi-structured and explored similar themes as the questionnaire. The purpose of the interviews were to delve deeper into the teachers' experiences of stress and burnout.

2.3. Analysis

The exploratory factor analysis with varimax rotation provided two scales from the items measuring approaches to teaching. All items loaded relatively strongly to their corresponding factor, which displayed characteristics of learning-focused (LF) teaching approaches (emphasising interaction between the teacher and the students and teachers' reflectivity) and content-focused (CF) teaching approaches (emphasising information transmission and difficulties in teacher-student relations). The exploratory factor analysis with varimax rotation provided three scales from the items measuring burnout: emotional exhaustion, cynicism, and professional inefficacy.

Descriptive statistics were used to investigate means and standard deviations of scales. Pearson correlation coefficient was used to explore relationships of scales. Qualitative data were analysed through inductive content analysis.

3. Results

3.1. Quantitative results

The preliminary quantitative results are based on the pilot data and are therefore subject to change. Descriptive statistics showed the means and standard deviations of the scales (see Table 1). The mean score for LF teaching was noticeably higher than CF teaching. Scores for 'feelings of inadequacy' were the highest out of burnout dimensions, compared to exhaustion and cynicism. Teachers gave higher scores on the single-statement item for work-stress than the negative effect of stress on teaching.

Table 1
Descriptive statistics of quantitative data on a Likert scale (1-5). N = 69

	Mean	SD
Learning-focused teaching approaches	3.88	0.65
Content-focused teaching approaches	2.42	0.67
Exhaustion	1.93	0.82
Feelings of inadequacy	2.27	0.91
Cynicism	1.83	0.85
Work-stress	2.61	1.09
Negative effect of stress on teaching	2.41	0.86

The relations between scales were explored using Pearson correlation coefficient (see Table 2). The following significant correlations were found: CF teaching correlated positively with all three dimensions of burnout; exhaustion, feelings of inadequacy and cynicism. LF teaching did not have a significant correlation with burnout although the relations were negative. However, LF teaching had a negative correlation with the negative effect of stress on teaching. The three dimensions of burnout had significant correlations with each other. Out of burnout dimensions, exhaustion had the strongest relationship with general work stress, but interestingly cynicism had the strongest relationship with the negative effect stress has on teaching.

Table 2
Correlation matrix between scales

	LF teaching	CF Teaching	Exhaustion	Inadequacy	Cynicism	Work stress	Negative stress
LF teaching	—						
CF Teaching	–.143	—					
Exhaustion	.201	.239*	—				
Inadequacy	–.164	.448*	.495**	—			
Cynicism	–.201	.240*	.386**	.650**	—		
Work stress	–.176	.121	.540**	.308**	.349**	—	
Negative stress	–.363**	.213	.307*	.388**	.437**	.396**	—

* = correlation is significant at the 0.05 level (2-tailed).
** = correlation is significant at the 0.01 level (2-tailed).

Further quantitative data analysis will be carried out after all data have been collected. For example, cluster analysis would allow to identify specific groups within the dataset.

3.2. Qualitative results

The interviews with 20 teachers showed that teachers generally described their teaching positively, describing only moderate levels of stress and burnout, although they experienced a high work load. However, most of them described high levels of uncertainty, anxiety and feelings of inadequacy in relation to their early experiences of teaching. They used expressions such as*"I felt enormously anxious"*, *"teaching was painful"* and *"I felt very insecure"* when referring to their first teaching experiences. Around ¾ of the teachers described negative feelings related to the early teaching experiences, even though they were not specifically asked to talk about this phase of their teaching career.

Analysis of the relations between approaches to teaching and well-being from the interview data is still in progress. Preliminary analyses shows that most of the teachers adopted mainly the learning-focused approach to teaching, and did not describe high levels of stress or burnout. However, the following example shows, that developing teaching from content-focused towards learning-focused teaching has positive effects on well-being:

> "I feel very nervous. It has always been like that. Gradually I have become more confident, but everytime the lecture is over I feel relieved. It's quite

a survival every time. Maybe it's because I cannot get a contact with my students. I hope it gets better now because I have new tools for teaching. I feel enhtusiastic because my teaching situations are not anymore only about talking in front of the audience. Somehow it feels empowering."

4. Discussion

The present study aimed to explore teaching approaches in relation to teacher well-being in higher education. It was hypothesised that LF teaching would be associated with improved well-being and that CF teaching would be associated with decreased well-being. According to the hypothesis, CF teaching was positively related with all three dimensions of burnout. While LF teaching was not significantly correlated with burnout or general work-stress, it had a negative correlation with the negative effect of stress on teaching. This means teachers scoring highly on the LF scale did not experience the negative effects of stress on their teaching. This result suggests that while there may not be a significant difference in the amount and magnitude of stress experienced for teachers, the consequences of stress may be different for teachers using different teaching approaches.

The relationship between university teachers' approaches to teaching and their psychological well-being has been unclear until recent years. The findings of these preliminary data support those of Cao *et al.* (2018), who also found a relationship between teaching approaches and burnout among teacher educations,

It should be noted, that the current preliminary paper is based on pilot data with only 69 teachers. A larger data set is currently under collection. The results of the interview data are based on preliminary analysis of the data.

In conclusion, the findings of both the quantitative and qualitative data provide further evidence for the relationship between university teachers' approaches to teaching and their psychological well-being. *Educational Psychology Review,* The results suggest, that well-being of teachers can be improved through developing their teaching towards more learning-focused teaching. The results also show the importance of providing support for novice teachers to reduce the stress and anxiety related to the first teaching experiences. It can be concluded, that providing pedagogical support for teachers not only improves the teachers' abilities to interact with their students and promote their students' understanding, but it may also have positive effects of their well-being.

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The Fish Bowl: Reflexivity of think-aloud processes for faculty and curriculum development

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Abstract

The perspectives from three studies in higher education present evidence for the use of think-aloud protocols as stimulus for reflective practice and curriculum development. The think-aloud method consists of asking people to think aloud while solving a problem and analysing the resulting verbal protocols (Someren, Barnard, & Sandberg, 1994). The method is used to gain a better understanding of information processing, problem-solving, and decision-making practices (Young, 2009). The three projects had different outcomes, but similar goals in that they are all aiming to unravel underlying qualities, approaches, and thought processes.

The first study used episodic narrative with network maps to prompt instructors to think aloud about their teaching networks, the second project elicited student reflections on cognitive processes while working through multiple-choice questions, and the third project used physical spaces to uncover how faculty think about adapting or designing curriculum activities. In these three studies, the think aloud protocol has helped shed light on the important concepts, troublesome knowledge, or overlooked outcomes in developing curricula. At the same time, the think aloud approach has prompted deep thinking and reflective dialogue about assessment, enabled insight into students' problem-solving procedures, and ultimately helped us offer better support student learning.

1. Creating Personal Network Diagrams

Study one utilized episodic narrative with network maps to prompt instructors to think aloud about their personal networks and how they relate to changes in teaching and assessment practices. It is suggested that conversations about teaching, as a type of informal learning, can contribute in meaningful and important ways to postsecondary instructors' professional growth (Thomson & Trigwell, 2018). In addition, study of social networks suggests that bonds in personal networks tend to form when individuals share similar characteristics, value and beliefs, or homophilous (McPherson, Smith-Lovin, & Cook, 2001). In higher education, academics seek out like individuals for informal conversations. The purpose of which might be to "vent about teaching-related issues, to reassure themselves about their teaching, to manage their teaching context, to improve their teaching and student learning, (or) to evolve their teaching, thinking and practice" (Thomson, 2013, p. 93).

The participants in the study were from two medium sized research-intensive universities, one in Sweden (n = 11), the other in Canada (n = 12). Participants ranged in teaching experience and came from a cross-section of disciplines (see Table 1). The protocol was adapted from Poole and colleagues (2016), and included a set of prompts for diagrammatic representation of the participant's personal network. There were five main steps: (1) drawing circles to represent the people they interact with about teaching; (2) indicating which of those people they have conversations that involve literature or

research; (3) drawing lines and arrows to indicate the frequency and direction of the interactions; followed by (4) adding check marks to indicate the value participants see in each interaction; and (5) adding a number to indicate the similarity of the individuals to themselves.

The cognitive processing in the think-aloud was effortful for some. The process of constructing a network diagram elicited statements like, *"this is hard; I think this is from me, from my own growth"* (#110). At each step along the way, participants delved into the reasons behind their conversations. For example, "*I think it was quite a lot of opinions... not specific questions about things, it was more like, what do you think about this?"* (#104).

Table 1
Participant learning areas and status

Discipline	University 1	University 2	Graduate/ Teaching support	Sessional/ Adjunct	Lecturer/ Assistant Professor	Senior Lecturer/ Professor	Head of dept/ manager
Engineering	2	4	1	1		3	1
Health Sciences	2	3			2	2	
Humanities	0	1				1	
Multi/ Inter-disciplinary	2	0	2				1
Sciences	2	1				3	1
Social Sciences	3	3		1	1	2	1
Total	11	12	3	2	3	11	4

Participants also contradicted themselves as they worked harder to think about the drives and direction of conversations. An example of this was a rhetorical question, *"do I learn from them [students]? Not about teaching and learning"* then a pause, followed by *"you know what, I guess I do. I do learn from them in terms of different ways of thinking about topic material, I think."* (#205). Another example was, *"well, there are similarities to all these people; otherwise I wouldn't listen to them.* [Actually] *I don't think that's true, I think that even people who are different, I think I can benefit from them"* (#202).

In terms of teaching and assessment change, the protocol offered an opportunity for overall reflection following the network prompts. The most commonly mentioned entities in reference to assessment change were the limitations of time, and the opportunity to learn from others' expertise. For example, in reference to the opportunity for conversations about teaching, *"we have to be realistic about the time that we have. So if you notice this interaction graph over here, these are all my colleagues and it's not a matter if I want to talk to them or not, it's if they have the time to talk to me"* (#207), or mentioning time as a barrier to assessment change *"desires to do things versus the time (to do it)"* (#206). Participants' comments suggested that interactions with peers were key to adopting new assessment practices, *"I followed the protocol that my colleague had done previously and afterwards I started thinking about what I wanted to know"* (#106), another mentioned, *"in terms of teaching and learning, the other professors, I'd say would be the thing"* (#207). There are many lessons to be learned from the experiences and practices of those teaching in higher education, so it should be noted that the analysis presented here is developmental, guiding processes for ongoing data collection and further analysis.

2. Problem-Solving in Anatomy

Assessments in the anatomical sciences are generally perceived to be based off rote memorization. Moving away from this assumption requires explicitly teaching and assessing higher order cognitive thinking. When considering higher order cognitive assessments in anatomy, the strategies utilized by and taught to students are not well researched. This project describes the use of think-alouds in uncovering students' problem-solving approaches. Our goal was to make learning visible by unraveling student thought processes as they complete multiple-choice assessments in anatomy. The focus is on the cognitive processes, rather than the final product, with the goal of making these processes as explicit as possible during task performance. This required participants to verbalize their thought processes when solving six multiple-choice questions covering five key areas of anatomy.

The questions were designed using the ICE Framework, which stands for *Ideas*, *Connections*, and *Extensions* (Fostaty Young & Wilson, 2000). The ICE framework represents the gradual progression and growth of the learner towards deeper understanding. Ideas are the fundamental, discrete pieces of information that make up the building blocks of learning. Connections are the relationships that students can form among discrete ideas, and connecting new concepts to prior knowledge. Extensions constitute creating new learning and applying knowledge to completely new and novel situations. Prior to the think-alouds, the researchers designed a rubric with prompts corresponding to the different strategies that might be adopted by the students. All students were also asked to complete a practice activity in order to model the depth of responses that they were looking for in this study and make students feel comfortable with this approach. The practice activity consisted of reading the following scenario: "You open the door to your apartment and need to put the milk in the fridge that you just bought. What are the steps you take to complete this task?" Participants were asked to read the question and say aloud everything they were thinking as they were reading the question. After this practice and feedback session, participants were asked to read each multiple-choice question and follow a similar process.

This first phase, which included one-on-one think aloud interviews with ten second-year undergraduate students, was used to inform the second phase of this research. In the next phase, feedback from the individual think-aloud sessions was used to generate a survey that was distributed across anatomy courses at Queen's University. We analyzed and categorized reasoning processes that were used by the 82 students who responded to our survey as well as the 10 students who participated in the think-alouds. At the same time we explored correlations amongst the level of the question, the strategies that were being used, and the likeliness of students getting the answer correct. The qualitative content analysis protocol (Patton, 1990) was utilized to identify strategies that students followed when working through the questions. It also exposed cognitive biases, assumptions, and attitudes towards multiple-choice questions. Amongst the challenges experienced with this approach were: students' tendencies to get distracted and go off topic; their ability to vocalize their thoughts or express limited information; finding the "appropriate" level of researcher prompting; as well as the labour intensive analysis process. The first challenge was not having an opportunity to mentor the students on how to "think-aloud". Even with the practice activity, students found it challenging to verbalize their thought processes. This in turn made it challenging for the researchers to gauge the "appropriate" level of prompting. In spite of these difficulties, using think-alouds allowed greater insight into students' problem-solving procedures, and ultimately helped us offer better support student learning.

3. Developing Active Learning Strategies

Studies have shown that students' involvement in their own learning has a direct relation to their success. Although lectures can efficiently convey material to students, there is concern that students become passive listeners resulting in poor retention of information and decreased opportunity to develop other necessary skills (Armbruster, Patel, Johnson, & Weiss, 2009; Bonwell, 1996; Michael, 2006; Miller & Metz, 2014). An extensive meta-analysis of 225 studies has shown a compelling connection between students' involvement in their learning and their academic success. (Freeman *et al.,* 2014). Research that focuses on the impact of space on teaching and learning has grown with findings that have demonstrated benefits for students, such as improved attendance, participation, engagement, problem solving, attitudes, and conceptual understanding (Beichner *et al.,* 2007; Brooks, 2011; Florman, 2014; Weston, Ferris, & Finkelstein, 2010; Van Horne *et al.,* 2012; Park & Choi, 2014).

Since 2014 Queen's University has identified active learning as one of its institutional priorities. In that time there has been significant investment in the development of eleven active learning classrooms. Alongside the investment of physical spaces has been the development of programs for instructors to explore and implement active learning strategies. These have included workshops, websites, guide books, course design institutes and showcases of teaching and learning to name a few. Although each of these initiatives have some inherent value it has been increasingly clear that specific instructor development for active learning does not fully happen through generic training or manuals. In order to better understand individual instructor's motivations, goals, and fears of using and active learning classroom and implementing active learning strategies it was imperative to meet them "where they are". For these reasons individual meetings were held with instructors in the active learning classroom they had chosen to teach in. Engaging with instructors in this way offered an opportunity to truly understand their intentions for using the active learning space and slowly guide them toward evidence based teaching approaches that can improve students' ability to interact and learn. This personalized approach situated in the actual teaching space has at its core a think aloud protocol to teaching development and support.

In this think aloud individual instructors engaged in an open and exploratory discussion on the space and their course and what they envision themselves and their students doing to better achieve the desired learning outcomes in the course. During the meeting in the classroom instructors were asked to describe a teaching strategy or learning event that they could see using in this teaching space (often something that they had difficulty doing in a traditional classroom). Such a conversation allowed instructors to discover the advantages of the features of the room, discuss the challenges that they can anticipate, and get them to preconceive what they and their students will do. Issues of preparations, instructions to students, setting of groups, and assessment of work were often elucidated.

Comments by instructors after such an experience have highlighted the importance of this approach. With instructors expressing insight into how the space can change their understanding of what active learning is:

> "Personally, being in this classroom has encouraged me to think more critically about what active learning is, how I can use to increase my students' level of engagement and attention."

Thinking about new teaching strategies:

> "I'm surprised how well the space facilitates group work and group discussion. The space has enhanced how both I and my students approach the material."
>
> "A space like Ellis Hall changed my approach to teaching by making me think about: what am I going to do? What can we do with the material? How else can students learn through doing, and learn through working together, and learn through moving around and trying things out and solving problems?"

And th*eir role in helping students learn in this space:*

> "Being in that classroom made me realize that teaching is not about the teacher, teaching is not about me. I realized that it's time to not worry as much about what I am doing as what the students are doing."

The think aloud approach allowed educational developers to support from a place of inquiry and empathy. By taking the time to think and talk about the active learning spaces allows instructors to see how they and their students can use the space, its benefits, limitations and challenges. It also enables an opportunity to develop an approach in the area of greatest need or greatest discomfort, that is specific, timely and directed. Although this method is not quick and can be messy, it is ultimately more effective and provides an opportunity to engage more deeply and develop a relationship with the instructor which is not often possible with other approaches.

4. Conclusion

Using think-aloud processes utilized in these three studies enabled thinking processes to become transparent, allowing researchers to investigate latent aspects of the phenomenon. In the studies of teaching networks and active learning strategies, an academic support model was used for professional development for adapting, adopting or designing curriculum and assessment activities. Initial results of the network study suggest that time was a key limitation, but that peers learn from each-others expertise. It was also personally illuminating for the academics who engaged with the protocol. Reflections of cognitive processes enabled researchers to gain insight into students' problem-solving procedures, and thus better support student learning. In these three studies, the think aloud protocol has helped make learning visible by unraveling thought processes and encouraging reflective dialogue.

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Exploring the Role of the Instructional Skills Workshop (ISW) in Shaping "Backstage" Conversations about Teaching

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Abstract

Since 2015, our institution (a Canadian university) has been engaged in a five-year international partnership with a Caribbean community college. A central component of this partnership is a faculty development program set to building capacity and teaching skills at the college, through the provision of an internationally recognized professional certification program known as the Instructional Skills Workshop (ISW). The ISW is designed to enhance the teaching effectiveness of both new and experienced educators, by strengthening content delivery skills and cultivating student-centered teaching practices (ISW Network, 2019).

While the ISW has trained thousands of post-secondary instructors globally, research on its impact on teaching practice and on its sustainability over time has been limited (Dawson et al., 2014). In order to address the need for more evidence on the impact of the ISW, semi-structured interviews were conducted with twelve faculty members from the college who were enrolled in the program. In these interviews they shared their approaches to teaching, their experience as an ISW participant, and the potential application of the ISW to their teaching practice.

Informed by research on conversations that occur in the "backstage of teaching" (Roxå & Mårtensson, 2009) as well as what Friberg (2016) describes as a new 4M Framework for SoTL (micro-individual; meso-department; macro-institution; mega-beyond institution), this presentation explores the capacity of the ISW to foster an institutional culture of teaching and learning. Our research found that participation in the ISW can encourage the development of supportive cohorts of instructors, that discuss and even hold one another accountable for implementing practices from the ISW in their classrooms. Our findings also indicate however that these conversations often do not transcend the "meso" level, and are confined to pre-existing networks of departmental colleagues who have taken the ISW together.

As a widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement. This session will invite participants to share their experience with similar faculty development programs, and initiate a broader discussion on how such programs can foster "backstage" conversations about teaching.

1. Introduction

Recent scholarship has attended to the increasing prevalence of internationalization initiatives in higher education and the motivations that underlie this shift at the institutional level (Altbach & Knight, 2007; Brandenburg & de Wit, 2015; Daniels, 2013; Qiang, 2003). Educational development is not immune to the pressures of internationalization, and developers from institutions with established faculty development programs are increasingly being invited to share their expertise with emerging higher education institutions (Lee *et al.*, 2013). Although the involvement of educational developers in international partnerships to enhance teaching and learning is becoming more commonplace, these initiatives are not well reported in the academic literature (Willis & Strivens, 2015).

In line with this move toward international educational development partnerships, McMaster University, a mid-sized, research-intensive Canadian university, has prioritized

internationalization within the University's academic and research missions, including its support for educational development and enhancement. In 2014, a collaborative partnership was proposed between McMaster University and the PETNA Foundation (a charitable organization founded by Nicholas and Janice Brathwaite) to establish the Braithwaite International Partnership. Formalized and initiated in 2015, the Braithwaite International Partnership focuses on bringing positive change to the lives of young people in Grenada through the power of higher education. To realize this goal, funding has been dedicated to a series of initiatives developed collaboratively between four partners: the Government of Grenada, the PETNA Foundation, McMaster University, and T.A. Marryshow Community College (TAMCC), Grenada's principal tertiary institution with an enrollment of 2,300 students, of whom approximately 10% are adult learners.

In 2015, a comprehensive needs assessment report was conducted by McMaster University at TAMCC. The report identified five main areas necessitating further development and enhancement: leadership, faculty development, curriculum and quality assurance, student partnership and engagement, and infrastructure for a learning commons. Responding to the findings of the needs assessment, a strategic plan was developed to facilitate the implementation of best practices in teaching and learning through training programs, professional development opportunities, retreats, and international exchanges with the goal of transforming TAMCC into the leading tertiary institution in the region.

Following the report and informed by the needs it identified, educational developers from McMaster University first travelled to Grenada in November 2016 to focus on building capacity and teaching skills with faculty through the provision of an internationally recognized, 24-hour training course and certification program known as the Instructional Skills Workshop (ISW). The ISW is a comprehensive teacher development program designed to enhance the teaching effectiveness of both new and experienced educators, strengthen teacher capacity and delivery skills, foster institutional dialogue and collaboration on teaching and learning, and cultivate student-centered teaching and learning practices (ISW Network, 2019). The ISW has become one of the central components of the faculty development program within the broader Brathwaite International Partnership, and to date 89 instructors at TAMCC have been certified after completing the ISW.

While the ISW has now been incorporated into the faculty development programs of most Canadian universities (including McMaster), and has trained thousands of post-secondary instructors globally, research on its impact on teaching practice and on its sustainability over time has been limited (Dawson *et al.*, 2014; MacPherson, 2011). As a widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement (Bamber & Stefani, 2016; Kenny *et al.*, 2017).

In order to address the need for more evidence on the impact of the ISW, semi-structured qualitative interviews were conducted with twelve faculty members from the college who were enrolled in the program. The interviews aimed to elicit a richer, more nuanced understanding of the long-term impact of the ISW on participants' professional development and approaches to teaching. Informed by research on conversations that occur in the "backstage of teaching" (Roxå & Mårtensson, 2009) as well as what Friberg (2016) describes as a new 4M Framework for SoTL (micro-individual; meso-department; macro-institution; mega-beyond institution), this paper explores the capacity of the ISW to foster an institutional culture of teaching and learning.

2. Methods

In May 2017, an email was sent out by administrators at TAMCC to all faculty who had not completed the ISW during the initial offering of the ISW in Fall 2016, inviting them to express their interest in participating in the training and to complete an application in order to be considered. The Faculty Development Committee at TAMCC reviewed the applications, and selected participants based on their years of experience teaching and the type of courses taught, with an eye toward workshops consisting of instructors with a range of disciplinary backgrounds and teaching experience. Successful applicants were enrolled in ISW sessions held in both June and August 2017 (n=33).

At the end of these workshops, participants were invited to provide their consent to be contacted for a follow-up interview approximately seven months after completion of the ISW, to further discuss the longer-term impact of the ISW on their teaching. All 33 instructors who were in the June and August 2017 ISW cohorts were invited to participate in the interviews, and of those contacted, 12 instructors were interviewed at the main campus of TAMCC in Grenada in March 2018. The interview questions were semi-structured, allowing for an informal and open-ended conversation on the perspectives of instructors at TAMCC on the impact of the ISW on their professional development. Questions explored in particular their teaching experience at TAMCC and prior faculty development opportunities; their motivations for participating in the ISW; what they perceived to be the benefits and limitations of the ISW; the impact (if any) of the ISW on their teaching practice, on student learning, and in their work with colleagues and students; and the applicability of the ISW to their educational context.

The interviews were held in a private room on the TAMCC campus and were approximately 1 hour in length. All interviews were conducted by the lead author and later transcribed verbatim for subsequent analysis. A qualitative data analysis software program (NVivo) was used to thematically code the interview transcripts and to examine relationships in the data. This research was reviewed and cleared by the Research Ethics Board at McMaster University, conforming to standards of ethical conduct in research involving human participants.

3. Results

Frequency analysis of the interview transcripts indicated a prevailing consensus among participants that the ISW was highly beneficial to their teaching development, even transformative, and that there was a level of excitement regarding the potential long-term benefits of their involvement in the program. Regarding motivations for participating in the ISW, some referred to their desire to take the workshop as an opportunity to become more "professional." They described feeling that they did not have sufficient faculty training and that the ISW, as a certified and internationally recognized workshop, would enable them to incorporate best practices in the classroom and to become more confident in their teaching ability after acquiring an additional credential.

Regarding changes in their teaching approach, directly translated into the classroom from the ISW, several indicated that they had shifted away from traditional "chalk and talk" approaches and incorporated more active components into their classes, and observed that this had a significant and positive impact on their students. They perceived that students were more interested in the course content and more engaged, and in some cases performing better on assessments. They related anecdotes that students had become more confident

and open, that they didn't try to become "invisible" in the classroom as much as they used to, and were asking more questions. From the perspective of several of the instructors interviewed, they sensed that students had a greater sense of agency in the classroom, as well as responsibility for their learning.

Instructors from TAMCC who participated in the ISW did express concerns regarding the workshop however. While several participants spoke of what they had learned regarding incorporating more educational technology into the classroom, they also expressed frustration that some of the ISW lessons did not reflect the actual context of TAMCC, particularly in regard to limited technological resources and support. Some also suggested they found the ISW to be too intensive, and requested a more graduated process toward becoming certified. Several recommended that the partnership develop a more sustained, ongoing development framework, such as an extended faculty development series, with a wide-range of workshops and lessons, complemented by ongoing individual support.

In line with this, instructors shared that participation in the ISW could encourage the development of supportive cohorts of instructors, that discuss and even hold one another accountable for implementing practices from the ISW in their classrooms, however these conversations are often confined to pre-existing networks of departmental colleagues who have taken the ISW together, and are limited in their reach. It is worth exploring these perspectives on the impact of the ISW in fostering instructor cohorts, and the ways it can and cannot influence a broader teaching culture, in more detail below.

3.1. The ISW as Catalyst for "Significant Conversations" about Teaching

A common theme threading across the interviews was the importance of the ISW cohort, the community that is established among the colleagues that took a specific ISW together, in sustaining the application of strategies learned in the workshop to the classroom. Several noted that they now check-in regularly with colleagues that were in the same ISW about their teaching, regarding which components from the ISW they're incorporating into their classroom, which they're not, in a way that is supportive and collegial but which also holds one another accountable for translating the ISW into their teaching practice. As one instructor described it:

> "Amongst us who have done the ISW, I find that we ask each other, 'What are you using? How is that working for you?' I've known persons who teach more practical things and they're trying to ask others, 'How does it work in a practical lesson for you?' So, I think there's communication, people are sharing ideas. Sometimes when I'm walking with my flip charts, my coworkers will say, 'You're using one of the things you learned in the ISW today.' That kind of thing." (P10)

Echoing the above comment, others noted the informal, almost organic nature in which these networks or cohorts develop. As another instructor observed: "From time to time we engage in that sort of discussion, informal discussion. I believe that a lot of things can be learned in an informal discussion with colleagues" (P4). Instructors appreciated the ways in which these informal conversations, amongst networks of trusted colleagues who had taken the ISW together, allowed opportunities for sharing their adoption of teaching strategies in the classroom and lessons learned, and even to hold one another accountable. Several noted

that there had been a palpable shift in the way instructors talked about their teaching with colleagues since taking the ISW. Some observed however that despite this shift, instructors can be very protective of their classes, stating that "We don't want other persons to know what we're doing, because we don't want to be judged. We're still a bit closed" (P3).

3.2. Departmental Affiliation and the ISW Cohort Model

Following this sentiment that "we're still a bit closed," some instructors observed that while the ISW had been beneficial in fostering conversations about teaching, only a small circle of people within the 150 teaching staff at TAMCC had completed the ISW, and that for the workshops to have a sufficiently broad impact more, if not all instructors at the college needed to be trained. One instructor made this call explicitly:

> "I would encourage them [administrators at TAMCC] to hurry up and have the other people involved in the ISW because in my little circle not every member has had that experience yet. So then, sometimes when I will talk some people only kind of contribute because they don't have the experience. So there's some excitement for those who have not yet experienced it. So we need to get everybody on board, because now it's like a club, a Club ISW [laughs]. But we talk about it. All of us, we talk about it." (P1)

This sentiment is echoed by another instructor, speaking to the ways in which informal conversations about teaching have remained confined to those that have taken the ISW:

> "So we do exchange ideas, to see what works for this person and they could probably start doing…so we do exchange. But it's from persons who have got the same training and they work within the same department as I am, so it's limited in that way. But we do exchange ideas." (P7)

Here, in addition to pointing to conversations about teaching staying largely within the ISW cohort, the idea of departmental affiliation being a significant factor in further bounding these conversations is introduced. As noted in the introduction to this paper, instructors were recruited for the ISWs by administrators at TAMCC with an eye toward developing cohorts of trained instructors with a broad cross-section of teaching experience and disciplinary expertise, in order to extend the potential impact of the workshop in fostering interdisciplinary collaboration and transforming the institutional teaching culture. Some instructors noted however that their ISW cohorts were clearly defined by the departmental affiliations of the participants, which often limited opportunities to learn from others teaching in similar contexts. As one instructor stated:

> "I'm the only one from my department who did it so it was difficult to interact with the people there. I'm the only one who did it. I didn't get a chance to interact with the other lecturers and see how it really helped us. The next time it comes around, I want at least 5-6 lecturers in my department to take the ISW. I know it's going to help us and it's going to improve the department, and the college." (P6)

4. Discussion

Our research on the experience of instructors at TAMCC who have taken the ISW supports the findings of the existing (albeit limited) body of literature on the ISW that points to its significant and, at times, even transformational capacity to enhance teaching practice (Dawson et al., 2014; Foxe, Frake-Mistak & Popovic, 2017; MacPherson, 2011). There was broad consensus among instructors that the workshop had instilled greater confidence in their professional approach to their teaching, and had equipped them with the tools needed to experiment with lesson planning tools, active learning strategies and other student-centred teaching methods, and to incorporate the use of educational technology where possible.

In addition, they also frequently described conversations with peers in their ISW cohort following participation in the workshop in terms closely analogous to what Torgny Roxå and Katarina Mårtensson refer to as "significant conversations" with trusted colleagues about teaching, that form a basis for conceptual development and learning. They suggest that these conversations often occur privately and informally within the "backstage" of teaching, as opposed to more formal, public, and facilitated "front stage" conversations (Roxå & Mårtensson, 2009). As noted above, instructors at TAMCC often described their post-ISW conversations with fellow workshop participants in this way, highlighting the value of learning from colleagues through informal conversations about teaching, sharing tips and tricks with one another, what's working in their classroom, and what isn't.

Yet the capacity of the ISW to foster significant conversations about teaching was, at least within the context of TAMCC, limited when the ISW cohort lacked disciplinary cohesion and when, for some instructors at least, they were the only members of their department participating in the workshop, and felt a sense of isolation as a result. This in turn constrained their ability to share with their colleagues what they had learned in the workshop, when they lacked the shared experience and language of the ISW cohort. This is perhaps to be expected given how professional identities can be so strongly shaped by departmental or disciplinary structures, assumptions, and practices (Becher & Trowler, 2001; Trowler & Cooper, 2002).

It is important then in offering the ISW to attend to the "Meso" or departmental level of Friberg's 4M framework (Friberg, 2016), and the ways in which departmental or disciplinary affiliation can determine the sustainability of the ISW in teaching practice. Sustainability and long-term impact is of course important for any faculty development initiative, but particularly so within the context of international educational development partnerships, given the often inherent logistical challenges, time constraints, and what Bovill et al. provocatively describe as "the illusory nature of transformed practice" (Bovill, Jordan & Watters, 2015: 16).

Informal conversations about teaching that occur among trusted colleagues (particularly with a shared disciplinary identity) in the "backstage" of educational contexts are often highly valued by instructors who have taken the ISW. They can be a means of sharing, solidarity, and accountability. Our findings have shown however that for some instructors, there is a need for additional faculty development opportunities to sustain and reinforce content from the ISW, and to perhaps formalize these significant conversations about teaching, both within the ISW cohort, but also within departments.

One response to this need is the development of Communities of Practice (CoP), groups of people with a shared concern, passion, or profession, who meet and interact regularly to share information and experiences, and to develop personally and professionally (Wenger, 1998; Wenger, McDermott & Snyder, 2002). A hybrid approach that is both nurturing

and supportive of personal development, but also intentional in its alignment to broader institutional priorities (McDonald et al., 2012; Oliver & Watson, 2017), may be effective in fostering continued conversations and development amongst the ISW cohort, and provide support for those who might feel the ISW itself was too intensive, or insufficient. As a widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement, and complementing the existing workshop with ongoing Communities of Practice may be one way to ensure its longer-term sustainability.

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T5

SoTL eta Garapen Jasangarrirako Helburuak (Agenda 2030)

SoTL and the Sustainable Development Goals (2030 Agenda)

SoTL y los Objetivos de Desarrollo Sostenible (Agenda 2030)

Blended learning beyond borders; the good, the bad and the ugly

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Abstract

The 'Council for At Risk Academics (CARA) is a European charity that was set up to address the risks posed to academics in life-threatening contexts; often those whom are living and working in conflict zones or whom have been displaced from their homelands due to war. CARA administers a number of programmes in conjunction with support from key higher education and professional bodies; working with displaced academics across the world. This English for Academic Purposes (EAP) and study skills project was principally setup in order to facilitate the continuation of the academic lives of Syrian academics displaced to Turkey through enabling them to engage with academic opportunity. The students selected for this programme are busy academics from a variety of different disciplines and are usually in full time employment at their respective higher education institutions. The project takes a blended-learning approach (Breen, 2018) to delivery with the majority of teaching taking place online via an online classroom with periodical intensive in country face-face teaching taking place every three months or so. This paper focuses principally on the critical reflections of a blended-learning practitioner for English for Academic Purposes (EAP) of a low-level displaced Syrian lecturer in Education with some student reflections, one year into the programme. Student and practitioner longitudinal ethnographic reflective data was collected over a five-month span. Data was qualitatively analysed using a priori method for three key themes pertaining to; positive experiences to teaching and learning, key challenges from both teacher and student perspectives and lastly key areas of improvement and redesign needed to better facilitate the key learning outcomes of the project in terms of student engagement with the academy. Results have shown that more dynamic teaching pedagogies such as 'flipped learning' allow for greater use of online face-face- time with lessons spanning over two time zones (GMT and EEST) and furthermore, allow for greater processing time sometimes needed with low-level language learners. It is hoped that this reflective study will facilitate meaningful discussion amongst colleagues to bring together dynamic ideas of enhancing blended learning programmes in order to facilitate further student and teacher engagement in this emerging teaching and learning space.

1. Introduction

Blended learning (BL)has received much attention in the past 20 years with the advances in technology and demand for embedded use across all sectors in a race to become equipped for an increasingly digital age. However, despite recent increases in research and pedagogical interest arising from large-scale policy shifts in many sectors including higher education, remains an area of contention in the literature due to its far-reaching ability to both build bridges from traditional to more contemporary notions of teaching and learning whilst also being able to challenge the very status quo of the academy. Given its 'ever-evolving' and 'responsive nature' to an increasingly digital context the literature does not provide a 'universal definition' (Moskal *et al.,* 2013:16) in which to conceptualise this phenomena. However, for the purposes of this paper we adopt the notion of BL bringing

together both elements of the traditional classroom in 'face-to-face' lesson delivery and also the idea of the 'online classroom' where lessons are delivered via an online platform remotely (Breen, 2018).

The Council for Critically At Risk Academics (CARA) is a charity that was set up to support academics in crisis. In 2017 CARA solicited the support of a number of UK universities in a collaborative project aimed at supporting displaced Syrian academics in Turkey in sustaining their research activity with a view to support post-conflict country-rebuilding strategy. As language was identified as a potential barrier for the majority of academics being able to engage in the wider academy in terms of research output through the medium of English, an English for Academic Purposes (EAP) and academic literacy skills programme was set up. A BL mode of delivery was adopted due to its dynamic and responsive nature in being able to address varying and often competing institutional and individual needs of teachers and students for this voluntary transnational project. It was imperative that a flexible and dynamic mode of teaching and learning that was also cost effective was utilised.

This paper will explore tutor-as-researcher and student insights on the 1:1 online delivery of the EAP programme through an online 'classroom.' As the face-to-face intensive sessions were delivered more centrally by a group of CARA tutors they have not been included in the analysis of results, but have instead been accounted for in the overall progress in language learning achieved by the student through the BL project and in evaluating the effectiveness of the entirety of the programme both online and offline input.

2. The 'Blended Classroom'

The online component of the project was composed of weekly one hour-long lessons delivered via an online portal in the initial year (2017) during UK term-time. The technology utilised for the online-classroom was rather easy to navigate and was paid for via a subscription from CARA. The online classroom interface allowed for the uploading of PDF only documents onto a number of 'sub-classroom' which aided lesson-staging for tutors, as all documents would need to be converted and available for the tutor to 'share' via the online classroom platform.

Furthermore, the student and teacher also had access to an English language text books and some related grammar books which also included audio files. The online portal also enabled the lessons to be recorded and shared via a link to the student. However, other resources available were more tailored to a traditional classroom and so this was an area that the tutor sought to address through materials development. However, the option to 'share screen' was useful in demonstrating the use of a new resource by the tutor to the student, but was only available to the tutor. Due to this challenge at times more dynamic approaches were utilised to overcome specific problems using the online portal. For example the use of mobile technology such as WhatsApp voice recording software for speaking and listening practice or email for ease in homework submission were also used to supplement lessons.

Online lessons were also supplemented by week-long intensive sessions held centrally in Istanbul by CARA for all of the Syrian academic on the programme in Turkey. However, this part of the programme was very separate to the main online-component and was delivered by a team of centralised staff and strand leaders due to the voluntary nature of the project and as a cost cutting measure.

3. Approach

3.1. Participants in the study

There were two participants in this small-scale reflective study. Teacher-as-researcher is an established EAP lecturer with a number of years' experience delivering face-to-face ELT provision ranging from entry level ESOL and General English to Academic English (EAP) programmes in a number of different contexts at both undergraduate and postgraduate level. Moreover, she has experience of working with a wide range of international students from across the globe. She now works on embedding internationalisation strategy at faculty level and reviewing support and opportunity available to faculty international students. She was selected for the project owing to her experience of working with low level ESOL learners of English. This was her first time to engage with a BL programme that was largely delivered online.

The student-participant in the study is an active academic lecturer and researcher in the field of Education at a University in Turkey. He is also a teacher trainer both in Turkey and also most recently in a collaborative project with CARA and his employer in delivering teacher training to north Syrian teachers. At the beginning of the project he was streamed into the 'beginners' strand of the CARA project as his overall IELTS levels was 4.5, but has since made much progress. The student self-selected to be part of the project.

3.2. Study design

Longitudinal ethnographic data was gathered over the span of 5 months following online lessons in order to generate 'thick descriptions' (Dörnyei, 2007) of the BL context from both tutor-as-researcher and student perspectives. Both the tutor-researcher and the student utilised a semi-structured reflective log to conceptualise observations and thoughts following the online lessons. Critical reflection was selected as the most efficient tool in facilitating an ongoing evaluative process of the online teaching and learning context that would also build critical thinking skills in the student-participant (Gibbs, 1988). Furthermore it also allowed the student to become familiar with a framework of assessing experiential learning (Driscoll, 2000) that could be transferred into the students professional sphere. Reflective data was analysed adopting an a priori method of coding for three key themes pertaining to; positive experiences to teaching and learning, key challenges from both teacher and student perspectives and lastly key areas of improvement and re-design needed to better facilitate the key learning outcomes of the project.

4. Results

4.1. Positives

Researcher critical reflections indicate that a blended-learning (BL) online space may facilitate a sense of navigating a new teaching and learning space (Breen, 2017) which may create a sense of novelty and excitement not apparent in traditional teaching classrooms, leading to more pedagogical 'risk taking' (Moskal *et al.*, 2013). Moreover, the researcher observed that it also developed both valuable digital literacy skills and injected greater vigour in conceptualising more innovative methods of teaching delivery and materials

design; many of which were borne out of challenges faced on the BL programme which will be discussed in the following section.

> 'Feel really pleased that *Socrative* worked! I might try something similar to test understanding of today's lesson as a homework task- seems more engaging than just getting him to type an answer.' (Researcher reflection, November, 2018)

Furthermore, positive reflections were also observed pertaining to the ease and fluidity of communication and the ability for the student and teacher to engage in 'natural' and spontaneous discussion often relating to 'real' contexts based outside of the virtual classroom. These reflections clearly foreground the importance of being able to communicate effectively and efficiently when teaching, a point which maybe be easily overlooked in a 'traditional' classroom due to ease and physical proximity of teacher-student, but must be carefully considered and facilitated in online classrooms.

> 'Finally the audio is working today! It was great hearing about his teacher training project - it sounds like such an exciting project. I couldn't quite get my head around him having breakfast in Turkey and lunch in northern Syria every Friday/Saturday for his research project. I'm so proud of him, he's made so much progress since we started …and he's managed to get a grant from CARA- what an achievement!' (April, 2018)

The researcher reflects on the student's marked progress towards achieving a principal aim of the BL project in being able to communicate effectively in English to facilitate further engagement with the academy. This reflection highlights the flexibility of the BL classroom in being able to facilitate the varying needs of learners in the 21st Century (Beetham and Sharpe, 2013) and aiding them to achieve demanding goals through a more dynamic approach.

Due to the nature of the 1:1 online learning space and the scale of this project the data also suggests that deeper insights into students' wider academic and professional goals, beyond the BL programme can be better understood due to the perceived relational proximity experienced on online 1:1 platforms, as supposed to in the traditional classroom where the context is more hierarchical and thus perhaps more clearly defined (Wubbels and Brekelmans, 2005). In this way, such student-insights may be more explicitly addressed and contexualised in the BL course design, seeking to aid learners in working towards the achievement of broader goals and thus impacting on in class student-motivation. To this end, the BL classroom may facilitate greater fluidity and variation in tutor-student relationship dynamics in defining this teaching and learning environment.

Student reflections indicated a positive relationship between the recyclability of; resources for both consolidating learning and also enhancing their knowledge of the field due to their own research interest in teaching pedagogy ; thus creating positive impacts on online student engagement..

> 'Today's experience was useful because of a teaching video.'
>
> 'I would like to use more such videos and educational images, and some activities.' (February, 2018)

Furthermore, these reflections highlight a potential positive correlation between the usability and recyclability of online materials and online tools on overall perceived student

experience of BL contexts. In this way, BL course designers and tutors alike should carefully consider end-user practicalities in developing new online materials and also in utilising new online platforms for BL teaching delivery.

Moreover, both researcher and student reflections positively identified that BL enabled 'real time' lessons and collaboration to take place despite difference in space, physical distance and also in time, across two time zones that would not otherwise be possible. They also indicated that opportunity for implicit cross-cultural understanding was also supported through this online-heavy project. Furthermore, making good efficient use of valuable face-to-face time, demonstrated through achieving lessons outcomes; cultivated higher levels of student-tutor motivation on this project as both were participating in isolation without very much peer or collegial support or interaction.

4.2. Challenges encountered

Researcher critical reflections from the study have foregrounded the importance of the 'online classroom' being both practical in terms of ease of teaching delivery and communicatively efficient, allowing for spontaneous teacher-student interactions to take place. To this end, the biggest challenge noted by the teacher-as- researcher in the study was time taken in achieving this outcome in time taken in; planning and designing suitable activities that were practical and compatible with the online platform, factoring in time to convert and upload documents sometimes several times, extra planning time taken in ensuring that any additional e-learning platforms utilised in lessons were accessible to the learner.

Porter *et al.* (2014) discuss this phenomena in the context of higher education in terms of identifying and addressing the tutors need to incorporate the best of in-person and online teaching methods in creating a learning-conducive BL environment often without any specific training. It is noteworthy that ongoing training for online teaching-heavy courses would be specifically beneficial to account for more rapid advances in learning technologies and for tutors to have the opportunity to gain ongoing practical academic literacy skills training that can be transferred to a number of contexts. Bates (2017) argues that 'rich' teaching methods are demanded in the 'digital age' that provide more multi-modal engagement and contextualised learning outcomes. However, it is acknowledged that given that the nature of this voluntary project, funds were rather limited and were distributed in the most practical and efficient manner in terms of initial technical induction training.

Tutor- as- researcher reflections also noted that sourcing or creating materials that facilitated learning for 1:1 interaction also carried heavy time investments on the tutors part, which may have been eased with greater opportunity for collegial engagement in contexts such as TeachMeets, as most instructors on the CARA project work remotely in isolation, although there is a sizable online community which offers some interaction, face-to-face physical interaction would also provide a further layer of support to new instructors on the programme.

Moreover, inefficient time usage over technical difficulties faced during lesson delivery was the most frequently cited negative experience of the BL classroom, in both the researcher and student reflections.

> 'She was very annoyed by the internet's interruption… My suggestion is to improve the internet, but I know that this is out of our reach.' (Student reflection, March)

To this end, it is important to consider the possible external influences specific to BL that may have negative impacts on teaching and learning quality when selecting learning platforms.

Given the nature of this voluntary transnational project and the professional contexts of both participants in this study being busy academics; juggling competing commitments and projects presented a number of challenges pertaining to the timing and frequency of the online lesson, accounting for time-differences between GMT and EEST and also in terms of physical facilitation of the online delivery of the course in terms of ensuring that suitable office space was available. The researcher utilised a 'flipped classroom' (Soliman, 2016) to counter the time often taken in manging technical difficulties and also to ensure that facetime online was utilised in the most efficient manner. In sum more long- term planning of project delivery may easily resolve some of the challenges encountered relating to frequency and practicalities of online-lesson delivery.

5. Discussion

This small-scale project analysed the experiences of a tutor-as-researcher and a student one year into an online-heavy BL programme over a 5 month period.

Key findings suggest that both researcher-as- tutor and the student found that the online-classroom provided opportunity for developing and working towards goals beyond the classroom such as the development of highly transferable and valuable digital literacy skills. Moreover, the teacher was also able to develop more innovative pedagogical practices as a result of the BL programme. Furthermore, the student participant was able to enhance pedagogical knowledge applicable to his professional context and thus gained valuable insights.

However, to ensure optimal engagement and impact in online-heavy programmes internet speed and online platform accessibility should be carefully considered in addition to the functional capacity and interface of the online classroom for both tutors and students alike; it is of key importance in being able to provide sustainable BL courses and to ensure time-efficiency in course delivery.

Further empirical studies into the potential impact of more closely blended learning outcomes of face-to-face and online delivery of BL teaching and learning projects could perhaps provide deeper insights into better understanding how each learning space can work in tandem with the other.

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Academic Staff Perspectives on Student-Faculty Partnerships: Redressing or Reinforcing Inequity in Higher Education?

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Abstract

Student-faculty partnership has increasingly been understood as both an effective pedagogical approach and a potential strategy for contributing to equity and inclusion in the academy. Because partnership focuses on mitigating institutional hierarchies and developing teaching and learning relationships founded on respect and reciprocity (Cook-Sather, Bovill, & Felten, 2014), it can contribute to dialogue that foregrounds typically marginalized voices and create opportunities for people occupying different institutional and social locations to learn with and from one another (Cook-Sather, 2015). Research also demonstrates that participating in partnership can have important outcomes for students who identify as members of equity-seeking groups, helping to increase their sense of belonging, understanding, and confidence within academic institutions (Cook-Sather & Luz, 2015; de Bie *et al.*, 2019; Cook-Sather *et al.*, 2019).

While research exploring the intersections between student-faculty partnership and equity has considered student outcomes, comparatively little attention has been paid to the experiences of staff members who themselves claim a range of social identities. Given the compelling inequities experienced by university faculty belonging to equity-seeking groups (Pittman, 2010; Martinez, Chang, & Welton, 2017), it is important to consider the extent to which student-faculty partnerships contribute to addressing and/or reproducing these systemic injustices as well.

This paper thus presents preliminary findings from a mixed-methods study exploring the ways in which academic staff at three institutions (in Canada, in the US, and in the UK) perceive and experience student-faculty partnership and its potential to contribute to equity and inclusion in postsecondary education contexts. Drawing from data gathered via an online survey and follow up interviews with participants at these institutions, we consider how faculty views of partnership are informed by their social locations and their related experiences in the academy. The preliminary data highlight a wide range of perspectives on partnership and its relation to equity amongst faculty participants, raising provocative questions about how partnership might reproduce inequities in some respects even as it challenges them in others.

1. Introduction

Student-faculty pedagogical partnerships have been recognized for their potential to contribute to the development of inclusive and democratic learning cultures in postsecondary education (Healey, Flint, & Harrington, 2014). Partnership is grounded in values of respect, responsibility, and reciprocity (Cook-Sather, Bovill, & Felten, 2014), and aims to engage students and faculty in practices of 'radical collegiality' (Fielding, 1999). As such, it offers spaces in which faculty and students can occupy different or non-traditional roles and work together in more equitable ways.

Scholars have noted that partnership holds particular promise for combatting injustices faced by members of marginalized groups on university campuses, pointing out that it can contribute to the development of more culturally-responsive classrooms and/or recognize and support the knowledge of students from equity-seeking groups (Cook-Sather & Des-Ogugua, 2019; de Bie *et al.*, 2019). Specifically, this literature has identified the potential for

marginalized students who are involved in partnerships to create spaces of belonging and build confidence in their knowledge and their work (Cook-Sather & Agu, 2013; Cook-Sather & Luz, 2015; Moore-Cherry *et al.,* 2016). Nevertheless, scholars also acknowledge that some students face barriers to participating in partnership due to their experiences and/or social locations (Bindra *et al.,* 2018; Felten *et al.,* 2013).

While valuable, this focus on students in the partnership literature overlooks the fact that many faculty members also contend with discrimination, injustice, and precarity in the academy. Research demonstrates that faculty belonging to equity-seeking groups, in particular, experience inequities such as challenges to their knowledge and expertise, increased scrutiny, and disproportionate service expectations (Pittman, 2010; Martinez, Chang, & Welton, 2017; James, 2012). Little scholarship has focused on how these entrenched inequities, or other socially-mediated differences in experience, may affect faculty perceptions of partnership, however. Without consideration of such diversity, partnership scholars risk reifying homogenized understandings of faculty and overlooking ways in which partnership might reproduce marginalizing and oppressive practices even if it counters oppression on other levels.

As such, this pilot study draws upon the construct of intersectionality (Collins & Bilge, 2016) to understand how faculty occupying a wide range of social locations and institutional positions, and working within different international contexts, perceive the call to engage in student-faculty partnership. This includes faculty who have participated in partnership themselves, and those who have not. Specifically, we address the following research questions:

1. How do faculty perceive the potential for partnership to contribute to institutional change in relation to equity and inclusion?
2. How do they perceive the fact that partnership discourse often calls for attempts to level faculty-student hierarchies and re-think notions of expertise?
3. How, if at all, do they understand their own identities and social locations to shape their experiences of partnership and/or perceptions of its potential?

2. Methodology

As the study explored experiences of faculty who have and have not participated in partnership in different international contexts, it was important to choose research sites with established institutional partnership programmes. We selected three such sites: one in Canada, one in the UK, and one in the US. The selected institutions differ in terms of size, research/teaching-intensity, and academic offerings.

Participants were recruited in one of two ways: through an email invitation sent via an institutional partnership program contact at their institution, or via direct emails (using publicly available contact information). Participants were invited to complete an anonymous survey and, at the end of the survey, to take part in an optional follow-up interview with a member of the research team. Survey and interview data were not linked to ensure survey responses remained anonymous. In total, 41 people participated in the survey, while 15 elected to take part in follow up interviews.

Interview recordings were transcribed and are being analysed using constant comparative analysis (Merriam, 2009). In an attempt to avoid linear or additive analysis of the data regarding participants' social location, a two-stage analysis was conducted. All members of

the research team first reviewed and open-coded a subset of the interview transcripts. We then individually coded the remaining transcripts, looking for information about the relationships between social location, experiences in the academy, and perceptions of partnership, and about the influence of context. Basic frequency counts were calculated for key survey questions, and written survey responses were scanned for ideas of relevance to the interview code tree. Findings arising from these preliminary analytical steps are presented below.

3. Findings

3.1. Social location and experiences of the academy

Interview participants described a range of ways in which their intersecting identities shaped their experiences in the academy. Several reported having their knowledge and authority questioned by students and/or colleagues, for instance, often connecting these experiences to gender and racialization. For instance, one participant, who identified as a racialized woman, shared, "*students will say things to me ... that they might not say to somebody who was located differently, like in a position of more conventional authority. [...] Students speak very differently, I find, to men particularly, especially if they're older men, if they're white men.*" Similarly, some also discussed being treated more casually and with more familiarity than their colleagues because they are women or women of colour. This was positioned as both a challenge and benefit: it might undermine their authority while also making them approachable to students.

Conversely, some participants noted that they occupy privileged social locations, and attributed the fact that they had *not* experienced issues related to their positionality to that privilege: "*Quite frankly, [social location] was something that I didn't even think was an issue. Now that of course is probably in some way related to the fact that I'm white, of European background, and I don't have any obvious disabilities.*" Others still simply reported experiencing little or no challenge to their authority and position in the academy; participants who felt this way often described their positions as secure, or suggested they paid little attention to questions of social location. As one survey respondent put it, "*I must say my social position/location is not something I think about or really care about.*"

3.2. Social location and experiences of partnership

For some participants, socially-mediated experiences of the academy, like those mentioned above, had an important influence on their willingness to engage in partnership, or on the ways in which they enacted partnership in their teaching/research practice. Again, however, the nature and extent of this influence varied considerably across the data. On the survey, for instance, many participants (n = 19) indicated agreement with the idea that their social locations affect their perceptions of partnership. That said, 12 respondents selected 'neutral' for this question, while 7 expressed disagreement. Perceptions of the potential risk associated with partnership likewise varied. Most survey respondents (n = 28) said that partnership did not feel risky to them, while only seven indicated that it did feel risky, mostly because of time constraints and uncertainty. Some did indicate that social location can increase feelings of risk, however, such as the respondent who wrote, *"I think my gender, race, faith and first-generation status all make me feel acutely vulnerable in different interactions in the university... [This] also means that I approach partnerships feeling, at times, like I may be the more vulnerable partner."* Several interviewees also discussed the risks of partnership in relation to

their institutional locations, often referring to faculty assessment practices in particular. One noted, "*if I put together a partnership with a student … and that falls kind of flat on its face from the university's point of view … that is a risky use of my time.*"

Alongside perceptions of risk, participants described a range of other ways in which social location might mediate experiences of partnership. Some described feeling empathy for and solidarity with (typically marginalized) students who occupied social locations similar to their own, which sometimes led them to engage in partnerships with such students. Participants also suggested that either experiencing or witnessing discrimination in the academy gave them increased awareness of the need for partnership and equity-related change. In this regard, one survey respondent wrote, "*The ways in which my social position makes me marginal (especially gender, sexuality, first-gen status) also makes me realize how deeply important it is to value and encourage a diversity of voices, and work truly IN PARTNERSHIP, so that we aren't just paying lip service to inclusion but are actually willing to change and be reflexive in response to perspectives that may differ from our own*." Others discussed their awareness of their own privilege, with some suggesting this privilege created barriers to effective partnerships (because they felt students perceived them as intimidating, for example), while others noted that it motivated them to make space for other voices through partnership work. On the latter count, one described trying to "*make sure that the classroom is a place that is open to dialogue and where people can feel free to express [themselves] ... Like trying to use white privilege to do that.*"

3.3. Partnership in relation to hierarchy and expertise

Participants were also asked to consider the ways in which they saw partnership practice affecting conceptions of expertise and authority within the academy. There was relatively strong agreement among survey respondents that expanding understandings of expertise is important, and that partnership is an effective way to accomplish this goal (28 and 27 respondents expressed agreement with these statements, respectively). Several interview participants likewise commented that partnership can make space for multiple types of expertise, although some cautioned against overclaiming in this regard, suggesting it might be disingenuous or problematic to ignore differences between faculty and student experience and knowledge.

Survey participants offered more varied perspectives when asked if they agreed that partnership could renegotiate hierarchies (16 agreed, while 6 disagreed, and 13 selected 'neutral'). Some participants claimed that partnership can remove barriers by challenging the expected relationship between faculty and students, while others highlighted that partnership's ability to renegotiate systems of power may be limited by broader institutional hierarchies and/or by the complex operations of power. One participant described, "*there is a power dynamic involved even if you are trying to create a space where the usual professor-student power dynamics aren't there. I don't think that you can ever fully get rid of that*." The range of reported perspectives on partnership's potential to challenge conventional hierarchies and understandings of expertise suggests that while partnership may create spaces of change, it also has limitations which warrant critical reflection.

3.4. Partnership's contribution to equity and inclusion

The dataset likewise reflects mixed perceptions of partnership's capacity to contribute meaningfully to equity and inclusion in postsecondary education. When survey participants

were asked whether they agreed partnership could contribute to equity within the university, there was a range of responses; while 20 respondents agreed, 6 disagreed and 11 selected 'neutral'. Interview participants who argued that partnership *can* contribute to equity suggested partnership allows students to access new opportunities that can grow their skills, confidence, and sense of belonging in the academy. Some also described how marginalized student partners contribute importantly to institutional equity by leading equity-focused projects or sharing perspectives that faculty members who occupy positions of privilege may have never considered.

Many pointed out, however, that it is important to pay attention to who is engaged in partnership activities. While some participants described partnerships that recruited students from disadvantaged backgrounds, others highlighted that, in their experience, students participating in partnership often occupy relatively privileged social positions. In addition, a few faculty members pointed out that discussions of partnership and equity often focus on diversity within student populations while failing to consider the positions of faculty members. As a result, one participant wondered if partnerships may re-marginalize equity-seeking faculty—for example, if a student partner who occupies a more privileged social position challenges the faculty member's authority. A survey respondent likewise gestured to the need to consider distinctions in staff positioning, writing, *"first, inter-staff relations need to embrace partnership to improve equity. There is an imbalance between staff on different contract types which creates a hierarchy."*

Some participants also expressed concerns about partnership's capacity to contribute to equity at an institutional level. As one survey participant noted, "*Institutional change is on the level of structure. Student-faculty partnership is on the level of individual social relations. Individual sets of relationships aren't going to, on their own, change structures*." Moreover, a few participants who agreed with the values of partnership in theory were skeptical of institutionalized partnership schemes. One, for instance, suggested that partnership programs may simply be a part of institutional efforts to market equity to students without introducing meaningful change.

3.5. Influence of context

Participants also made comments indicating that specific departmental and institutional contexts affected their perceptions of partnership and its potential to contribute to equity in the academy. Several, for instance, pointed out ways in which their departmental or disciplinary cultures supported partnership working, making it seem an expected (and thus, ostensibly, less risky) practice: "*I think it would be well looked on by my colleagues, because ... in [participant's department], we support partnerships*." Similarly, others described how this kind of cultural support played out at the institutional level, with participants from the two non-research intensive universities in particular noting that factors like institutional size and identity and student-centred policies and practices support partnership at a fairly large scale. In this vein, one interviewee said, "*This university has been doing student engagement for a long time. It's in mission statements, it has been for many, many years, you know?*"

At the same time, others described broader institutional factors that discouraged partnership even when it might be supported within local disciplinary cultures, such as a lack of recognition of the time partnership takes or a disjunct between the egalitarian ethos of partnership and typical hierarchical university structures. For example, one participant argued, "*it's hard to shift gears when working in a student partnership to try to move toward those types of ideals, versus when you're working in a very different, hierarchical, almost command and*

control type structure in the rest of your responsibilities." A few also noted a comparative lack of appreciation for partnership-style working within their departments, as in the case of the participant who shared, "*I can think of colleagues who have that sort of ethic and value in their work. I wouldn't say it's the majority.*" As such comments suggest, questions of immediate context also have a significant impact on faculty experiences and perceptions of partnership, potentially intersecting with broader social discourses and structures in ways that might exacerbate or attenuate partnership's perceived risks or potentials.

4. Discussion

Taken as a set, the ideas arising from our preliminary analysis make clear the need for further research examining the ways in which questions of identity and social location influence perceptions of partnership and its potential contributions to equity. Rather than pointing toward broad consensus amongst participants, our data make strikingly clear the range of experiences and understandings faculty hold about partnership and its relations to equity. Perhaps most notably, while some suggested that their own social locations had negligible or comparatively unimportant influences on their experiences within the academy and their perceptions of partnership, others noted that identity and positionality affect their perceptions, experiences, and actions in a range of different, and sometimes pronounced, ways. Given this diversity of response, we echo other partnership literature that has called for further attention to faculty and staff experiences of partnership (Kandiko Howson & Weller, 2016), including a nascent body of work that begins to explore the experiences of instructors who identify as members of marginalized or equity-seeking groups (Kupatadze, 2019).

The growing body of literature that focuses on experiences and outcomes of partnerships involving *students* from equity-seeking groups emphasizes the ways in which partnership can contribute to making institutions more equitable both for the individual students involved and more broadly (Cook-Sather & Des-Ogugua, 2019; de Bie *et al.,* 2019; Stanway *et al.,* 2019). At the same time, authors have also begun to explore the complexities and challenges inherent in this approach, including the need to consider the influence of cultural differences within partnerships and across different contexts (Pounder, Ho Hung-lam, & Groves, 2016; Kaur, Awang-Hashim, & Kaur, 2019), the possibility of re-marginalizing equity-seeking students by exposing them to faculty resistance (Marquis *et al.,* forthcoming), and the potential tensions experienced by student participants navigating commitments to different communities (de Bie & Raaper, 2019). Like research that raises the question of which students have access to partnership opportunities (Felten *et al.,* 2013; Marquis *et al.,* 2018; Bindra *et al.,* 2018), these findings make clear the need to take a fine-grained approach to assessing the relationships between partnership and equity—one which attends to distinctions within and among student experiences rather than implicitly positioning students as a homogenous group.

The diverse experiences reported by faculty in the current data similarly underscore that it is imperative for partnership scholars to attend to the influence of positionality and social location within staff populations when considering partnership's potential to contribute to institutional equity. Like other research that emphasizes the range of inequities experienced by faculty who identify as members of marginalized and underrepresented groups (Daniel, 2019; Waterfield, Beagan, & Weinberg, 2018), so too do our data document cases in which faculty from equity-seeking groups experience challenges to their knowledge, disrespect, and inequitable demands on their time. While in several cases, such faculty continue to embrace partnership (perhaps even *as* a practice that helps them navigate such inequities and support

similarly located students to do likewise), it remains the case that the risks and possibilities of partnership are differently felt by differently located people. As such, it may well be problematic and counterproductive to advocate for partnership as a means of redressing institutional inequities without attending meaningfully to the complexities of faculty (and student) social location. To more fully realize partnership's potential to contribute to equity, we need to acknowledge that structural inequities operate *within* faculty and student populations, and to consider the ways in which homogenizing calls to engage in partnership may themselves, in some ways, be harmful.

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Documentary Film, Pedagogy, and Social Change

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Abstract

Acknowledging the increasingly common use of documentary films within postsecondary education (e.g., Swimelar, 2013), and the broader function of film as a form of 'public pedagogy' (Giroux, 2008), this study examines the ways in which university students learn from and respond to social justice documentaries. Whereas much previous research has focused primarily on the representational practices of documentary films themselves, we instead concentrate on questions of viewer response, gathering and exploring empirical evidence about students' perceptions of documentaries and the ways in which such texts might affect their thinking and/or action—in the classroom or beyond it.

To explore how students respond to social justice documentaries, and which features of the films shape these responses, we conducted 11 focus groups and one interview with students (n = 32) from across disciplines at a Canadian university. In each data collection session, participants were shown clips from two documentaries (*The Cove* and *Angry Inuk*) and asked to discuss their responses to these clips, both through group discussion and by responding to a series of prompts individually, in writing. While data analysis is ongoing, we present in this paper a number of preliminary insights arising from initial examination of eight of the focus group and interview transcripts. Key ideas arising from the data include a sense that documentary films have the capacity to begin to broaden, complicate, or solidify viewers' awareness and understanding of social justice issues, and that they may prompt students to engage in further research about the topics represented. Participants also suggested several filmic features that might support these responses, including calls to "emotion" and/or "reason", the establishment of proximity between the viewer and the film's subject matter, potential bias in the presentation of information, and the power of being provided with visual evidence of injustice. Nevertheless, the data also make clear the important role of contextual features, such as viewers' pre-existing perspectives and commitments, and offer mixed indications that the classroom itself may play a significant mediating role when documentaries are viewed in formal educational contexts. Further attention to the interplay amongst these factors is thus required.

1. Introduction

Documentary films are increasingly used as a pedagogical tool (Marcus & Stoddard, 2009; Swimelar, 2013; Marquis, *forthcoming*). While such films may be deployed in a range of ways, they have particular potential to contribute to education for social justice—especially since informing and/or persuading viewers about contemporary social problems are amongst the most common foci of documentary practice (Gaines, 2007; Lewis, 2007). In line with this focus, a growing body of scholarship analyses the representational practices of social justice documentaries, unpacking such films' socio-political ramifications and their role in supporting and/or discouraging social change (e.g., Aguayo, 2013; Edwards, 2017; Marquis, 2012; Borum Chattoo & Jenkins, 2019). Much of this research, however, remains focused on analysis of documentary texts themselves. Many have therefore argued that more research exploring viewer response is needed (e.g., Nisbet & Aufderheide, 2009; Scott, 2014). This is particularly important when considering how documentaries function within postsecondary education settings. Students often interpret these films in the context of classroom discussion, which may play a role in shaping their viewing practices and their responses to the films themselves (Culloty & Brereton, 2017). More generally, given film's

potential to function as a powerful form of 'public pedagogy' (Giroux, 2008), and SoTL's focus on student learning (Felten, 2013), further attention to what and how students learn about social justice from documentary films is needed.

Against this backdrop, this study explored student responses to social justice documentaries in order to further understanding of how viewers learn from, and engage with ideas of injustice and activism presented in, documentary films. In particular, we set out to explore the following research questions:

1. What are students' responses to social justice documentaries?
    a. What elements of film motivate or demotivate particular responses?
    b. What is the role of classroom discussion in shaping student response?

2. Methodology

We took a qualitative approach to data collection, which involved focus group discussions and individually-completed responses to a series of reflective prompts. After receiving ethics clearance, we invited students from across disciplines at one Canadian university to participate in the project. Ultimately, 32 people elected to take part, and 11 focus groups of two to four participants each were held between July 2018 and January 2019. One additional session involved only one participant (since other scheduled participants did not attend), and thus proceeded as an interview.

Like other empirical work investigating viewer response to film and television texts (e.g., Click *et al.,* 2015; Huiberts & Joye, 2018; Marquis, Johnstone, & Puri, 2019), we dedicated a substantial portion of the focus group time to screening film clips, and asking participants to engage in discussion about what they noted in those clips and how these factors might shape their understanding or action related to the social justice issues represented. Clips were drawn from two documentaries (*The Cove* and *Angry Inuk*) that take up related issues, but from different perspectives and using different approaches. *The Cove* focuses on dolphin hunting in Japan, and is structured as a kind of mystery-thriller in which a team of North American activists sets out to expose the cruelty of the hunt by capturing illicit footage of it as it unfolds. *Angry Inuk*, on the other hand, takes up the effects of efforts to ban seal hunting on Inuit communities in Northern Canada. It mixes footage of community members' activist work with exposition and stories shared by filmmaker Alethea Arnaquq-Baril in order to construct a counter-narrative that speaks back, from an Inuit perspective, to the version of the hunt constructed by animal rights groups.

In each focus group, participants were shown a series of short clips from one of these films, and given a few minutes to complete brief, written responses outlining their initial reactions. They then engaged in a facilitated discussion about the film with other participants, before responding to two further individual, written prompts that asked how, if at all, the discussion influenced their thinking about the clips and the issues they represented. This process was subsequently repeated for the other film, before the session concluded with a final group discussion that explored participants' general perceptions of how documentaries participate in shaping thinking and/or action about issues of social injustice. By combining clip screening, group discussion, and individual responses in this way, we aimed to offer opportunities for participants to engage in facilitated dialogue about concrete examples, as they might in a class setting, while also providing means for them to reflect explicitly on the nature of these discussions and to privately share additional thoughts they did not want, or did not have an opportunity, to contribute to the group discussion.

Focus group recordings are currently being transcribed verbatim for analysis, with eight of the twelve transcripts completed to date. Preliminary analysis of these eight transcripts is being conducted using a brand of inductive analysis based on constant comparison (Merriam, 2009). Below, we present some preliminary insights arising from these initial analytical steps.

3. Findings

Our preliminary analysis has yielded several ideas about how documentaries might affect student thinking and action, and about the features of documentary films that influence these responses. At the same time, we have also been struck by participant comments about the role of contextual features in determining their responses, including (but not limited to) the way formal class contexts might or might not shape their viewing practices.

3.1. Promoting awareness and action

Across the data, participants suggested a range of ways in which viewing documentaries might affect their future thinking and/or action. Many noted that the clips served to shift, broaden, or solidify their thinking about the issues involved, for instance. After viewing the selections from *Angry Inuk*, one participant stated, "*for me, the preconception was that seal hunting was bad. But after seeing this clip, I think it's important to [Inuit people]. We can't just exclude them from society because they are part of this society. So we need to think why it is so important*" (FG8P1[1]). Nevertheless, many participants were reticent to draw definitive conclusions on the basis of the clips and discussion alone, instead claiming they would watch the entire documentaries, or do further research to supplement the information the films offered, before acting in any way. One participant positioned this as an obligation for documentary viewers: "*as the viewer, you have to watch a documentary and figure out your initial reaction to it, but also you have to be independent and proactive enough to go beyond and … talk to people, go do your research … make that next step*" (FG3P2).

Other common responses described by participants included recommending the documentary to others or discussing the film's topic with people they know. Speaking about *Angry Inuk*, for instance, one suggested, "*I would also probably show it to people, because I think it's totally a perspective that needs to be spread*" (FG7P2). Some also suggested that documentaries had prompted them to make individual lifestyle changes, such as becoming vegetarian or buying sustainably-produced clothing. When asked to evaluate how meaningful their potential responses to documentaries were, some critiqued their suggested courses of action as insufficient. However, most participants thought their responses were meaningful, and several indicated that small steps like sharing information or signing a petition can snowball and contribute to larger outcomes, as "*even a little bit goes a long way*" (FG3P1).

3.2. Film features

After watching the clips, participants highlighted several filmic features that stood out and shaped the responses noted above. For example, several made comments that suggested

[1] Identifiers refer to the focus group and participant number.

documentaries might be especially persuasive when they signal the relevance of the issue represented by attempting to establish points of contact between the film and the viewer. Along these lines, participants often noted a scene in *The Cove* in which the filmmakers attempt to demonstrate that dolphins' intelligence is on par with that of humans. Many of the participants noted that seeing dolphins displayed in this way generated sympathy for the animals. As one explained, "*having a species like dolphins that exists and can be as intelligent as human beings, that evokes a response*" (FG4P3).

In a related vein, participants frequently suggested that their responses to the films were shaped by whether the films took an "emotional" or a "rational" approach to making their arguments. One participant suggested, "*[The Cove] appealed more to emotions, whereas [Angry Inuk] appealed more to rationality…I have a tendency to resonate more with the emotional side."* (FG8P2). While most participants responded strongly to what they saw as emotional appeals in the films, they disagreed over which film was more emotionally effective. Some suggested they felt a stronger connection with *Angry Inuk* ("*[Angry Inuk] felt real, it felt human, and I care about this person"* (FG1P1)), while others felt more affected by *The Cove* ("*it's kind of building an emotional attachment and then [they] kind of break that emotional attachment to create a very stirring emotional response"* (FG3P2)). Despite their common emphasis on emotion, many participants also suggested they might be more persuaded by documentaries that include statistics or quantitative measures (e.g., "*I find that [Angry Inuk] didn't really supply a lot of statistics and a lot of facts, so I would definitely continue researching to figure out the whole story*" (FG3P2)).

Participants generally paid close attention to the biases that shaped each film, and often noted that the clips seemed to take a one-sided approach to the issues represented. This left some participants wary of drawing conclusions about the issues without first considering views the documentaries did not present. After viewing the clips from *The Cove*, for example, one noted that they would like to "*[find] out more of the nuances that didn't seem to really be shown in the documentary, and the perspective [of] the Japanese and the people killing the dolphins*" (FG1P3). At the same time, some participants claimed that one-sidedness in documentaries is not entirely problematic: "*bias isn't necessarily bad, it's just when bias sort of blinds you to other possible opinions, that's when ... I have a problem"* (FG5P2). In the case of *Angry Inuk*, some participants remarked that its perspective, which centres the experiences of Inuit people, made the film more effective by presenting a marginalized point of view that is frequently underrepresented. One participant suggested, "*I thought it was a good way to sort of represent Inuit culture and Inuit people in a way that may not be represented in mainstream media or in other kind of news outlet sources*" (FG2P2).

Finally, some participants attended to the ways in which documentaries might shape thinking and response by actually *showing* injustices in concrete, tangible ways, rather than simply offering abstract descriptions of them. This was often connected to the films' capacity to evoke emotion, as seen in discussions of the footage of the hunt in *The Cove*: "*once you actually see it, you have proof that it's happening, and it's just much more of a visceral kind of response that you get from that*" (FG12P1).

3.3. Context

Alongside elements of the films themselves, participants also highlighted how contextual features might affect student responses to social justice documentary. For example, echoing the idea that films signal points of contact between the audience and the topic represented, several suggested that the viewer's relative proximity to the

film's subject correlates with their desire to take action. When participants were asked whether an issue being relevant to Canada had an impact on how they connected with it, one participant said, "*I think yeah. … just knowing how geographically close it is*" (FG5P3). Considering how feelings of closeness might encompass more than just geographical proximity, another said (of *Angry Inuk*), "*I spent a lot of time sort of interacting with people from their culture. ... It's like I sort of have this personal connection to it that I feel sort of pushes me to take action on the issue*" (FG5P2).

The second quotation above also suggests how viewers' personal experiences and pre-existing views might shape their responses to documentary films. One participant explained how their awareness of the work of animal rights groups made them somewhat critical of the argument presented by *Angry Inuk*, for instance, noting, "*I was really biased, because I know the Humane Society does so much more than talking about veganism, and banning things*" (FG8P2). On the other hand, coming in with perspectives that are corroborated, rather than contradicted, by a documentary has the opposite outcome, as demonstrated by the following comment made in response to *The Cove:* "*I'm a vegetarian so ...I'm very biased when it comes to this, but like, I definitely think showing how intelligent [dolphins] are, it does help*" (FG12P1).

Temporality also plays a role in shaping viewer responses to documentaries. When asked if they felt inclined to take action after watching one of the clips, one participant asked, "*Sorry, this documentary was released in what year?*" (FG4P2). This question, like other participant comments, suggests that viewers are more likely to take action if a documentary is recent, since that could mean the issue is more urgent or that change is still possible.

3.4. Classroom viewing

While the above examples make clear how contextual factors can mediate student responses to social justice documentaries, many participants argued that viewing films in a class setting would have limited impact on their response. The following quotation is representative in this regard: "*overall, the feelings and the understanding I get from a documentary would be the same irrespective of the setting*" (FG12P3). Nevertheless, some did note that their responses might be influenced by factors like the content or focus of the class in which the documentary was presented, or the way in which the professor framed the film and the issues it takes up. Some also argued that responses offered by their peers in the course of classroom discussion might shape their understanding of the film (e.g., "*in a classroom setting, I would be more confused. Because when all the students have a chance to speak up and share their opinion, they all make sense*" (FG4P3)), or indicated that viewing in a large class could make for less productive dialogue (e.g., "*I always find that large class discussions sort of lead to ... everyone having the same opinions. ... Like, the majority of the class will have one opinion and [that] sort of suppresses people with dissenting opinions from talking*" (FG5P2)). Perhaps especially interestingly, a few participants suggested that being in a classroom might affect how actively they engage with documentaries and the ideas those films present. While one participant suggested the class context *might* make them pay closer attention (if they knew they would be assessed on issues related to the documentary, for instance), others indicated that their general experience of classroom learning as unengaging might make them less likely to think actively about the film than they were in the focus group context. As one participant put it, "*I think of a classroom, I could be thinking boring. So anything I watch in the classroom, I don't think as much when I watch it. But knowing that I have to talk about it and think about it and form an opinion [in the focus group], it's definitely more critical thinking on my part*" (FG8P2).

4. Discussion

The preliminary findings reported here point toward several interesting questions and considerations about the educative work performed by documentary films, which are worthy of further exploration. First and foremost, the data illustrate particular kinds of learning that might be facilitated by, and in response to, social justice documentaries. Participants frequently reported being exposed to new ideas and perspectives through the clips screened during the focus groups, and often expressed a motivation to continue watching the films outside of the sessions and/or to engage in further research about the issues represented. Of course, whether or not participants follow through on these intentions remains to be seen, but the commonality of these responses, along with the active and enthusiastic engagement of most participants in the focus group discussions, provide some preliminary indication that documentary can be a compelling way of encouraging student attention to and engagement with social justice issues. Further research that explores this potential in more detail (e.g., by looking at ongoing engagement beyond a preliminary focus group) and with a broader group of participants would thus be beneficial.

Moreover, the data also offer provocative insights into what features of documentary films might support such student engagement, and how these features intersect in potentially complex ways with a range of contextual factors. Like existing scholarship (Gaines, 2007; Marquis, 2012), for example, the present data make clear the persuasiveness of emotional appeals, with participants positioning emotion-inducing moments as some of the films' most noteworthy and effective components. At the same time, echoing Nichols' (2001) argument that documentaries can call on demonstrative, as well as affective (and ethical), appeals to persuade their audiences, so too did participants express an interest in statistics and contextual information about the issues, or a desire for these when they were seen as lacking (see also Borum Chattoo & Jenkins, 2019). The attention many participants paid to the effects of *actually seeing*, rather than simply being told about, events like *The Cove*'s dolphin hunt likewise resonates with scholarship that suggests a primary impetus of documentary filmmaking is to record or reveal elements of the social world, highlighting the perceived evidentiary power of the filmic image (Renov, 1993; Gaines, 2007). Interestingly, however, participants attended to these different appeals with varied frequency and emphasis, demonstrating a range of response not always acknowledged meaningfully in text-focused research. At the same time, they also noted additional filmic (e.g., the creation of a sense of closeness to the topic; potential textual bias) and contextual features (e.g., their pre-existing views; their physical, conceptual, and temporal proximity to the issues represented; the influence of the classroom) that might further mediate their responses. The interplay of these textual and contextual features, which has not yet received extensive attention from documentary scholars, is thus an important focus for our analysis going forward.

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Problem-based Learning in Higher Education Service Learning: Implications for Theory-Practice-Transfer

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Abstract

This Scholarship of Teaching and Learning (SoTL) project deals with the problem-based learning process of students in an undergraduate service learning course at a German University of Applied Sciences. Based on a lean design thinking cycle (observation-ideation-implementation; cf. Ries, 2011) and the continuous reflection on their learning experiences, students in this course learn to implement a crowdfunding project for social enterprises. As previous research has shown, the didactic concept of service learning in this course initiates problem-based learning at different levels. This will be done through the following aspects: (a) a deep understanding and exploration of a topic in their field of training (here, financing of social enterprises), (b) the promotion of both entrepreneurial as well as intra- and interpersonal communication and team skills, (c) community engagement and social responsibility in challenging fields of society, while applying theories, concepts and methods to practice, and (d) the preparation for a job in child and youth work at the bachelor level (EQR level 6). The project includes open observations of the self and others, collection of interview data to describe students' perception of a problem, contracting, structuring their learning process, decision-making, communication, conflict and problem-solving skills, and team development. The SoTL project is based on concepts and approaches of 'management education and learning' regarding the special role of problem-based learning in service learning scenarios (e.g. Brownell & Jameson, 2004; Csapó & Funke, 2017; Guo *et al.*, 2016; Kolenko, Porter, & Wheatley, 1996). This talk not only presents initial findings of the qualitative-empirical social research process accompanying the crowdfunding course, but also leads a discussion and reflection of sustainable frameworks for good teaching practices, management didactics in higher education and the achievement of teaching and learning goals of service learning at the level of the learner, study program and university (micro, meso and macro levels). Following the impulse contribution, there will be an exchange with the participants on the use of service learning in university didactics, the development of quality in teaching, best practices and future research needs.

Keywords: service learning, problem-based learning, crowdfunding, lean thinking.

1. Introduction

This Scholarship of Teaching and Learning (SoTL) project deals with the problem-based learning process of students in an undergraduate service learning course at a German University of Applied Sciences. Based on a lean design thinking cycle (observation-ideation-implementation; cf. Ries, 2011) and the continuous reflection on their learning experiences, students in this course learn to implement a crowdfunding project for social enterprises. Furthermore, the SoTL project is based on concepts and approaches to 'management education and learning' with regard to the special role of problem-based learning in service learning scenarios (e.g. Brownell & Jameson, 2004; Csapó & Funke, 2017; Guo, Yao, Wang, Yan, & Zong, 2016; Kolenko, Porter, & Wheatley, 1996).

This paper sets out an initial overview of the results of a comprehensive literature review, introduces the qualitative-empirical research process accompanying the crowdfunding course (e.g. open observations of oneself and others, collection of interview

data to describe students' perception of a problem, contracting, structuring of their learning process, decision-making, communication, conflict and problem-solving skills, and team development). Eventually, the paper leads to a discussion and reflection of sustainable frameworks for good teaching practices, management didactics in higher education and the achievement of teaching and learning goals for service learning at the level of the learner, study program and university (micro, meso and macro level).

2. Literature Review

In recent years, scholarship of teaching and learning (SoTL) as an avenue of inquiry in student learning and teaching practices has become critical, not only in German-speaking countries. Relevant terminological classifications and overviews, concepts and methodological approaches used in this context have already been presented elsewhere (cf. Cerbin, 2018; Huber, 2011, 2014). In addition, 'self-study teacher research' (Huber, 2014, p. 31) should provide information on the development and impact of learning, didactic methods, and teaching concepts in higher education in addition to classical teaching and study evaluation (e.g., Hutching & Shulman, 1999; Martin 2007). SoTL is widely regarded as a systematic and methodologically-supported reflection of one's own teaching and aims for a publication of the insights and findings gained in this kind of research to a wider public, in order to stimulate further exchange between teaching staff (Huber, 2014, p. 21). Significantly, SoTL has meanwhile become part of scientific discourse. The study presented here is based on the Management Learning and Education (MEaL) paradigm and refers, in part, to the author's publications aiming at the development of subject-specific knowledge (Arnold, 2019a, 2019b, 2019c), the reflection of theory-practice transfer in 'social work management education' (Arnold, 2019d), and the development of action-oriented didactics in the context of e-learning tutor education programmes (Arnold & Koch, 2013). In the following, we present an overview of three interwoven aspects: (i) problem-based learning, (ii) service learning, and (iii) crowdfunding.

(i) *Problem-solving ability* is considered one of the key competences for the 21st century. The term stands for a summary of a variety of domain-specific competencies, including the ability to solve analytical and complex problems (Csapó & Funke, 2017). The effectiveness of problem-based learning to achieve behavioural learning outcomes has so far been studied in academic didactics with regard to the development of critical judgment and student involvement (e.g. Muehlenkamp, Weiss, & Hansen, 2015). In particular, the acquisition of new professional knowledge, reflexive skills, social and self-competence, team and communication skills as outcomes of service learning, under further consideration of learners' behaviour in the classroom, was also analysed. Research findings suggest that teachers would increase engagement in the classroom if they provided exercises that help students to 'think about their experiences, develop a deeper understanding of the surrounding world, and connect what they have learned in the classroom with real life' (Guo *et al.*, 2016, p. 16; see also Peterson, 1997, 2004). Additionally, the development and promotion of problem-solving abilities as well as problem-based learning is more or less an integral part of service learning, because, in addition to their cognitive and affective competence development, students should also be able to develop solutions from different perspectives based on real problems from professional practice and make decisions in complex and ethically-challenging (dilemmatic) situations (e.g. Connor-Greene, 2002). This includes implementing and evaluating previously developed project plans, team leadership and conflict resolution, convincing others, and communicating on a variety of levels (Brownell & Jameson, 2004). The evaluation of the achievement of the problem-solving learning objective requires certain

types of examinations (Csapó & Funke, 2017), e.g. learning portfolios, (single and/or group) presentations, essays, diaries, and randomised quizzes differentiated according to different learning levels (e.g. Muelenkamp *et al.*, 2015). Learning journals and learning portfolios are especially well-suited to stimulate reflection, but their evaluation can only be as good as the evaluation criteria (e.g. learning process, achievement of defined learning outcomes) have been precisely elaborated (Rosegrant-Alvarez & Moxley, 2004). Translations of qualitative data are at risk of random assessments, variable interpretations, and complaints from students.

(ii) *Service learning* is a teaching method that promotes the social commitment of learners in connection with the acquisition of new professional knowledge, methodological, and self-competences in and outside the classroom. Service learning was, so far, subject to research with regard to the promotion of entrepreneurial learning (Howorth, Smith, & Parkinson, 2012), analysis of and reflection on ethical questions (Kenworthy-U'Ren, 2008; Kenworthy-U'Ren & Peterson 2005; Weber 2006), development of problem-based learning in the context of projects of pupils, trainees and students (Brownell & Jameson, 2004; Mullins & Miller, 2009), integration of learning technologies in service learning (Jia, Jung, & Ottenbreit-Leftwich, 2018), development of best practices (Kenworthy & Fornaciari, 2010) and its impact on social, individual and cognitive learning outcomes (Madsen & Turnbull, 2006; Yorio & Ye, 2012).

Service learning has been found to have a profound impact on the personal, social, and cognitive aspects of learning, expanding the pedagogic reach into the community (Bernadowski, Perry, & Del Greco, 2013). In order to understand both its impact and how to cultivate an education culture in alignment with it, Yorio and Ye (2012) performed an extensive meta-analysis. This study expounded on the value of the personal insight that service learning cultivates, improving students' cognitive capacity to objectively put themselves into a wider context (Yorio & Ye, 2012). The authors found that 'service-learning provides students with a type of *reality* and *reciprocity* experience, allowing them to develop a deeper understanding of social issues. The elements of *reflection* and *reality* align with and enhance the outcome of personal insight' (Yorio & Ye, 2012, p. 11). Service learning was also found to improve students' grasp on the complexity of social issues by exposing them to a variety of community contexts which have the power to expand both empathy and critical thought (Yorio & Ye, 2012).

Due to the power that service learning has to expand an individual's cultural competence through exposure and expansive learning opportunities (Bringle & Clayton, 2012; Chen, McAdams-Jones, Tay, & Packer, 2012), pedagogic advocates are making the case that service learning should be a key component of all teacher education (Chambers & Lavery, 2012). In this context, cultural competence is regarded as one of the key elements challenging educators today, due to the many calls to internationalise higher education and study abroad programmes, and to expand extensive community service networks in order to sensitise for diversity. However, researchers warn, 'our relationships with institutions, organisations, communities, and people in international service-learning contexts can both disrupt and reproduce inequitable power dynamics and historical global relations' (Crabtree, 2013, p. 25). Thus, service learning ensures that students will develop cultural competence and helps to prevent a reproduction of the intertwined powerful dynamics that undermine the evolution of equality and diversity (Bringle & Clayton, 2012).

One aspect in which service learning modalities are being applied is in addressing sustainable consumption patterns (Barth, Adomßent, Fischer, Richter, & Rieckmann, 2014). Merging service learning perspectives with incidental learning in project-based seminars,

Barth *et al.* (2014) study the power of this method to expose and improve consumption patterns. They also integrate a concept of 'transdisciplinary collaboration' (Lang *et al.,* 2012) into service learning:

> In such an approach, students and practitioners are equal partners in the process of planning, decision-making and acting. 'Solutions' are not developed in the university and brought to a community as a service. Rather the whole process of problem definition, project planning and project management is the subject of deliberation processes between all of the parties involved in a transdisciplinary learning process. (Barth *et al.,* 2014, p. 75)
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> The merging of service learning with policy that supports social justice is community engagement taken to the next level and has the power to show students what ethical organisation looks like. (Barth *et al.,* 2014)

A key way in which service learning empowers both educators and students is through its power to address how federal policies undermine educators' autonomy (Kelly, 2013; Stenhouse & Jarrett, 2012). The policies rooted in standardisation have proven to freeze the creative capacity of teachers to develop students' employable and project management skills and to prepare them for the job market. Service learning is one of these approaches, as it empowers activism, engagement, and participation, which holds students accountable for how their choices impact society at large, and asks teachers to demonstrate and reflect on 'reality' rather than only to talk about it (Kelly, 2013; Stenhouse & Jarrett, 2012). Thus, the implementation of a service learning project in the final years of a bachelor's program, on the one hand, is helpful in enabling 'project-based learning' (e.g. Kokotsaki, Menzies, & Wiggins, 2016), and, on the other hand, represents a valuable preparation for their professional life as future social pedagogues, because it is characterised by individual, group, and project work.

Based on these findings, the didactic concept of service learning helps to initiate problem-based learning at different levels, through (a) a *deep understanding and exploration of a topic in their field of education* (here, financing of social enterprises); (b) the *promotion of both entrepreneurial as well as intra- and interpersonal communication and team skills*; (c) *sensitising for cultural competence, community engagement, and social responsibility* in challenging fields of society, while applying theories, concepts and methods to practice (here, identifying alternative ways of financing the welfare-mix in the social economy); (d) *promoting transdisciplinary collaboration* and ethical reflection; and (e) the *enhancement of employable skills* for prospective professionals in the field of child and youth work (EQR level 6).

(iii) Crowdfunding—as an alternative source for raising financial resources from a large number of capital providers or donors ('the crowd') for various types of projects, companies and initiatives—has been discussed significantly in scientific research since 2010. At this time, estimates of the crowdfunding market already ranged from $3 billion to $5 billion per year (Deloitte, 2013). Originally understood as a way for funding financial gaps in the early phases of a company's life cycle, crowdfunding quickly became a tool to finance artists from different sectors (e.g. Agrawal, Catalini & Goldfarb, 2011). The typology of the donation-, reward-crowdfunding, lending- and equity-based crowd investing is prevalent in scientific literature since its early stages (Beck, 2012, p. 15; Best, 2013; Massolution, 2013). So far, empirical studies have made use of qualitative and quantitative methods, first analysing market data linked with interviewers and later, after platforms established themselves, as a data provider for surveys as well (e.g. Mollick, 2014). Those studies were interested in the quality and strength of personal social networks, campaigns and their impact on the success of a project. Current research has rarely considered civic crowdfunding, such as government,

public and non-profit institutions and communities themselves: 'In academic literature to date, there has been no consideration of civic or community-oriented projects (*civic crowdfunding*) as a distinct subgenre of activity, let alone one that faces unique challenges and questions' (Davies, 2014, p. 19). So far, attention has been paid to the engagement of offline communities online and the potential to contribute to the production and consumption of local public goods (Charbit & Desmoulins, 2017; Stiver *et al.*, 2015).

3. Methodology

Given the fact that service learning is an under-researched area in both German social work and social management literature, I adopted an exploratory qualitative approach, which is well suited to the interpretative paradigm. The research follows the methodological principles based on a hermeneutics of symbolic action theory and cultural psychology (Straub, 2006). This approach is, in some important respects, supported by the so-called documentary interpretation (Bohnsack, 2007) and comparative analysis (Glaser & Strauss, 1967).

3.1. Data Collection

Focus group discussions. The written material is the result of focus group discussion with students in the course (Krueger & Casey, 2015). They were transcribed verbatim and are here presented in a translation from the written German. The interviewer strictly adhered to the methodological principles of openness, being a stranger, and communication, thus the way the discussion is thematically structured, and how it is told linguistically, represents the speakers' own sense of significance to a high degree, as well as their expressive abilities.

The CIT method. Additionally, data were collected using the critical incident technique (CIT). The CIT was originally developed in psychology (Flanagan, 1954) and widely used in health and social care in a variety of ways to facilitate the integration of theory and practice:

> In the area of social work, the CIT has been mostly used as a tool for teaching and learning rather than as a research method, though it is recognised as a qualitative method of data collection […] Due to its retrospective nature, the CIT technique is a valuable reflective tool for enabling social work students to recall learning experiences using their own words, thus helping them to learn from practice. (Papouli, 2016, p. 59)

Critical incidents are short, mostly spontaneous and unplanned narratives about past or current events and experiences or observations that can have positive or negative attributions and which 'mark significant turning points or change in the life of a person or an institution or in some social phenomenon' (Green Lister & Crisp, 2007, p. 24). In this study, critical incidents were collected from students with a semi-structured questionnaire developed by Papouli (2016) and translated into German which consists of only of two sections: (A) General Instruction and Key Questions Related to the Critical Incident; (B) Additional Questions about the Critical Incident.

Participatory observation. In order to understand the context of the field of research—in this case, students' engagement in the classroom, interaction with stakeholders and the decision and problem-solving processes—methods of participatory observation were utilised. It also helped to familiarise us with the conditions of the research field (Przyborski &

Wohlrab-Sahr, 2014, p. 40) and to take corresponding field notes in the form of observation protocols.

Document analysis. The document analysis conducted in this project is based on the assumption that documents can be understood as 'objectified culture' and 'clotted marks or external stores of knowledge', as opposed to 'subjective culture', such as opinions, cognitions and evaluations (Popp-Baier, 1998, pp. 118f.; see also Mannheim, 1970, p. 75). This analysis attempts to establish a connection between objectified documents and subjective representations of social reality, as manifested in biographical or organisational narratives of the interviewees or in observations. The collection of relevant documents during the service learning project took place according to their relevance to the participants and with regard to 'theoretical sampling' (Glaser & Strauss, 1967). Preliminary results of the document analysis served, on the one hand, to prepare the focus group discussion and participatory observation and helped, on the other hand, to condense the categories, codes and research perspectives found in the empirical material.

3.2. Sample

The project involved social work students at the end of their studies who have completed an undergraduate service learning course at a German University of Applied Sciences in the summer semester of 2019. The final sample consisted of 11 students. Among the students, seven students were female and four were male; their ages ranged from approximately 21 to 35 years. Participants were selected due to a purposive sampling strategy, while selection was based on characteristics of the population (e.g. maximum variation and heterogeneity) and the objectives of the study (Palys 2008). This was a pragmatic decision, as this sampling strategy does not involve additional costs (as this study was self-funded), while it provided a good theoretical representation of students' participation in service learning courses in social work study programs. All participates signed an informed consent document which stated that their participation would be voluntary, all data gathered had to be anonymised and that exit from this study was possible at any time and would not lead to any disadvantages. Students acted in different roles and on different teams in the project, e.g. public relations, crowdfunding platform management, project management, or visual data gathering. Their task was to organise a crowdfunding campaign in a rural district near the university city in Germany to support a youth group (ages 12 to 18 years) to fund a youth club for the first year.

3.3. Data Analysis

All data collected was transcribed verbatim and analysed for very different purposes (Deppermann & Lucius-Hoene, 2004), including the explanation and analysis of the meanings participants ascribed to their actions, experiences, cognitions, self-thematisations, and evaluations during the project. Particular attention was paid to a variety of types of human activities (and on possible internal sub-differentiations of those types). The result of this analysis is part of the research tradition that deals with narratives, a tradition influenced by symbolic action theory and cultural psychology (Straub, 2006). Of particular interest were the ways in which students understand and explore the topic of crowdfunding of social enterprises, how they made use of intra- and interpersonal communication and team skills, how they engaged in the community and took social responsibility in challenging fields of society, while applying theories, concepts and methods to practice, and how this service learning course might prepare them for a prospective job in child and youth work.

4. Preliminary Findings

While research is still in progress, the following preliminary findings could be presented as a result of the analysis of the focus group discussion, participatory observation, and document analysis (Table 1).

Table 1
Summary of codes [author's own illustration]

Codes	Summary and Description
(a) Participation in previous projects	Voluntary ecological year
	Internship
	Project as student assistant
(b) Prior knowledge and experiences	Prior knowledge is linked to type, scope and number of stakeholders of the project
	Theoretical knowledge about the project's implementation
	Objectives, assignment and framework must be clear before start of project
	Prior project experiences are helpful
(c) Individual learning experiences in previous projects	Motivational effects of projects: Hands-on experience, experimenting with new things, exchange with others, travelling; motivation decreases with length of project
	Project at start of study program enables reflection, theoretical learning (Transfer from practice to theory)
	Facilitation of learning from practice: Processes, making use of finances, exchange with participants, networking, (social) management
	Suitable projects are resources while studying for theory-practice-transfer, practical experiences are better the fictional cases in class
	Project experiences need to be theoretically penetrated and reflective
(d) Assumptions about project-based learning	Learning from failure (trial and error-learning) is part of project, motivates and broadens horizon
	Self-reflection, experiences of self-efficacy and self-affirmation are part of projects
	Collaborative learning facilitates learning about behaviour of other people and development of new projects
	Learning is situated on different levels: e.g. individuum, group, organisation (micro, meso, macro levels)
	Aims and conditions of successful projects: Projects need to be predictable, terminated and participants need to be accessible
	Projects help to acquire transferable skills: e.g. presentation of results to others, improvisation talent, responsibility, trust, latitude for (entrepreneurial) decisions, openness, attitude for continuous learning, flexibility
(e) Support in learning process	Support during projects: learning on-the-job; step-by-step inputs, mentoring depending on learning needs and level of experiences
(f) Learning objectives for the future	Projects are part of lifelong learning: no two projects are alike
	Practical knowledge contains practical experiences in principle, processes and structures, phases, components of project, funding, topics
	Evaluation of effect of projects are necessary for continuous learning

Codes identified during sequential analysis of transcripts, documents, and field notes were synthesised from participants' first-hand experiences (so-called in-vivo coding) as well as via theoretical coding (Glaser & Strauss, 1967). Codes were grouped to main categories that emerged from the analysis of the different meanings of their actions, experiences, cognitions, self-thematisations, and evaluations during the project, and sub-categories were developed to highlight their internal differentiations accordingly. Results include the five main categories: (a) Participation in previous projects, (b) Prior knowledge and experiences, (c) Individual learning experiences in previous projects, (d) Assumptions about project-based learning, (e) Support in the learning process, and (f) Learning objectives for the future.

5. Discussion and Conclusions

The conference presentation will not only reveal these initial findings of the qualitative-empirical social research process accompanying the crowdfunding course, but also lead to a discussion and reflection of sustainable frameworks for good teaching practices, management didactics in higher education and the achievement of teaching and learning goals of service learning at the level of the learner, study program and university (micro, meso, macro levels). Following the impulse contribution, there will be an exchange with the participants on the use of service learning in university didactics, the development of quality in teaching, best practices and future research needs.

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Teaching outward and connecting inward: innovative professional development programme to connect the curriculum with the SDGs

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Abstract

The reorienting of higher education curricula to directly link to the sustainable development goals is an important task confronting higher education teaching and learning staff. There is greater expectation on graduates to fulfil a citizenship role and play their part in addressing society's greatest challenges. We are challenged as educators to reflect that responsibility in how we organize our courses and support student learning. One mechanism is through engaging students in community-based learning (CBL). Thoughtful design of experiential learning with community partners can provide exactly the conditions to support students gain these skills and insights. Do staff feel equipped to integrate this approach to learning in their courses and how do institutions grow capacity to ensure community partnerships are high quality and based on reciprocity? University College Cork (Ireland) has developed an innovative professional development programme for staff that incorporates theoretical underpinnings, key skill development and immersive, experiential learning in a community setting. The design of the programme was informed by a scoping of international best practice and key literature. This paper will share the key findings from this piece of research.

1. Introduction

In the current higher education environment one does not need to look far for evidence of a growing rationale and interest in connecting curriculum design to acute societal challenges. The rise and hold of developments such as the *United Nation's Sustainable Development Goals* and *Responsible Research and Innovation* (RRI) have contributed to a culture where there is an expectation on higher education offerings to equip students with the knowledge, skills and attitudes to connect with pressing societal issues. More recently, initiatives such as the *Times Higher Education Impact Rankings 2019 by SDG* provide the opportunity for higher education institutions to consider how their activities align to the SDGs and to be recognised for their efforts to support the goals. The combination of policy and cultural levers have primed the higher education sector to develop and reorient curricula to connect with societally important themes in a sustainable and embedded way (Tassone *et al.*, 2017).

Despite these developments, educators at third level are remain significantly unsupported in building their knowledge, skills and capacity with regard to how to connect their teaching to the SDGs and RRI for the overall enhancement of student learning (O'Mahony *et al.*, 2018). The literature talks about a particular innate 'disposition' (Calderwood *et al.*, 2017; Nelson 2015; Blanchard *et al.*, 2009) that some teaching staff or faculty typically have for intrinsically linking the core theories of their disciplines to real-world challenges and opportunities, and emphasising to their students the relevance of this. While there will always, arguably, be a cohort of teaching staff with an innate understanding

of why and how curriculum should be linked to sustainable development goals (or the future equivalent), this cohort, as well as educators who may be uncomfortable with this teaching approach, equally require knowledge, skills, and resources to build their confidence and capacity.

One means for connecting students to societal issues is to integrate disciplinary and classroom learning with the work of community-based organisations. Creating bespoke, authentic community-based learning scenarios can offer students the opportunity to see their discipline in a live, applied context. Community-based learning is defined as '"a form of experiential education in which students engage in activities that address human and community needs as part of structured opportunities, intentionally designed to promote student learning and development" (Flecky, 2011). It is credited for its benefits in advancing student skills, personal growth, confidence, and citizenship (Celio *et al.*, 2011; Essen *et al.*, 2005). For students, the areas of competence addressed extend beyond the academic realm to include leadership, communication, and organisational skills (Carver, 1997: 143). Participation in programmes with a CBL orientation immerses students in new and sometimes complex social contexts allowing students to grapple with diversity, equality and inclusivity concepts all of which more effectively prepares them for the workplace. Furthermore, advocates of community engagement approaches in HE believe that CBL should push students to the edges of their understanding of society and the people with whom they are interacting (O'Grady, 2014).

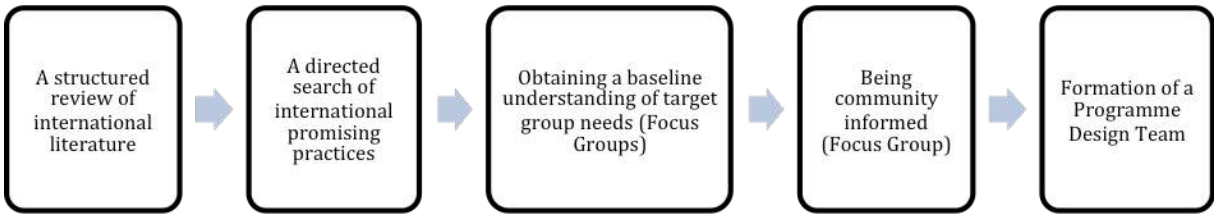
Although CBL and similar approaches are considered to be considerably time consuming for academic staff (French *et al.*, 2013), Cutforth (2014) argues that faculty can combine community engagement with their discipline and as result can foster more engaged and motivated students who have a better grasp of the applications of their disciplines, which can have a knock-on implication for student retention. For Cutforth (2014), the opportunities provided by community based learning helped him to maintain his love and connection to his discipline and supported him to stimulate a similar sense of purpose in his students:

> Through teaching the class, I experienced first-hand the impact of community-based teaching and research not only on my students but also on the community…CBRL allowed me to align my beliefs about the importance of engaging with communities with the expectations of higher education. In other words, it was the ideal venue in which to integrate the traditional domains of research, teaching, and service into community-engaged scholarship. (Cutforth, 2014: 20)

It is with this focus in mind, that University College Cork (Ireland) has designed a new staff development programme in community-based learning. The aim of the programme is to build staff capacity in the area of community-based learning so that educators can provide their students with authentic CBL experiences in conjunction with their community partner. To establish demand and a rationale for the programme, a focused piece of research was carried out.

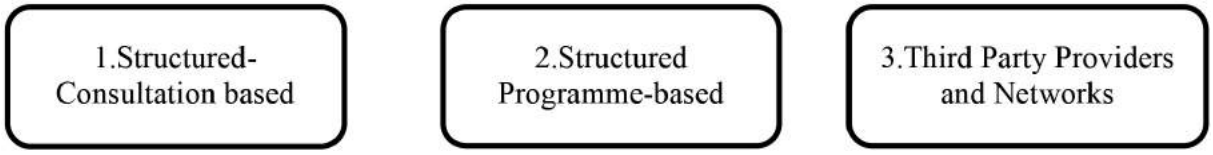
A specific project outline was adopted to inform the development of the professional staff development offering (Fig. 1):

Figure 1
Project Outline



A review of the literature indicated that existing CBL professional staff development approaches typically fall into three broad categories (Fig. 2):

Figure 2
Three broad categories of CBL Staff Development Approaches



Approaches 1 and 2 are most common in the USA. In Europe, the UK in particular, the sparse examples that were found fell into the third party training category. The approaches of a more structured and long term nature are the ones that appear to have the most impact and sustained change (French *et al.*, 2013). In following up with former participants of community engaged faculty development programmes, Gelmon *et al.* (2013) found that more than 50% of participants had introduced CBL into their teaching programmes. Participating on a structured, longer term duration CBL programme facilitated these individuals to integrate authentic CBL approaches with community partners, thereby securing more sustainable and embedded CBL opportunities for students.

Following the scoping of international literature and best practice, the researcher sought to, through the use of focus groups, understand the perspectives of staff and local community organisations with regard to demand for CBL capacity building.

2. Methodology

The purpose of this research was to obtain a baseline understanding of the target groups. This was done through a focus group methodology. Four focus groups with 3 target audiences were conducted as illustrated in Fig. 3:

A thematic analysis approach was adopted to synthetize the focus group data and several thematic categories were established to best represent the experiences and opinions of focus group participants. The following section presents these findings alongside key findings identified in the literature and best practice review.

Figure 3
Focus Group Breakdowm

3. Results and Discussion

3.1. Demand for Capacity Building in Community-based Learning

The focus group findings irrefutably showcased an interest and demand for capacity building and investment in CBL for university staff. Across both the staff focus groups and the community focus group, there was complete consensus that a CBL educational offering and its subsequent outputs is valuable and needed in the university. For example:

> There are huge challenges associated with work like this but it is so rewarding to see the impact of this work and the learning experience that students get. (Staff Focus Group Participant)

The focus group findings indicated that staff do not feel adequately equipped to integrate CBL into their courses and need support. Support is required to navigate arising, complex challenges that may occur when working with community partners and to ensure that university-community collaborations are high quality and based on reciprocity.

There was also a genuine desire for any proposed CBL staff development offering and the subsequent CBL course outputs to contribute to social change and to make a real difference. Respondents were eager for the programme to be designed thoughtfully and to be the vehicle to allow fruitful, sustainable and productive community-university partnerships to evolve:

> "Let's use this to address gaps and our problems together. Let's not just work together for the experience but let's actually look at the issues and try to work on solving those together".

3.2. Programme Content and Theoretical Underpinning

In the staff focus groups, with regard to developing a professional staff development offering in CBL, participants indicated that elements such as: a strong theoretical

underpinning; engaged research and learning principles; key theorists; reflective practice; mentorship; engaged scholarship are important to them.

> "There needs to be a theoretical base; I would like people to be looking at core issues such as equality or inclusiveness. So if you have a community who want to go out protesting against refugees in their area then we need to have a position on that. I believe we need to have an underlying set of not just ethics but some sort of philosophy." (Staff Focus Group Participant)

The focus group findings are supportive of the key themes to emerge from the literature. Specifically, community-based learning has been criticised for its lack of real impact, and focus on inequalities and social justice (Ashworth and Bourelle, 2014). There seems to be wide recognition of this potential caveat and consequently a determination to ensure that community engagement activities are not shallow and ineffective. This purposeful move away from 'feel good' service learning is evidenced in many leading staff development offerings (USA) which are emphasising social justice, principles of community engagement, and cultural competency as core elements (Welch and Plaxton-Moore, 2017).

Staff and community respondents also had particular needs with regard to what educational and practical elements the professional programme should include. Participants acknowledged the need for trust building and reflective practice both with community partners but also among the academic staff participating on the programme: "*the training provided on this programme needs to demonstrate to participants the time it actually takes to build strong partnerships and to do this type of work well*". Time and space to build trust and to reflect on what they are experiencing and what they propose to do with prospective partners was seen as crucial in supporting any meaningful changes to their teaching approaches.

Of particular importance to reorientating the curricula to directly link to the SDGs is the topic of interdisciplinarity. There was a clear desire for any proposed CBL educational offering to have a strong emphasis on inter-disciplinary interactions as without this the ability to think about and begin to work towards addressing the SDGs would be acutely undermined and even futile. For example:

> "Even today, meeting all these people and seeing that we are all ultimately fighting the same things and have similar experiences, imagine a programme where there are multiple projects going on in different disciplines, we could learn so much from each other." (Community Focus Group Participant)

As a result of this inter-disciplinary and multi-sectoral lens, staff and community educators would be better equipped to provide their students with a CBL experience that reflects the wide range of considerations and decision making processes necessary to begin to address the SDGs.

3.3. Building Capacity for Integrating CBL into Teaching Approaches

A key finding to emerge from the focus group discussions was the role that community-based organisations could potentially play in the design and delivery of the proposed staff development offering. There was a unanimous belief among teaching staff that the proposed educational offering should be experiential in nature and be integrally linked to community activities:

> "This needs to be experienced rather than taught. There's no point sitting in a classroom setting being taught that relationships take time, you won't get it until you do it. It needs to be engaging because if you don't experience it for yourself how can you expect any of your students to do it." (Staff Focus Group Respondent)

Without such an approach, staff believed they would not be sufficiently equipped or confident to trial or embed CBL in their modules and programmes. The focus group respondent quoted above draws on their experience with regard to what skillsets and knowledge staff need to develop quality CBL initiatives with community partners and subsequently create memorable CBL interactions for students. Staff see an integral link between acquiring particular skillsets and the necessity for programme components to be community driven/based.

4. Reflections and Conclusion

To grow staff capacity and confidence to effectively embed core issues rooted in the SDGs, the evidence gathered in this piece of research clearly outlines the demand for an educational offering that can both offer the theoretical underpinning or rationale for this type of work and, importantly, the tacit skillsets required to engage in high quality communication collaboration initiatives. The empirical research undertaken, supported by a review of the literature and best practice examples internationally, resulted in the development of several guiding principles to underpin the development of a professional development programme in community-based learning. These principles for the design of the programme are as follows:

— Learn Experientially.
— Community-immersed and informed.
— Strongly underpinned by a social justice orientation.
— Inter-disciplinary and inter-sectoral.

Additionally, for the programme to be effective and to create impactful change within the institution, a comprehensive and considered range of supports and resources should be offered, as well as carefully cultivating a scholarly activity in Civic Engagement. A capacity building programme on its own will not be sufficient to meet the wide range of staff demands and needs. The proposed programme, therefore, will need to be part of a wider offering; a suite of seminars, workshops, training opportunities as well as opportunities to develop thematic communities of practice. In this way, the university can be confident that it is supporting staff and community organisations who have different levels of interest, confidence and capacity with regard to engaging in CBL and related activities at particular points in time.

Following this piece of research, a 30 credit programme was developed comprising of two 15 credit modules. Module one will explore the Values, Principles and Methods of Community-based Learning and the second module will emphasise the Practice-based Approaches of Community-based Learning. The programme is now going through an internal university approval process.

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Aprendizaje basado en Juegos de rol: una aplicación a la economía del cambio climático[1]

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Abstract

This paper presents a learning experience on the economics of climate change through a role game. The objective is to improve the knowledge of the students about climate change and its consequences, as well as the understanding of mitigation policies and strategies of the different countries. Two tests have been designed involving questions related to climate change that all teaching groups that participate in the learning experience answer. In order to evaluate the effect of the role game on achieving the learning objectives, the role game is carried out just in some of the teaching groups before the second test.

Resumen

Este trabajo presenta una experiencia de aprendizaje sobre economía del cambio climático a través de un juego de rol. Con ello se pretende mejorar el conocimiento del alumnado sobre el cambio climático y sus consecuencias, así como la comprensión de las políticas y estrategias de mitigación de los diferentes países. Se han preparado dos test sobre cuestiones relacionadas con el cambio climático que todos los grupos docentes que participan en la experiencia de aprendizaje realizan. Para evaluar el efecto del juego de rol sobre la consecución de los objetivos de aprendizaje, éste se lleva a cabo sólo en alguno de los grupos docentes antes de la realización del segundo test.

1. Introducción

Hacer frente al cambio climático provocado por un incremento de la concentración de los Gases de Efecto Invernadero (GEI) en la atmósfera constituye uno de los retos globales más apremiantes de este siglo. El cambio climático se caracteriza por una complejidad y una interdisciplinariedad que aconseja elaborar una propuesta didáctica que ayude al alumnado a desarrollar una mejor comprensión del problema. Existe evidencia científica sobre la nece-

[1] Los resultados que se presentan en este trabajo han sido obtenidos en el marco de un Proyecto de Innovación Educativa (PIE-HBT Cod. 36 2018/2019) financiado por el Vicerrectorado de Innovación, Compromiso Social y Acción Cultural de la Universidad del País Vasco (UPV/EHU). En el proyecto participan, además de las autoras del trabajo, Alberto Ansuategi y Jose Manuel Chamorro (investigadores de la UPV/EHU); Ibon Galarraga y Mikel González-Eguino (investigadores del Basque Centre for Climate Change, BC3) y Josu Lucas (profesor en un Instituto de Educación Secundaria).

sidad y la efectividad del uso de juegos de rol para mejorar el proceso de enseñanza y aprendizaje sobre el cambio climático (Sterman *et al.*, 2015; Meya y Eisenack 2018).

La propuesta que aquí se presenta busca mejorar el conocimiento del alumnado sobre las causas, mecanismos, consecuencias y posibles respuestas al cambio climático. Para ello, hemos diseñado una experiencia de aprendizaje basada en el juego de rol: "El Juego de la Negociación Climática Internacional" (Lucas, Escapa y González-Eguino, 2015). Este juego se plantea como símil de las cumbres de la Convención Marco para el Cambio Climático de la Organización de Naciones Unidas, donde los países negocian la reducción de emisiones de los GEI. A través del juego, cada participante asume el rol de representante institucional de un país y vive, en primera persona, los pormenores de una negociación internacional sobre cambio climático.

Los objetivos de esta propuesta de aprendizaje son tres: (i) mejorar el conocimiento del alumnado sobre el cambio climático; (ii) mejorar su comprensión de las políticas y estrategias de mitigación de los diferentes países; y (iii) conseguir que el alumnado identifique las principales causas del éxito y el fracaso en acuerdos internacionales de protección ambiental.

Para analizar el grado de consecución de los objetivos planteados en esta experiencia de aprendizaje, hemos elaborado dos pruebas con 10 preguntas tipo test, a las que denominamos pre-test y post-test. Estas pruebas tratan de evaluar el conocimiento de los estudiantes sobre cambio climático. En el caso del pre-test, se trata de preguntas generales sobre los principales aspectos científicos y socioeconómicos del cambio climático. En el caso del post-test, las preguntas tratan de evaluar el conocimiento del alumnado sobre las causas, mecanismos, consecuencias y posibles respuestas al cambio climático, con un énfasis particular en la identificación de los elementos clave para el éxito de las negociaciones internacionales en política climática.

Se han seleccionado 4 grupos docentes pertenecientes a diferentes grados, con más de 100 participantes en total. En los 4 grupos se pasa tanto el pre-test como el post-test pero sólo en 2 de ellos se lleva a cabo el juego de rol antes del post-test. Comparando los resultados del pre-test y post-test en todos los grupos podremos analizar si el juego de rol tiene algún efecto en el aprendizaje.

Hemos preparado un material para explicar e introducir los principales conceptos sobre economía del cambio climático en los grupos donde se va a realizar el juego de rol. Además, inicialmente hemos utilizado una versión simplificada del Juego de la Negociación Climática utilizando una sola ronda de negociaciones en lugar de las 2 que presenta el juego original.

El resto del trabajo se estructura de la siguiente manera. En la sección 2 se describen las principales características de los grupos docentes seleccionados. En la sección 3 se describe brevemente la actividad de aprendizaje. En la sección 4 se presentan y comparan los resultados obtenidos por cada grupo en el pre-test y en el post-test, analizando el efecto que tiene la realización del juego de rol. En la sección 5 se resumen los principales resultados obtenidos.

2. Descripción de los grupos docentes

Para llevar a cabo la experiencia de aprendizaje, se han seleccionado cuatro grupos docentes de la Universidad del País Vasco (UPV/EHU), que denominaremos Vitoria, Leioa, Sarriko y Bilbao. Esta denominación corresponde al lugar físico donde se encuentra el centro docente. Los cuatro grupos docentes se diferencian tanto por los estudios que están cursando (corresponden a diferentes grados) como por la edad (2 grupos son de primer curso,

1 grupo es de segundo curso y el cuarto grupo es de las Aulas de la Experiencia). En la Tabla 1 se muestra la información sobre el grado, curso, asignatura, número de estudiantes que han participado en el pre-test y en el post-test y si antes del post-test se ha llevado a cabo el juego de rol. Como se puede observar, en los grupos Vitoria y Sarriko se ha realizado tanto el pre-test como el post-test sin haber realizado el juego de rol. En el grupo Leioa se ha realizado el pre-test y el post-test pero antes de realizar el post-test se ha llevado a cabo el juego de rol. En el caso del grupo Bilbao, que corresponde a las Aulas de la Experiencia, se ha realizado el pre-test y a lo largo del mes de mayo se llevará a cabo el juego de rol antes del post-test.

Tabla 1
Características de los grupos docentes que participan en la experiencia de aprendizaje

Grupo Docente	Grado (curso)	Asignatura	Estudiantes pre-test	Estudiantes post-test	Juego de rol
Vitoria	Administración y Dirección de Empresas (1º ADE)	Introducción Microeconomía	46	43	NO
Leioa	Relaciones Laborales y Recursos Humanos (1º RLRH)	Economía Política	27	21	SÍ
Sarriko	Fiscalidad y Administraciones Públicas (2º FAP)	Valoración de activos empresariales	12	20	NO
Bilbao	Aulas de la Experiencia	Microeconomía	24	pdte	pdte
			Total: 109	Total: pdte.	

3. Actividad de aprendizaje

La actividad de aprendizaje que hemos preparado tiene 3 partes. La primera parte consiste en un pre-test de 10 preguntas y se lleva a cabo en todos los grupos. La segunda parte consiste en la realización del juego de rol y sólo se lleva a cabo en algunos de los grupos para analizar y comparar la efectividad del juego en el aprendizaje sobre cambio climático. La tercera y última parte es un post-test de 10 preguntas que se realiza en todos los grupos.

En el anexo se recogen las preguntas incluidas en el pre-test y post-test que se pasan a todos los grupos.

Los grupos docentes seleccionados para desarrollar la tarea de aprendizaje no tienen, en sus respectivos grados, ninguna asignatura que trate explícitamente sobre cambio climático. Por tanto, sus conocimientos iniciales sobre el tema dependen del interés concreto que cada participante tenga y quedará recogido en los resultados del pre-test para todos y en los resultados del post-test en el caso de los grupos donde no se realiza el juego.

Para los grupos donde se realiza el juego, se ha diseñado un material para explicar e introducir los principales conceptos sobre economía del cambio climático que se presentan junto al juego. Comparando los resultados del post-test entre los grupos que han realizado el juego y los que no lo han realizado, se podrá observar los efectos que el juego tiene en el aprendizaje.

4. Resultados

A continuación, se presentan los resultados preliminares obtenidos en el pre-test y post-test para los diferentes grupos. El pre-test se ha realizado en los cuatro grupos docentes y el pos-test se ha realizado en tres de los grupos. De estos tres grupos, en dos de ellos se ha realizado el post-test sin haber hecho el juego, mientras que en el tercer grupo el post-test se ha llevado a cabo tras la explicación de los conceptos básicos de cambio climático y una vez que han participado en el juego de rol. En el cuarto grupo docente se realizará el post-test en mayo después de haber realizado el juego.

4.1. Resultados Pre-test

La nota media obtenida por cada uno de los grupos en el pre-test es bastante similar y está cercana a 6 sobre 10. Como se puede observar en la tabla 2, no hay apenas desviaciones en los resultados medios de cada grupo con respecto a la media total, considerando a los 109 participantes como un solo grupo.

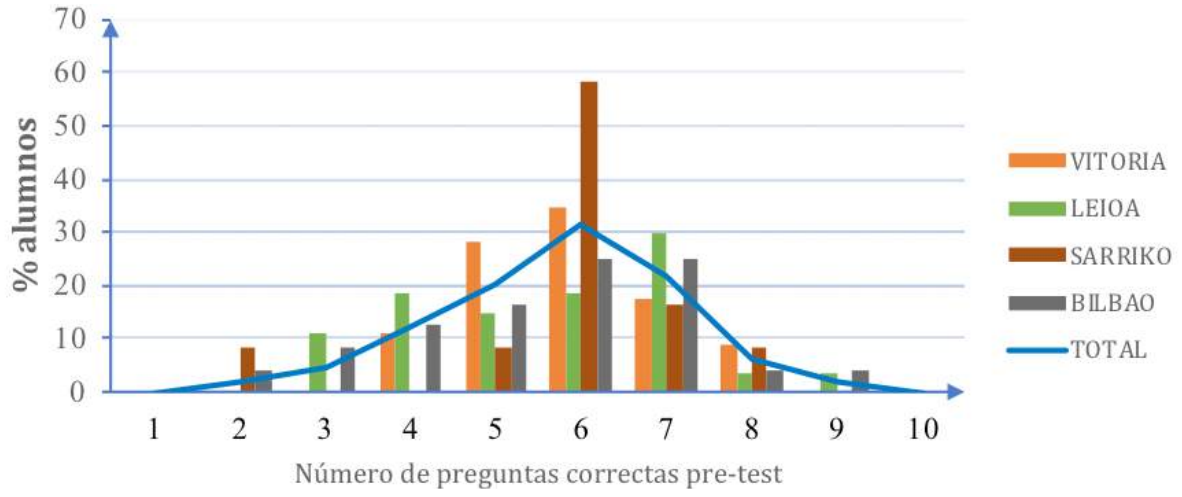
Tabla 2
Nota media del pre-test

Grupo	Vitoria	Leioa	Sarriko	Bilbao	Total
Nota media (pre-test)	5,85	5,63	5,92	5,62	5,75

Analizando los resultados de cada grupo en cada una de las 10 preguntas del pre-test, hemos comprobado que no hay diferencias entre los grupos con respecto a qué preguntas aciertan y qué preguntas son las que más fallan.

En la figura 1 se muestra la distribución de estudiantes en función de la nota obtenida en el pre-test (0 a 10) tanto para cada uno de los grupos (Vitoria, Leioa, Sarriko y Bilbao) como para el conjunto de todos ellos (línea azul).

Figura 1
Notas obtenidas en el pre-test sobre Cambio Climático



4.2. Juego de negociación climática

Por cuestiones de tiempo, el juego de rol que se lleva a cabo, es una versión simplificada del juego completo (Lucas, Escapa y González-Eguino, 2015). De momento sólo se ha realizado el juego, antes del post-test, en el grupo Leioa. Durante el mes de mayo, antes de finalizar el curso, se realizará el juego en el grupo Bilbao.

El juego simplificado consiste en una única ronda de negociación donde los participantes (divididos en 10 grupos de países que representan a todos los países del mundo) deben decidir si firman o no un acuerdo sobre cambio climático. En concreto, firmar el acuerdo significa que se comprometen a reducir sus emisiones de CO_2, contribuyendo así a mitigar los efectos negativos del cambio climático en el futuro.

Para que el acuerdo salga adelantes es necesario que lo firmen al menos 7 de los 10 países. Si un país decide firmar el acuerdo, tiene que reducir sus emisiones lo que supone un coste para él y un beneficio para todos los países, debido al carácter de bien público que tiene la reducción de emisiones. El beneficio y el coste es diferente para cada país y es una información privada que pueden decidir compartir o no.

Si no hay negociación, no habrá acuerdo, ya que individualmente la mejor estrategia de varios países es no firmar. Sin embargo, a nivel mundial las ganancias conjuntas si todos firman el acuerdo, son mayores que si no hay acuerdo. Así, se explica que es posible realizar transferencias/pagos a otros países para que firmen o no el acuerdo. Los países, por lo tanto, tienen libertad para negociar y comprometer pagos mediante acuerdos bilaterales o multilaterales.

Una vez explicado el juego, cada grupo de estudiantes recibe las instrucciones e información del país al que representa y se inicia el proceso de negociación donde negocian libremente unos con otros para decidir su voto y las posibles transferencias de renta entre ellos.. Una vez finalizado el tiempo para negociar, los países emiten su voto y se calculan los pagos para cada país, en función de si se ha alcanzado o no el acuerdo y de si el país en cuestión lo ha firmado o no.

4.3. Resultados Post-test

En la tabla 3 se muestra la media obtenida por cada uno de los grupos en el post-test, excepto en el grupo Bilbao donde aún no se ha llevado a cabo. Se puede apreciar una gran diferencia en la nota media obtenida por el grupo Leioa, donde se ha realizado previamente el juego de rol, frente a la nota media obtenida por los grupos Vitoria y Sarriko, en los que no se ha realizado el juego. De hecho, en los grupos Vitoria y Sarriko la nota media del post-test es inferior a la nota media que obtuvieron en el pre-test.

Tabla 3
Nota media del post-test

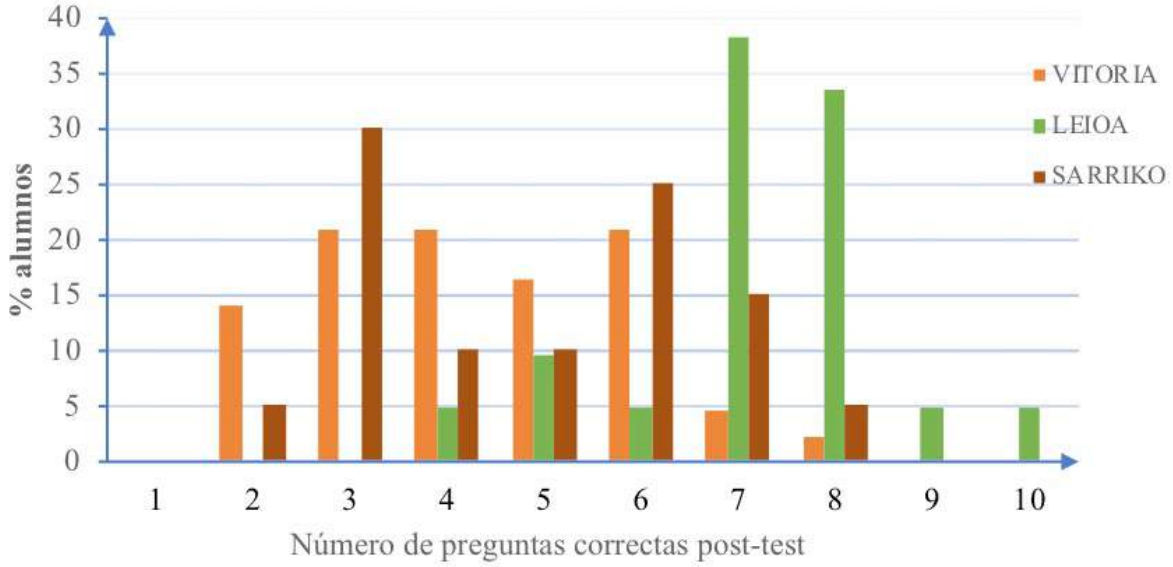
Grupo	Vitoria	Leioa	Sarriko	Bilbao
Nota media (post-test)	4,32	7,19	4,85	Pdte

Este efecto positivo del juego en el aprendizaje se puede observar claramente también en la figura 2. El porcentaje de alumnos que obtienen una nota superior a 6 en el grupo donde se

ha realizado el juego (Leioa) es superior a los grupos donde no se ha realizado el juego (Vitoria y Sarriko). En los grupos de Vitoria y Sarriko, el porcentaje de alumnos que obtienen menos de un 5 ha aumentado respecto al pre-test.

Figura 2

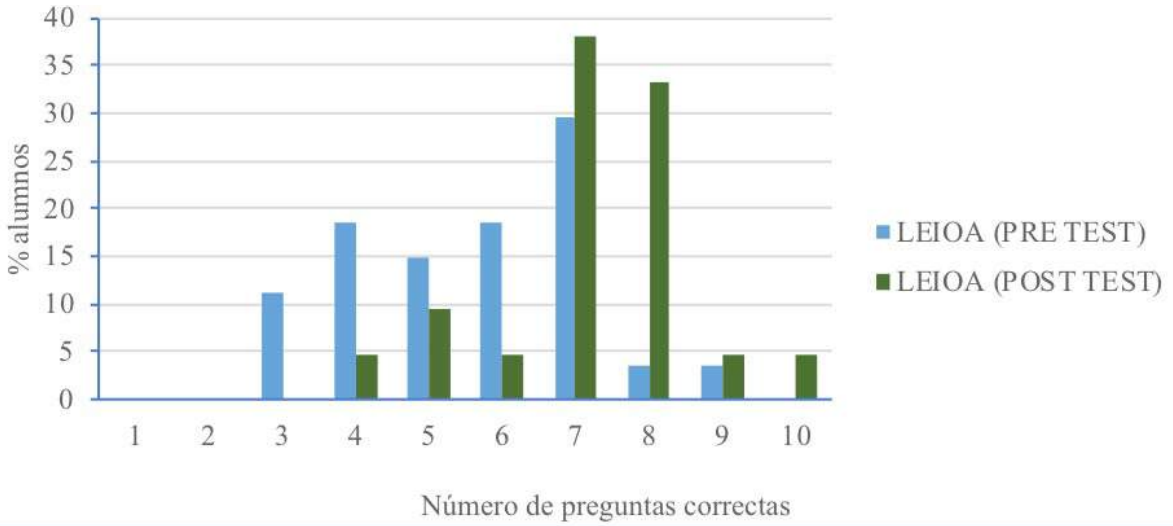
Notas obtenidas en el post-test sobre Cambio Climático



En la figura 3, se muestra la comparación de los resultados del pre-test y post-test para el grupo Leioa, donde se ha realizado el juego sobre negociación climática, y se puede observar la mejora en los resultados obtenidos por este grupo. Cuando tengamos los resultados del post-test en el grupo Bilbao, donde previamente realizaremos el juego, podremos compararlo con los resultados del grupo Leioa y comprobar si se mantiene este efecto positivo del juego de rol sobre el aprendizaje.

Figura 3

Evaluación de conocimientos sobre cambio climático antes y después del juego de rol



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Anexo I. Pre-Test sobre cambio climático

1. **El cambio climático se debe únicamente a causas naturales que aumentan los gases de efecto invernadero:**

   a) Verdadero.
   b) Falso.

2. **¿Cuál es el gas de efecto invernadero más potente?**

   a) Gases fluorados (HFC, PFC, SF6).
   b) CO_2.
   c) Óxido de nitrógeno.
   d) Metano.

3. **¿Cómo actúa el efecto invernadero?**

   a) Los gases de efecto invernadero reflejan la energía del sol provocando que la tierra se caliente.
   b) Los gases de efecto invernadero absorben la energía del sol haciendo que el calor no se escape al espacio.
   c) Los gases de efecto invernadero calientan directamente los océanos provocando cambios dramáticos en el tiempo.
   d) Los océanos absorben los gases de efecto invernadero que causan que la temperatura de la Tierra aumente.

4. **El cambio climático está acelerando la reducción de la capa de hielo y nieve.**

   a) Verdadero.
   b) Falso.

5. **¿Cuál de las siguientes industrias pueden verse afectadas negativamente por el cambio climático?**

   a) El sector de los seguros
   b) Sector del vino
   c) Pesca comercial
   d) Todas las anteriores

6. **¿Qué papel juegan los océanos en el ciclo del carbono?**

   a) Son la mayor fuente de CO_2.
   b) Son los que más absorben CO_2.
   c) Tanto a como b son ciertas.
   d) Tanto a como b son falsas.

7. **El CO_2 no es el único compuesto que contiene carbono en la atmósfera que los investigadores están estudiando. ¿Qué más gases están investigando los científicos?**

   a) Monóxido de Carbono.
   b) Metano.
   c) Hollín del carbón negro.
   d) Todas las anteriores.

8. **¿Cuál de las siguientes acciones aumenta el nivel de CO_2 en la atmósfera?**

   a) Conducir un coche.
   b) Viajar en avión.
   c) Talar árboles.
   d) Todas las anteriores.

9. **¿Qué país emite actualmente más gases de efecto invernadero?**

   a) Estados Unidos.
   b) Reino Unido.
   c) China.
   d) India.

10. **Durante el año 2015 se celebró la Conferencia de las Naciones Unidas sobre Cambio Climático en París, ¿Cuántos países acordaron duplicar la investigación en tecnologías más limpias?**

    a) 76.
    b) 20.
    c) 195.
    d) 12.

Anexo II. Post-Test sobre cambio climático

1. **Según la Organización de Naciones Unidas (ONU), el ser humano es el principal responsable del cambio climático con una probabilidad del**

   a) 95%.
   b) 85%.
   c) 60%.
   d) 50%.

2. **¿Cuál de las siguientes actividades tiene más efecto en el cambio climático actual?**

   a) Ganadería.
   b) Uso de combustibles fósiles.
   c) La actividad solar.
   d) La destrucción de selvas tropicales.

3. **¿Qué organización internacional es la responsable de elaborar informes regulares sobre el Cambio Climático?**

   a) El Programa de las Naciones Unidas para el Medio Ambiente (UNEP).
   b) El Consejo Internacional para la Ciencia (ICSU).
   c) El Grupo Intergubernamental del Cambio Climático (IPCC).
   d) La Directiva de Prevención y Control Integrado de la Contaminación (IPPC).

4. **Las decisiones sobre los límites del calentamiento global son discutidas y aprobadas en:**

   a) Las Conferencias de las Partes (COP).
   b) Las Conferencias de las Naciones Unidas sobre el Medioambiente y el Desarrollo.
   c) La Conferencia de Naciones Unidas sobre el Medio Humano.
   d) La Conferencia de Naciones Unidas sobre Comercio y Desarrollo.

5. **¿Qué país emite a la atmósfera más gases de efecto invernadero?**

   a) China.
   b) Rusia.
   c) Estados Unidos.
   d) Unión Europea.

6. **Las políticas de mitigación del cambio climático tienen por objeto:**

   a) Tomar medidas para disminuir los impactos del cambio climático.
   b) Asegurar y mantener la estabilidad económica.
   c) Reducir las emisiones de gases de efecto invernadero a la atmósfera.
   d) Reducir las desigualdades sociales.

7. **Si un país decide reducir sus emisiones de gases de efecto invernadero, generará**

   a) Un coste y un beneficio sólo para ese país.
   b) Un coste para ese país pero un beneficio para todos los países.
   c) Un beneficio para todos los países sin ningún coste para él.
   d) Un beneficio para ese país y un coste para el resto de países.

8. **Una de las consecuencias del cambio climático es que las olas de calor serán:**

   a) Menos frecuentes y menos intensas.
   b) Más frecuentes, pero menos intensas.
   c) Más intensas, pero menos frecuentes.
   d) Más frecuentes y más intensas.

9. **¿Cuándo se firmó el Acuerdo de París sobre cambio climático?**

   a) 2015.
   b) 2005.
   c) 2000.
   d) 1997.

10. **El Acuerdo de Paris establece un plan de acción mundial para limitar el aumento de la temperatura media del planeta (en relación al nivel preindustrial)**

    a) 4°C.
    b) 3°C.
    c) 2°C.
    d) 1°C.

Ocean i³: proyecto internacional de innovación educativa para la sostenibilidad del océano

Campus Ocean, Universidad del País Vasco (UPV/EHU) y Universidad de Burdeos

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Abstract

Ocean i³ Project[1] is focused on the challenge "oceans plastic pollution" and its mission is to contribute to the reduction of pollution on the basque-aquitaine transboundary coast.

It is an educational innovation project that seeks to develop blue skills of university students who develops research, entrepreneurship and training projects. Those projects oriented to the *2030 Sustainable Development Goals (SDG-UN)*[2].

Ocean i³ adopts the "Mission-Oriented Research and Innovation" approach (Mazzucato, 2018), and Civic University (Godard, 2012). It is about curricular projects concerning this global challenge and local mission. The project mobilises collaboration and co-construction of knowledge as well as solutions in close collaboration with territorial agents from the public, private and civil society sectors. Cross border is a key dimension regarding specific contents and skills it demands.

The competences being developed, amongst others, have to do with interdisciplinarity, cross-sectorial approaches, systemic and heuristic approach to complex problems, integration of SDG dimensions and values as well as skills to be able to manage intercultural and multilingual contexts.

Resumen

El Proyecto *Ocean i³* se orienta a un reto marco, la "contaminación de los océanos por plásticos" y se plantea como misión contribuir a la reducción de esta contaminación en la costa transfronteriza vasco-aquitana.

Se trata de un proyecto de innovación educativa en el que se busca desarrollar competencias azules en el alumnado universitario. El alumnado realiza proyectos en investigación, en emprendizaje o en el marco de sus prácticas profesionalizantes. Los proyectos se orientan a retos vinculados con los Objetivos de Desarrollo Sustentable 2030 (ODS-ONU).

Ocean i³ adopta el enfoque Investigación e Innovación Orientada a Misiones (Mazzucato, 2018), y se plantea en clave de Universidad Cívica (Godard, 2012). Consiste así en articular proyectos curriculares del alumnado en torno a un reto global y una misión local. Moviliza una comunidad ampliada de aprendizaje basada e la colaboración y co-construcción de conocimientos y soluciones en estrecha colaboración con agentes territoriales de los sectores público, privado y de la sociedad civil. El anclaje transfronterizo y eurorregional es una clave fundamental por el tipo de contenidos y competencias que se requiere movilizar.

[1] *Ikaskuntza/Learning – Ikerkuntza/Research – Iraunkortasuna/Sustainable Development.*

[2] Se trata de los 17 objetivos adoptados el 1.º de enero de 2016 por los dirigentes mundiales en el marco de la Organización de Naciones Unidas: https://www.un.org/sustainabledevelopment/es/

El proceso de aprendizaje en *Ocean i*[3] promueve competencias vinculadas con: la visión sistémica e integrada de los problemas, la interdisciplinariedad, el emprendizaje, la integración de dimensiones y valores relacionados con los Objetivos de Desarrollo sustentable 2030 (ODS), así como habilidades para gestionar situaciones interculturales y multilingües.

1. Introducción

El proyecto *Ocean i*[3] es un Proyecto experimental que se desarrolla en el marco del partenariado "Campus Bordeaux-Euskampus. Forma parte de las actuaciones del Campus Ocean Experiences (COE)[3], mediante el cual la Universidad de Bordeaux y la Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU) se posicionan en relación a la economía azul y participan en la estrategia de especialización inteligente transfronteriza y eurorregional "*Ocean Experiences*" que asocia y moviliza al conjunto de agentes vasco-aquitanos del sector de deportes de deslizamiento y de acción acuáticos.

En su núcleo, se trata de un proyecto internacional e interuniversitario de innovación en educación y empleabilidad. Sin embargo, su compromiso con el territorio y sus metodologías inmersivas y orientadas a retos reales, le convierten a su vez en un dispositivo que contribuye a desarrollar competencias pertinentes en la cuenca de empleo vinculada con la economía azul transfronteriza eurorregional.

Ocean i3 tiene por vocación ser un proyecto piloto para el *Campus Ocean Experiences* en particular y transferible a otros ámbitos del Campus Bordeaux-Euskampus. Las dimensiones que se ponen en juego en este proyecto son representativas de las apuestas de ambas universidades en términos de innovación pedagógica e internacionalización y pretende así aportar experiencia para la estructuración de otros proyectos en colaboración.

2. Descripción conceptual del proyecto

Ocean i[3] conforma un ecosistema con una importante complejidad en relación con 5 niveles: conceptual, pedagógico, institucional, valores y compromiso territorial. El siguiente gráfico, ilustra la vinculación entre estos distintos niveles y sus dimensiones.

Conceptualmente integra elementos de 3 enfoques: orientación a misiones, responsabilidad e innovación responsables (RRI) y universidad cívica. La orientación a misiones consiste en identificar un reto global, seleccionar una o varias misiones y definir objetivos concretos para cada misión[4]. Se estimulan procesos *bottom-up* de colaboración entre agentes heterogéneos y de interdisciplinariedad, así como nuevas formas de participación entre los sectores público, privado y la sociedad civil para co-diseñar propuestas y soluciones novedosas (Mazzucato, 2018).

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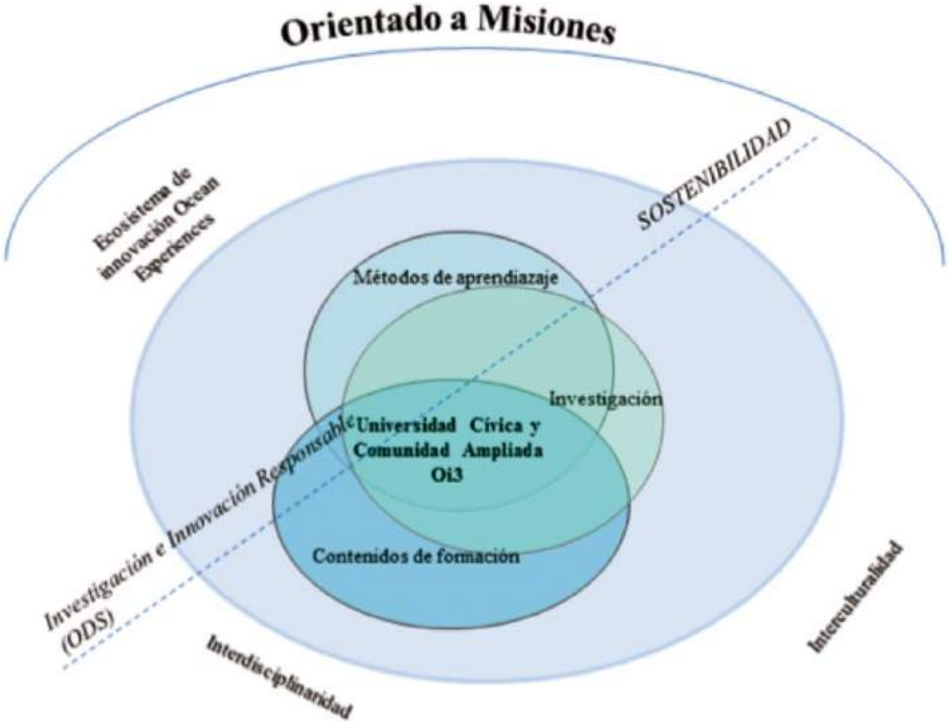
[3] Creado en 2015 por ambas universidades en convenio con la Comunidad de Aglomeración País Vasco-Nueva Aquitania, el Campus Ocean es uno de los 3 pilares del ecosistema de innovación de la estrategia de especialización territorial *Ocean Experiences* junto con una Halle Creativa-FABlab para prototipado de productos, y el Ocean LivingLab (laboratorio a cielo abierto y test de productos).

[4] El reto de la contaminación del océano por plásticos se ha seleccionado conjuntamente con un comité de agentes territoriales a partir del dictamen "Identificación de problemáticas en el litoral vasco-aquitano" elaborado por el equipo internacional de alumnado del proyecto Plataforma Jurídica Ocean 16-17, ver Alkorta *et al.* (2017). El proyecto Plataforma Jurídica Ocean (unidisciplinar) identificó retos complejos y evolucionó así en el proyecto Ocean i3 multidisciplinar.

El enfoque RRI está presente principalmente en la conformación de la comunidad ampliada Ocean i3 que define los retos, misiones, problemas y a continuación se plantea producir conocimientos y soluciones "deseadas socialmente" y orientadas a "impactos positivos". La pauta RRI asocia la noción de responsabilidad a: inclusividad, "desirabilidad social" y búsqueda de "right impacts", (Owen, 2012).

El enfoque de universidad cívica es complementario de los anteriores y pone de relieve el papel de la universidad en pos de un compromiso renovado con agentes y problemáticas en las escalas regionales movilizando sus capacidades de enseñanza e investigación para el beneficio público (Goddard *et al.,* 2012). En el caso de Ocean i3 el compromiso como universidad cívica se materializa en la articulación con la estrategia de especialización inteligente territorial Ocean Experiences a la vez que en su implicación con las particularidades de la economía azul transfronteriza y su realidad multicultural y multilingüe.

Gráfico 1



Desde el punto de vista de los valores asume un compromiso explícito y transversal con los Objetivos de Desarrollo Sustentable 2030 (ODS). Los objetivos 8 y 14 están particularmente presentes aunque tal como sugiere Murga-Menoyo (2015:57) desde el punto de vista pedagógico se establece una diferencia entre educación "sobre" la sostenibilidad (contenidos) y educación "para" la sostenibilidad (comportamientos y competencias).

En términos pedagógicos el objetivo principal de Ocean i3 es crear el contexto que permita promover experiencias de aprendizaje de alto impacto. Su clave es la inmersión y compromiso del alumnado y el profesorado con problemas y agentes reales del territorio. Los procesos de aprendizaje se basan en proyectos (de investigación, de emprendizaje, o aplicados en prácticas profesionalizantes) que requerirán producir y movilizar "contenidos de formación" en función de los retos, problemas, y experiencias de aplicación.

En apoyo de estos procesos el equipo docente internacional de innovación acompaña los proyectos explorando y movilizando "métodos de aprendizaje" activos y colaborativos, centrados en el alumnado con énfasis en el "aprendizaje basado en la investigación" (RBL-*Research Based learning*).

La orientación a misiones y a retos reales impone una aproximación compleja de los problemas que requerirá visiones cruzadas tanto disciplinarias como de perspectivas de agentes diversos. Ocean i3 propone talleres de trabajo en los que se comparten e integran visiones disciplinarias y perspectivas diversas movilizando y creando poco a poco una "comunidad ampliada Ocean i3" de agentes académicos, económicos y sociales.

3. Objetivos y competencias

El proyecto se orienta hacia tres tipos de objetivos:

Objetivos de Aprendizaje: consiste en co-diseñar un dispositivo específico de aprendizaje inmersivo y orientado a la empleabilidad que pueda incardinarse en diversas titulaciones de grado y máster que garanticen el resultado de aprendizaje de competencias transversales con sustrato ODS.

El equipo internacional de innovación reflexiona sobre el tipo de competencias específicas que permita ejercitar y desarrollar Ocean i3 para cada una de sus tres dimensiones: aprendizaje, investigación y sostenibilidad.

Para esta primera edición 18-19 y con base en la experiencia realizada con el proyecto antecedente Plataforma Jurídica Ocean, se está experimentando con la activación de capacidades transversales relacionadas con:

a) *Aprendizaje / Ikaskuntza en términos de competencias de:*

- capacidad comunicar y trabajar en contextos interculturales y multilingues
- capacidad de negociación, participación horizontal y compromiso para compartir resultados
- capacidad de escucha activa, interpretación, interrelación e interacción.

b) *Investigación / Ikerkuntza en términos de competencias de:*

- capacidad de análisis, comprensión y resolución de problemas complejos
- creatividad: elaboración de modelos resolución de problemas desde ángulos divergentes
- capacidad de preparación de informes expertos basados en métodos de investigación.

c) *Desarrollo sostenible/ Iraunkortasuna en términos de competencias de:*

- Aproximación transversal a los problemas: capacidad de integración y de gestión de conceptos de diversas disciplinas.
- Integración de dimensiones ODS.
- Desarrollo de la visión sistémica e integradora de los problemas.

Se trata de funcionar en modo de laboratorio pedagógico para afinar el planteamiento sobre competencias específicas que permite poner en práctica Ocean i3.

Dos enunciados generalizados en la literatura y confirmados por organismos internacionales orientan la reflexión. El primero, se refiere a que el 75% de las profesiones de futuro

aún no se conocen (Foro Eoconómico Mundial 2018); el segundo indica que las competencias llamadas transversales, *soft*, sociales y emocionales[5] o cualidades personales[6] (según el enfoque que se utilice) son las que serán más requeridas en el siglo xxi (OCDE, 2018).

Para identificar cuáles son las competencias que está requiriendo y requerirá el sector de la economía azul transfronteriza se propone una metodología que llamamos "*ongoing blue-skills*" [7] en un trabajo conjunto universidad-empresa/sociedad. Esta metodología implica la inmersión directa del alumnado en el medio profesionalizante y un acompañamiento del profesorado que a su vez se impregnarse de las necesidades, dinámicas y retos de este sector para poder así orientar y formar en competencias azules.

Objetivo de innovación pedagógica: consiste en conformar un «Equipo Internacional de Innovación Pedagógica" que además de tutorizar al alumnado, asume el diseño metodológico del dispositivo Ocean i3, la formulación del módulo de aprendizaje y su integración en los currícula de Grado y Máster. Funciona con base en la experimentación y en modo de comunidad de aprendizaje contando con el acompañamiento de las estructuras de innovación educativa de ambas universidades: Servicio de Asesoramiento Educativo SAE/HELAZ UPV/EHU y Mission d'Appui à la Pedagogie et à l'Innovation MAPI-UB.

Objetivo de universidad cívica: consiste en generar la comunidad ampliada Ocean i3 multidisciplinar y multiagente que interactua de forma horizontal al servicio del reto seleccionado en cada etapa del proyecto. La comunidad ampliada Ocean i3 se moviliza en distintas etapas del proyecto: para identificar problemáticas pertinentes que trabajará el alumnado, integrar informaciones de contexto, aprendizaje en inmersión (prácticas, visitas, etc.) contrastar, valorizar y difundir o socializar resultados. Además, se implica en el taller de evaluación del dispositivo pedagógico y en la identificación y sistematización de una rúbrica de competencias y habilidades requeridas en la economía azul con el fin de ajustar expectativas y oportunidades mutuas en formación, investigación, emprendizaje y empleabilidad.

4. Comunidad de proyecto

La comunidad de proyecto Ocean i3 se estructura del siguiente modo:

— El *equipo de proyecto Campus Ocean* (COE) participa activamente en la conceptualización y diseño del proyecto, asume funciones facilitación entre la comunidad universitaria y los agentes territoriales y resuelve aspectos de organización y logística.

[5] El Proyecto Educación 2030 define que los futuros profesionales deberán aportar valor a la dimensión colectiva de la prosperidad, la perennidad y el bienestar. Deberán ser responsables y autónomas y priorizar la colaboración antes que la división y la sostenibilidad (OCDE 2018: 4).

[6] García Alvarez reflexiona sobre el marco de competencias del siglo xxi Foro Económico Mundial. Con base en el concepto de *Imagination Age* de King (2007) subraya la novedad e importancia de las "cualidades personales" como curiosidad, iniciativa, persistencia, adaptabilidad, liderazgo y conciencia social y cultural. Un conjunto de meta-competencias más abarcativas que el conocimiento general y las habilidades tradicionales que facilitan la adaptación y la flexibilidad para la colaboración frente a problemas complejos (*2018:*155).

[7] La CE (2018) ha conformado un grupo experto para elaborar una rúbrica de *blue skills*. Sin embargo Ocean i3 apuesta por la metodología *botton up* "ongoing blue skills" que está experimentando para tener en cuenta la dinámica emergente del sector, el desconocimiento de los empleos de futuro y las especificidades del ecosistema transfronterzio. Las rúbricas genéricas pueden quedar rápidamente desactualizadas o no ajustarse a la realidad local.

— La *coordinación académica,* incluye una persona referente de cada universidad que centraliza la vinculación entre equipos docentes, equipo COE y las instancias universitarias (direcciones, servicios, vicerrectorados, etc.).
— El *equipo internacional de innovación,* conformado por el personal docente investigador de ambas universidades que tutoriza al alumnado y participa en el diseño del dispositivo, de metodologías y en la identificación de competencias Oi3.
— El *equipo internacional de alumnado,* conformado por alumnado de 4.º de grado y de Master en UPV/EHU y de Licencia, Master y Diplomas Universitarios en UB.
— La *comunidad ampliada Ocean i3* incluye a la comunidad universitaria conjuntamente con agentes territoriales públicos transfronterizos y tiene participación en los distintos momentos del ciclo del proyecto: desde la identificación de retos hasta la valoración, evaluación de resultados. Permite el anclaje territorial real de los proyectos del alumnado.
— El *comité de seguimiento* incluye instancias de decisión de ambas universidades, agentes sociales y referentes internacionales (académicos, del ámbito de programas europeos, etc.). Permitirá contrastar y orientar el desarrollo del proyecto con referencia a estándares internacionales.

5. Desarrollo del proyecto

El proyecto Ocean i3 se desarrolla durante el segundo semestre de curso académico.

Cada alumna y alumno se integra con su proyecto individual que corresponde a una actividad curricular del plan de estudios de su titulación. El profesorado tutor, les propone realizar su trabajo de forma coordinada con las actividades de Ocean i3.

En la etapa actual experimental tanto el alumnado como el profesorado, además de comprometerse con la dinámica colaborativa, interdisciplinar e internacional que propone el proyecto asumen un papel activo como comunidad de diseño e innovación del dispositivo. Participan en actividades de inteligencia colectiva, de planificación y de valoración.

La actividad compartida por la comunidad Ocean i3 se estructura en: 5 talleres transfronterizos con objetivos adaptados a cada etapa del proyecto, 1 actividad de ciencia ciudadana y trabajo colaborativo con apoyo en herramientas TIC.

La dimensión de multilingüismo e interculturalidad se incorpora de forma transversal en todas las actividades. Cuenta con apoyo de un equipo de investigación experto que realiza observación y acompañamiento centrado en un enfoque de "conciencia de uso del lenguaje" y activación de recursos de comunicación más abarcativos que el idiomático. Se trabaja en modo laboratorio para definir pautas adaptadas a la complejidad del proyecto (interinstitucional, intercultural, multilingüe, internacional) con vocación de trasladarse a otros proyectos del COE y del Campus Bordeaux-Euskampus.

A continuación, se describen los 5 talleres que estructuraron este primer ciclo de proyecto experimental:

Tabla 1

Taller	Participantes	Objetivo	Resultado
Taller 1 Enero 2019	Equipo COE Equipo docente Agentes territoriales	Integración y coordinación interna Diseño de actividades Estudio y gestión de la interculturalidad y multilingüismo Instalaciones y proyectos del territorio	Cartografía del proyecto: participantes, titulaciones, modalidades de proyectos.
Taller 2 Marzo 2019	Comunidad ampliada Oi3 Alumnado de IKD GAZtE UPV/EHU	Integración del equipo internacional de alumnado Presentación de información y proyectos del contexto territorial (agentes) Puesta en común de trabajos disciplinares y oportunidades interdisciplinares. Diseño de actividad de intervención Estudio y gestión de la interculturalidad y multilingüismo Diseño y planificación de actividades	Mapa mental 1 Diseño de actividad de intervención Planificación de Taller 3
Ciencia ciudadana	Alumnado Ocean i3 e IKD GAZtE	Difusión y sensibilización en terreno	Actividad en la playa
Taller 3	Comunidad ampliada Oi3	Presentación e integración de resultados individuales Intervenciones expertas, contraste con agentes. Visita a instalaciones y proyectos del territorio Estudio y gestión de la interculturalidad y multilinguismo	Mapa mental 2 Planificación de talleres 4 y 5
Taller 4	Comunidad ampliada Oi3	Contraste de resultados Identificación de competencias Ocean i3 y competencias azules	Presentaciones orales Informes Protocolo Interculturalidad y multilingüismo 1.ª Rúbrica de competencias azules Oi3
Taller 5	Comunidad ampliada Oi3 Comité seguimiento internacional	Evaluación y prospectiva del dispositivo pedagógico	Dictamen de auto-evaluación y recomendaciones.

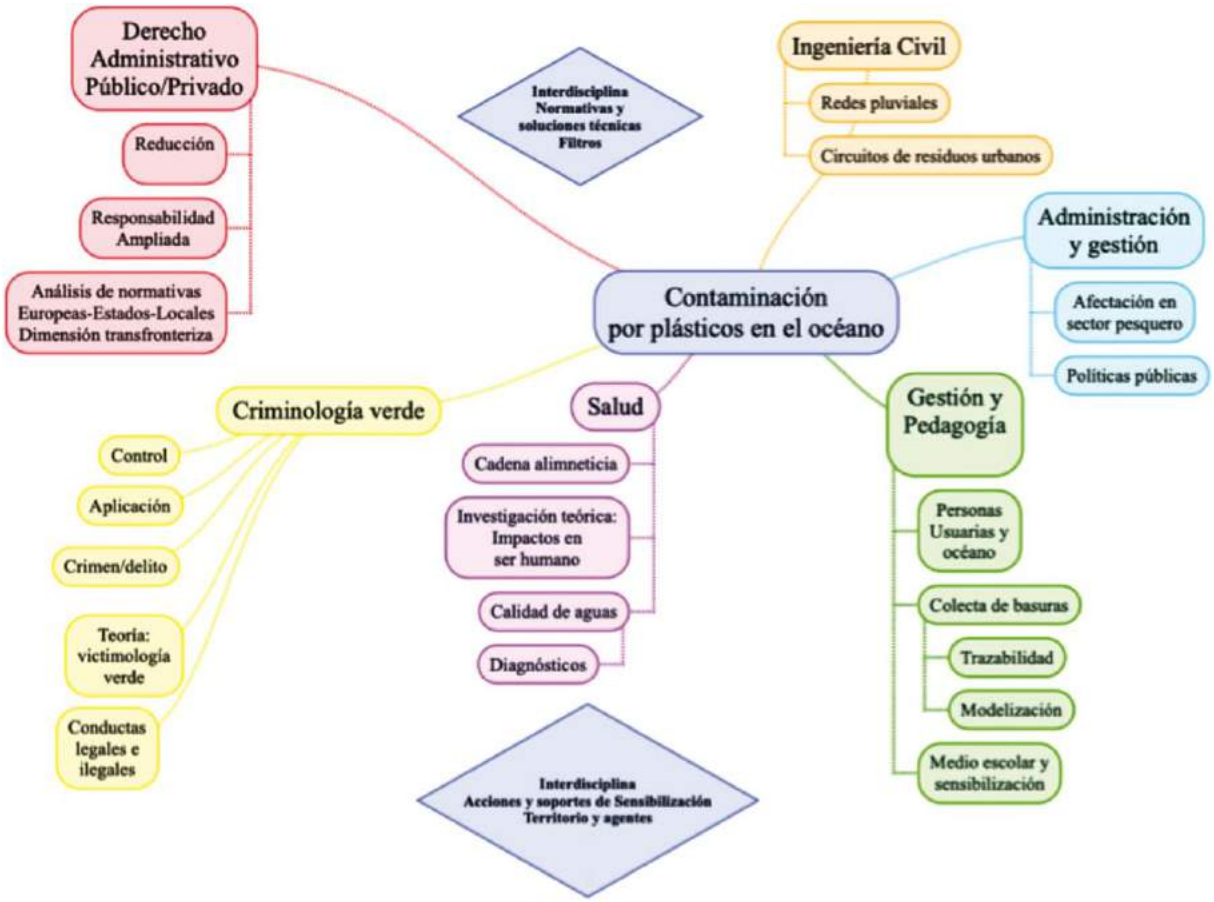
6. Aproximaciones disciplinares y oportunidades interdisciplinares del reto

Como resultado del primer taller se obtuvo el siguiente mapa conceptual que ofrece una visión de conjunto de los temas y dimensiones que se está trabajando desde cada uno de los campos disciplinarios.

Como ejemplo del potencial que tiene la puesta en común interdisciplinar, se han definido y ya se han activado dos campos de colaboración:

a) Alumnado de derecho y de ingeniería están trabajando conjuntamente para identificar normativas vinculadas con la responsabilidad en la gestión de redes pluviales que se tendrán en cuenta para el diseño de prototipos de soluciones técnicas (filtros).
b) Las informaciones que el alumnado de distintas disciplinas está sistematizando sobre normativas, conductas y situación del sector pesquero, estudios sobre impacto en la salud humana, etc., se utilizarán para el diseño de soportes audiovisuales de difusión y actividades de intervención para la sensibilización.

Gráfico 2



7. Indicadores descriptivos para el seguimiento

Los siguientes indicadores se han definido para apoyar el seguimiento del proyecto, los datos corresponden al curso 18-19.

Tabla 2

Indicador	Dato 18-19
N.º Trabajo fin de Grado/Trabajo Estudio e Investigación	9
N.º Trabajo Fin de Master	3
N.º Proyectos tutorizados	2
N.º proyectos (otra modalidad)	2
N.º Contratos de prácticas	3
N.º Créditos ECTS asociados	127
N.º de Agentes sociales y económicos movilizados	13
N.º de intervenciones de expertos	5
N.º de profesorado participantes	22
N.º de alumnado	15
N.º de titulaciones implicadas	12
N.º de Centros de investigación implicados	6
N.º de servicios/direcciones implicadas	11
N.º de proyectos competitivos presentados	1
N.º de publicaciones/intervenciones en medios/Webs	3
N.º de comunicaciones académicas internacionales	2
N.º de intervenciones en eventos internacionales	2
N.º Intervenciones Ciencia ciudadana	1

8. Conclusiones

El proyecto Ocean i3 está cumpliendo un papel piloto ejemplificador para la concepción de un proyecto más amplio como es el Campus Ocean Experiences que posiciona una alianza estratégica entre dos universidades en el ámbito de la valorización y sostenibilidad de los océanos.

A partir de su foco dedicado a la innovación educativa y la empleabilidad, permite experimentar un conjunto complejo de dimensiones que atañen directamente al papel de universidad cívica que el Campus Bordeaux-Euskampus quiere jugar en un ecosistema de innovación particular como es el transfronterizo.

La dinámica de aprendizaje por proyectos inmersivos, que se apoya en una comunidad ampliada territorial inclusiva y responsable es el elemento clave a la hora de desarrollar competencias territorialmente pertinentes y adaptadas a las demandas del siglo XXI, resolución de problemas complejos con creatividad, imaginación colectiva y responsabilidad.

El ejercicio de movilizar la comunidad ampliada con orientación a misiones asociadas a los objetivos de desarrollo sostenible y vinculadas con la economía azul es una experiencia que puede enriquecer un enfoque de educación en sostenibilidad trasladable a otros ámbitos temáticos.

9. Agradecimientos

Para el curso 18-19 el proyecto ha contado con financiación de UPV/EHU, de Euskampus Fundazioa y de IdEx Bordeaux *Programme Formations de Demain.*

Expresamos un agradecimiento especial a la Comunidad Ampliada Ocean i3 (alumnado, profesorado y agentes territoriales) que participa con entusiasmo y compromiso genuino en el diseño de este dispositivo experimental.

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Cálculo de la huella ambiental y social de la Escuela de Ingeniería de Bilbao (UPV/EHU)

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Abstract

The Organisation Environmental Footprint (OEF) is a multi-criteria measure of the environmental performance of an organisation performed with a life cycle perspective (Life-Cycle Assessment, LCA). This multi-criteria analysis involves the collection and evaluation of inputs (consumption), outputs (emissions, waste, etc.) and impacts derived from a specific activity. The objective of this work is to calculate the OEF of the academic activity of the Faculty of Engineering-Bilbao (FEB), of the University of the Basque Country (UPV/EHU). This work was performed by a multidisciplinary team of professors and research staff, administration and service staff and students of the UPV/EHU.

The calculation methodology was developed within the LCA approach, using as a reference the Organisation Environmental Footprint Guide promoted by the European Commission in 2013. Firstly, input and output data flows of the FEB activity, including transport, were collected. Next, environmental and social impacts of the academic activity were modelled, using Ecoinvent 3.3 and Soca v1 databases in openLCA software. In order to evaluate the environmental impacts, CML and ReCiPe LCIA methods were used. The Social Impact Weighting Method provided by openLCA and Soca was adjusted for the assessment of specific social impacts.

Results indicate that, excluded transport, energy consumption is the flow with the greatest environmental impact, followed by the consumption of material resources and, finally, waste treatment. Otherwise, most impacts (>50%) are located outside the Autonomous Community of the Basque Country. Regarding transport needs, although considered an upstream (indirect) activity, related impacts imply an important contribution. The assessment of some social impacts also shows a significant repercussion outside the Basque Country. Based on the results obtained, this work recommends some improvement actions to reduce environmental and social impacts of the FEB activity.

Resumen

La Huella Ambiental de las Organizaciones (HAO) es una medida multicriterio del comportamiento ambiental de una organización según una perspectiva de todo el ciclo de vida (Análisis de Ciclo de Vida, ACV). Este análisis multicriterio implica la recopilación y evaluación de las entradas (consumos), salidas (emisiones, residuos, etc.) e impactos derivados de una determinada actividad. El objetivo de este trabajo es el cálculo de la HAO de la actividad académica desarrollada en la Escuela de Ingeniería de Bilbao (EIB), de la Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU). Este trabajo ha sido llevado a cabo por un equipo multidisciplinar formado por personal docente e investigador, personal de administración de servicios y alumnado de la UPV/EHU.

La metodología de cálculo se ha desarrollado en el marco del ACV, utilizando como referencia la Guía de la Huella Ambiental de Organizaciones propuesta por la Comisión Europea en 2013. Primeramente, se han recopilado datos de flujos de entrada y salida de la actividad de la EIB, incluyendo las necesidades de transporte. Seguidamente, se han modelizado los impactos ambientales derivados de la actividad, utilizando las bases de datos Ecoinvent 3.3 y Soca v1 con el software openLCA. Para la evaluación de los impactos ambientales se han utilizado los métodos de evaluación *CML (Baseline) y ReCiPe*. El análisis de diversos impactos sociales se ha basado en un ajuste del *Social Impact Weighting Method* proporcionado por openLCA y Soca.

Los resultados indican que, excluido el transporte, el consumo energético es el flujo de mayor impacto ambiental, seguido del consumo de recursos materiales y, por último, el tratamiento de residuos.

Por otro lado, la mayor parte de los impactos (>50%) se localizan fuera de la Comunidad Autónoma del País Vasco. En lo que respecta a las necesidades de transporte, los resultados reflejan unos impactos asociados muy importantes, aunque se trate de una actividad previa indirecta. El análisis de diversos impactos sociales también muestra una importante repercusión fuera del País Vasco. En base a los resultados obtenidos, este trabajo propone acciones de mejora para reducir impactos ambientales y sociales de la actividad de la EIB.

1. Introducción

La Huella Ambiental de las Organizaciones (HAO) se define como una medida multicriterio del comportamiento ambiental de una organización que proporciona bienes o servicios según la perspectiva de todo el ciclo de vida (European Commission, 2012). El objetivo del cálculo de la HAO es estimar los impactos ambientales derivados de la actividad de una organización, con el fin de aplicar medidas para su reducción (UNEP, 2015). Existen multitud de herramientas para el cálculo de HAO (Edo *et al.*, 2018), pero en este trabajo se ha seguido la metodología propuesta por la Comisión Europea y facilitada por Ihobe, basada en las normas ISO/TS 14072, ISO 14040 e ISO 14044 y en importantes trabajos como el Greenhouse Gas Protocol (Ihobe, 2017).

En los últimos años han sido numerosas las organizaciones que han seguido algún tipo de procedimiento para el cálculo de la HAO, especialmente en sectores industriales como el energético, químico, alimentario, cosmético (Ihobe, 2017), textil (Resta *et al.*, 2016) o en el sector de la construcción (Martínez *et al.*, 2018). Por otro lado, las aplicaciones a organizaciones en el sector servicios son más escasas, por ejemplo, el sector hotelero (Martínez-Blanco *et al.*, 2016) o la actividad académica en centros de educación superior (Lo-Iacono-Ferreira *et al.*, 2018).

Este trabajo tiene como objetivo calcular la HAO de la actividad académica de la UPV/EHU utilizando la metodología ACV. El estudio se ha desarrollado en el contexto del proyecto EHU-Aztarna, que cuenta con un equipo multidisciplinar formado por personal docente e investigador (PDI), personal de administración y servicios (PAS) y alumnado de la UPV/EHU. En este trabajo se describen los resultados obtenidos en una primera modelización para los edificios I y II de la Escuela de Ingeniería de Bilbao (EIB) en el año 2016, considerando diversos flujos de entrada y salida, así como las necesidades de transporte de la comunidad universitaria. Se describen los impactos ambientales y sociales derivados de la actividad académica de la EIB.

2. Metodología

Siguiendo la guía propuesta por la Comisión Europea y facilitada por Ihobe (Ihobe, 2017), se ha llevado a cabo la modelización de los impactos ambientales y sociales de la EIB tomando como año base 2016. Sumando PDI, PAS y alumnado, la EIB cuenta con 5865 personas usuarias, lo que supone el 10,4% del total de la UPV/EHU (curso académico 2016/17). A continuación, se describe la metodología llevada a cabo en la recogida de datos y en la modelización.

2.1. Inventario: cuantificación de flujos de entrada y salida

Para la realización del inventario se han tenido en cuenta tanto los consumos (energía eléctrica, combustibles, principales consumos materiales) como la generación de residuos

(urbanos, peligrosos, de aparatos eléctricos y electrónicos, aguas residuales). Algunos flujos (electricidad, gas, agua, residuos peligrosos) se han cuantificado de manera sistemática. El resto han sido estimados a partir de los datos suministrados por los responsables de los servicios de mantenimiento, limpieza o de las propias instalaciones de la EIB, que cuenta con un Plan de mejora ambiental EKOSCAN, y de la UPV/EHU. Se ha considerado 2016 como año base (año natural: enero-diciembre), aunque para algunos flujos ha sido necesario considerar como unidad el curso académico (septiembre 2016-agosto 2017), o años posteriores.

En este trabajo también han estimado las necesidades de transporte derivadas de la actividad de la EIB. Para ello, se han utilizado los datos de la encuesta realizada por la Dirección de Sostenibilidad de la UPV/EHU a toda la comunidad universitaria en verano de 2018. Las principales conclusiones se recogen en el informe sobre el Diagnóstico de Movilidad de la UPV/EHU (Ingartek, 2018).

En la tabla 1 se resumen los conceptos incluidos en el inventario.

Tabla 1

Inventario de flujos de consumo de energía, consumo de materiales, generación de residuos y necesidades de transporte que soportan la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao (año 2016)

Concepto	Cantidad	Unidad
Electricidad	8,29	GWh
Gas natural	3,95	GWh
Gasóleo	113.694	litros
Agua consumida y derivada a saneamiento	23.718	m^3
Papel	29.703	kg
Lámparas fluorescentes	2.400	unidades
Tóners	277	unidades
Pilas y baterías	66	kg
Reposición de ordenadores de sobremesa y portátiles	605	unidades
Fracción resto de residuos urbanos	60.613	kg
Fracción papel de residuos urbanos	9.855	kg
Fracción envases ligeros de residuos urbanos	3.856	kg
Fracción vidrio de residuos urbanos	300	kg
Residuos de aparatos eléctricos y electrónicos	3.500	kg
Residuos peligrosos generados	6.176	kg
Necesidades de transporte	$41 \cdot 10^6$	p · km

Fuente: elaboración propia.

2.2. Modelización mediante openLCA

La modelización de los impactos ambientales y sociales derivados de la actividad de la EIB se ha realizado con el software libre openLCA (2016) y la base de datos Ecoinvent 3.3 (Ecoinvent, 2016), utilizando el enfoque *Cut-off* para la modelización del sistema, según el cual el productor de un material reciclable no recibe créditos (Ecoinvent, 2019). La modelización de los procesos que dan lugar a cada uno de los flujos inventariados se han seleccionado de entre los procesos disponibles en Ecoinvent realizando los ajustes pertinentes para adecuarlos al contexto de la EIB (mezcla eléctrica, eficiencias, localización).

Los impactos ambientales se han estimado utilizando los métodos de evaluación CML (Baseline) y ReCiPe. La metodología CML es una metodología *Midpoint* (clasificación y caracterización) que contempla 11 categorías de impacto significativas. Entre las categorías se incluyen, por ejemplo, potencial de calentamiento global, reducción de los recursos abióticos no renovables, toxicidad humana y oxidación fotoquímica (apartado 3.1, tabla 2). La metodología ReCiPe contempla tres categorías *Endpoint* (normalización y ponderación; en este estudio se ha utilizado la perspectiva *Jerárquica*), que muestran el impacto en tres niveles de agregación: efectos en la salud humana, en la biodiversidad, y en la escasez de recursos (apartado 3.1, tabla 2).

El análisis de impactos sociales se ha realizado mediante el *Social Impact Weighting Method* proporcionado por openLCA y Soca v.1 (Soca, 2017). Esta base de datos añade información social a Ecoinvent y permite combinar S-LCA y E-LCA (*Social and Environmental Life Cycle Assessment*) y LCC (*Life Cycle Costing*). La variable de actividad considerada para el cálculo de los impactos sociales son las "horas de trabajo" en cada uno de los procesos modelizados y en la actividad laboral de la EIB. Los resultados de la modelización de los impactos sociales son proporcionados en forma de "horas-riesgo" según diferentes niveles (desde inexistente a muy alto), que requieren un procesamiento posterior y una adecuada interpretación. De los 37 indicadores disponibles, agrupados en cuatro categorías (comunidad local, sociedad, cadena de valor y trabajadores), se han seleccionado siete significativos, tanto del impacto social directo de la actividad académica (accidentes, coste económico) como del contexto socioeconómico que la soporta (impactos indirectos, tabla 3 apartado 3.2). Los impactos sociales de actividad laboral en la UPV/EHU se han modelizado ajustando los indicadores disponibles en Soca para España al contexto de la Comunidad Autónoma del País Vasco (CAPV), y suponiendo una jornada laboral anual de 1500 horas y el coste laboral medio derivado de los presupuestos anuales de la UPV/EHU para 2016.

3. Resultados y discusión

3.1. Impactos ambientales

La tabla 2 recoge los impactos de la actividad académica de la EIB en las categorías de impacto *Midpoint* del método CML (Baseline) y las categorías *Endpoint* del método ReCiPe. Las siete categorías señaladas * han sido sometidas a un análisis desglosado según la naturaleza de los procesos involucrados y la localización geográfica de los impactos (figuras 1 y 2).

Tabla 2
Impactos ambientales derivados de la actividad de los edificios I y II de la Escuela de Ingeniería de Bilbao, para cada una de las categorías de las metodologías CML y ReCiPe

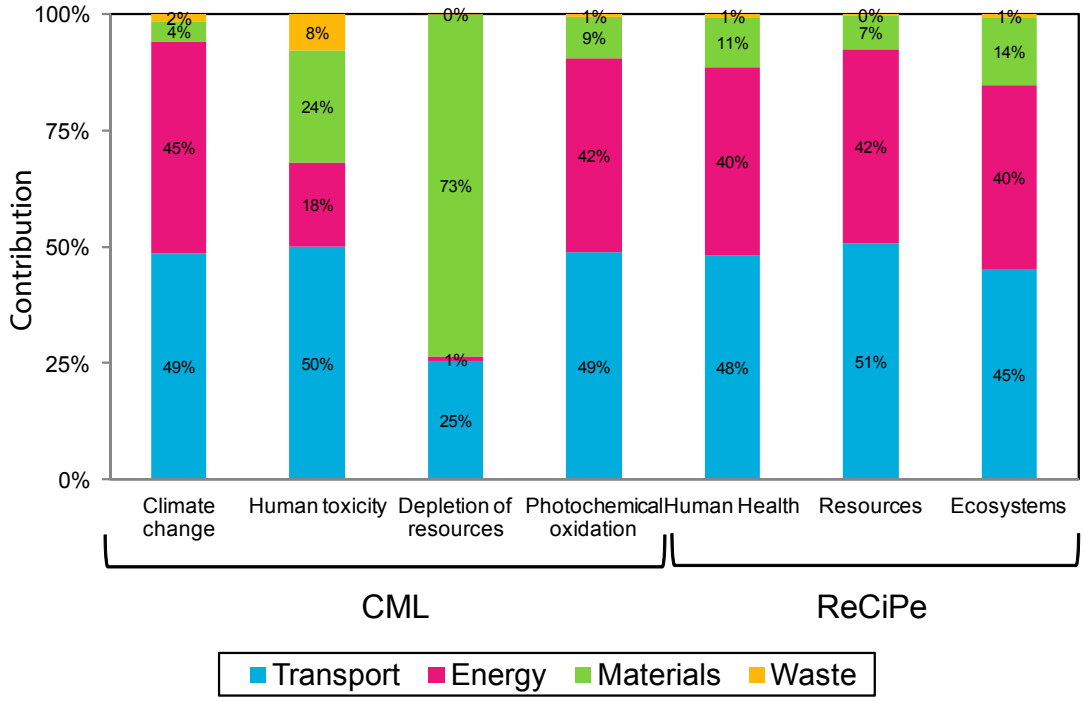
Método	Categoría de impacto	Unidad	Impacto	Impacto / usuario
CML	Terrestrial ecotoxicity	kg 1,4-dichlorobenzene eq.	$2{,}56 \cdot 10^{4}$	4,36
	Ozone layer depletion	kg CFC-11 eq.	0,84	$1{,}43 \cdot 10^{-4}$
	Climate change*	kg CO_2 eq.	$5{,}29 \cdot 10^{6}$	$9{,}02 \cdot 10^{2}$
	Photochemical oxidation - high NO_x*	kg ethylene eq.	1190	0,203
	Acidification potential	kg SO_2 eq.	$2{,}57 \cdot 10^{4}$	4,39
	Eutrophication	kg PO_4^{3-} eq.	7780	1,33
	Marine aquatic	kg 1,4-dichlorobenzene eq.	$1{,}48 \cdot 10^{10}$	$2{,}52 \cdot 10^{6}$
	Depletion of abiotic resources - fossil fuels	MJ	$6{,}97 \cdot 10^{7}$	$1{,}19 \cdot 10^{4}$
	Human toxicity*	kg 1,4-dichlorobenzene eq.	$3{,}47 \cdot 10^{6}$	$5{,}91 \cdot 10^{2}$
	Depletion of abiotic resources - elements, ultimate reserves*	kg antimony eq.	57,9	$9{,}87 \cdot 10^{-3}$
	Freshwater aquatic ecotoxicity	kg 1,4-dichlorobenzene eq.	$3{,}30 \cdot 10^{6}$	$5{,}63 \cdot 10^{2}$
ReCiPe	Human Health*	DALY (Disability Adjusted Life Year)	11,5	$1{,}96 \cdot 10^{-3}$
	Resources*	$	$3{,}01 \cdot 10^{5}$	51,3
	Ecosystems*	species·yr	0,0584	$9{,}96 \cdot 10^{-6}$

Fuente: elaboración propia.

La figura 1 recoge la contribución relativa del transporte, el consumo de energía, el consumo de productos materiales y la generación de residuos y su tratamiento, derivadas de la actividad académica de la EIB, en cada una de las siete categorías de impacto seleccionadas. En lo que respecta a las categorías CML, la satisfacción de las necesidades de transporte da lugar en torno al 50% del impacto total (entre 45 y 51%, según categoría), excepto en la categoría agotamiento de recursos abióticos (25%), ya que en ésta no se incluyen los combustibles fósiles. Es en esta última categoría en la que la contribución del consumo de materiales es mayor (73%), mientras que el aporte del consumo de energía es solamente de un 1%. En las restantes categorías, el consumo de energía contribuye entre un 18% (toxicidad humana) y un 45% (cambio climático). Exceptuando en la categoría agotamiento de recursos abióticos, el consumo de materiales (4-24%, según impacto) y la generación y tratamiento de residuos (<7%) son las actividades de menor contribución. En las tres categorías *Endpoint* de ReCiPe (salud humana, recursos y ecosistemas, figura 1) el transporte muestra una contribución similar en torno al 50%, la aportación del consumo de energía es del 40%, la del consumo de materiales ronda el 10% y la ligada al tratamiento de residuos es inferior al 1%.

Figura 1

Contribución relativa de las necesidades de transporte, consumo de energía y materiales, generación y tratamiento de residuos a categorías de impacto ambiental seleccionadas, derivadas de la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao

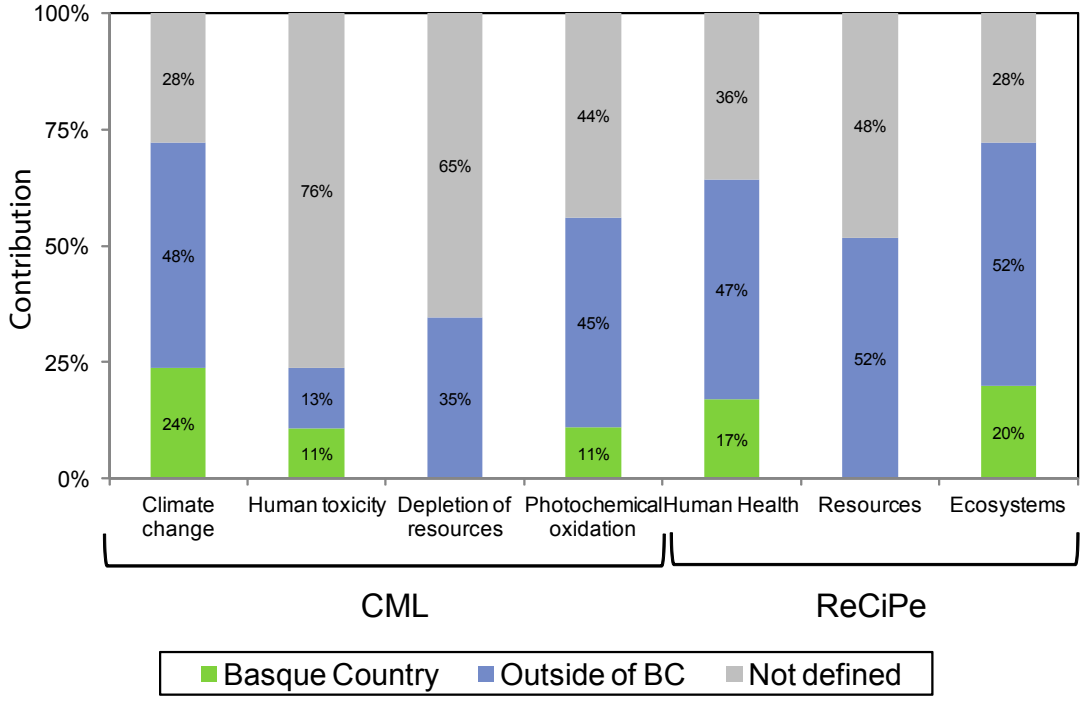


Fuente: elaboración propia.

La figura 2 muestra el análisis de la localización de los impactos ambientales derivados de la actividad académica de la EIB. Estos se han agrupado según estén localizados en la CAPV, fuera de la CAPV o aquellos cuya localización no está definida según la información disponible. Como cabía esperar, en las categorías relacionadas con el agotamiento de recursos, ningún impacto está localizado en la CAPV. Para el resto de categorías solamente una pequeña parte de los impactos están localizados en la CAPV: entre un 11% (toxicidad humana, CML) y un 24% (cambio climático, CML). Los impactos localizados fuera de la CAPV, según categoría, suponen entre un 13% (toxicidad humana, CML) y un 52% (Recursos y Ecosistemas, ReCiPe). Por último, debido a la incertidumbre asociada a la propia metodología, existen impactos cuya localización no está definida, con una contribución de entre el 28 y el 76% sobre el total.

Figura 2

Localización de las categorías de impacto ambiental seleccionadas derivadas de la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao



Fuente: elaboración propia.

3.2. Impactos sociales y económicos

En este apartado se describe el análisis de los impactos sociales estimados a partir de los resultados proporcionados por openLCA y Soca. Entre las 37 categorías de impacto social existentes, se han seleccionado las 7 categorías recogidas en la tabla 3 junto con su correspondiente valor numérico y una breve explicación y se han analizado según la naturaleza de los procesos involucrados y la localización geográfica de los impactos (figuras 3 y 4).

Tabla 3
Impactos sociales derivados de la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao para categorías seleccionadas

Categoría de Impacto		Valor	Descripción
Illiteracy	Indirecto	4,75%	Porcentaje promedio de población >15 años que no sabe leer o escribir correctamente
Pollution level	Indirecto	51,7%	Índice Numbeo (promedio de percepción subjetiva de polución, 0-100)
Gender wage gap	Indirecto	23,4%	Porcentaje de la brecha salarial entre hombres y mujeres
Child labour	Indirecto	2,62%	Porcentaje promedio de menores entre 7 y 14 años que realizan al menos una hora de actividad laboral a la semana
Fatal accidents	Directo	0,0795	Accidentes mortales/año
Non-fatal accidents	Directo	15,9	Accidentes no mortales/año
Costs	Directo	$34{,}3 \cdot 10^6$ €	Costes anuales

Fuente: elaboración propia.

Entre los impactos directos derivados de la actividad académica anual de la EIB se encuentran los accidentes, superando los no mortales (15,9 accidentes) a los mortales (0,0795 accidentes). El coste anual asociado a la actividad de la EIB es de 34,3 millones de euros, correspondiendo el 94% a la actividad laboral (figura 3). En esta estimación, sin embargo, no están contabilizados los costes externos por impacto ambiental. La internalización de los costes ambientales incrementaría significativamente el coste total de la actividad de la EIB.

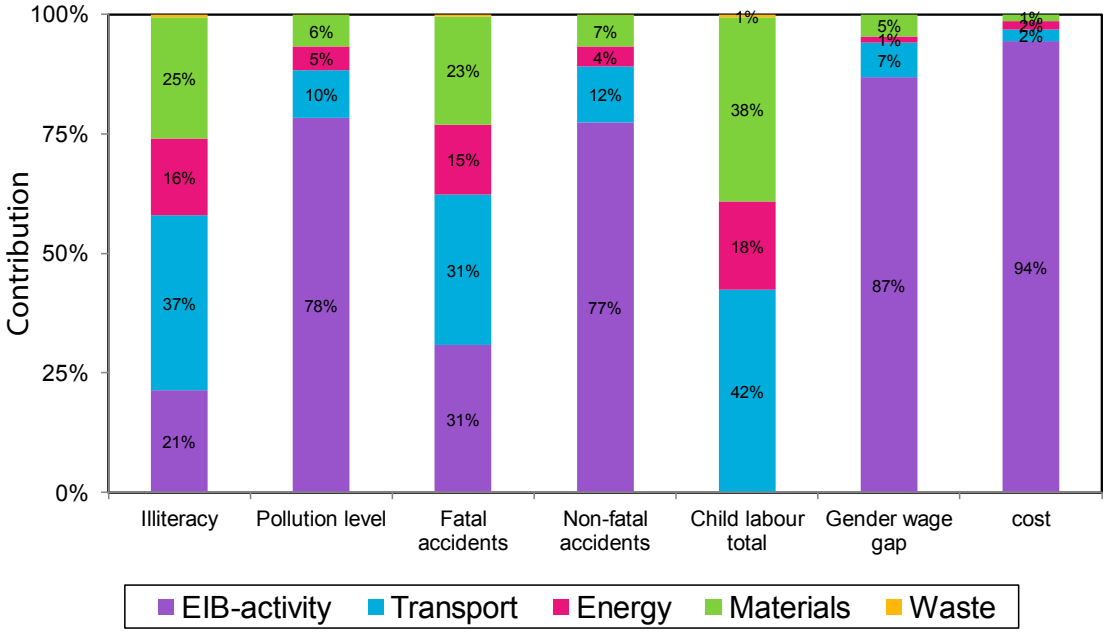
Este análisis permite caracterizar el contexto socioeconómico que da soporte a la actividad académica de la EIB, al considerar diversos impactos indirectos. Por ejemplo, el porcentaje de la brecha salarial entre hombres y mujeres es del 23,4%. En ese contexto socioeconómico que soporta la actividad académica de la UPV/EHU puede haber trazas de trabajo infantil, o de analfabetismo. Esto se debe a que parte de los procesos involucrados en el suministro de energía y materiales a la EIB se localizan en países con estas problemáticas. Por otra parte, el indicador de polución hace referencia a la percepción subjetiva de la población (51,7 sobre 100), y cuya localización en un 80% se sitúa en la CAPV (figura 4). Esta percepción subjetiva, por tanto, no se corresponde con la localización real de los impactos ambientales, la mayoría de ellos no ubicados en la CAPV (figura 2), y tampoco internalizados en los costes económicos.

En la figura 3 se muestra la contribución relativa del transporte, el consumo de energía y productos materiales, el tratamiento de residuos y la actividad laboral en la EIB a cada una

de las categorías de impacto social seleccionadas. Algunas categorías de impacto (contaminación, accidentes no mortales, brecha salarial de género y costes económicos) tienen su mayor contribución (77-94%) en la propia actividad de la EIB. En las categorías de impacto analfabetismo y accidentes mortales la actividad laboral contribuye un 21 y un 31% respectivamente. El resto de actividades tienen un aporte menor a los impactos sociales seleccionados: transporte (2-42%), energía (1-18%), materiales (0-38%) y tratamiento de residuos (<1%). Al ser nula la incidencia de la actividad laboral en la categoría trabajo infantil, se incrementan en esta categoría las contribuciones del transporte, materiales y energía.

Figura 3

Contribución relativa de la actividad académica, necesidades de transporte, consumo de energía y materiales, generación y tratamiento de residuos a categorías de impactos sociales seleccionadas, derivadas de la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao



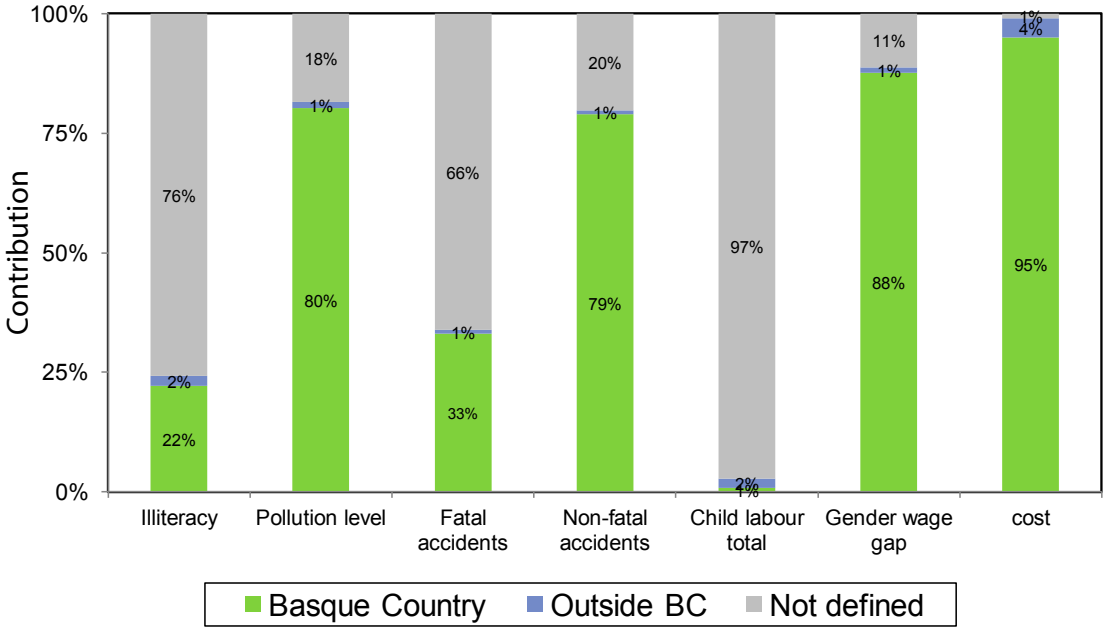
Fuente: elaboración propia.

La localización de los impactos sociales seleccionados se recoge en la figura 4. Las categorías de impacto social brecha salarial de género y percepción de polución están fuertemente ligadas a actividades socioeconómicas desarrolladas en la CAPV (88 y 80% respectivamente). La incidencia en la categoría trabajo de menores es nula, y del 22% en analfabetismo. La relevancia en la CAPV es igualmente alta en los impactos directos, al alcanzar el 95% de los costes, el 79% de los accidentes no mortales y el 33% de los accidentes mortales.

La modelización realizada permite evaluar posibles medidas y estrategias de mejora. A modo de ejemplo, se han analizado tres medidas concretas: el paso a un suministro de electricidad 100% renovable reduciría en un 24,6% el impacto en cambio climático y en un 28,9% la oxidación fotoquímica; el alargamiento del uso del equipamiento informático en dos años reduciría el agotamiento de recursos abióticos en un 14,2%; y trasladar la mitad del transporte realizado en coche privado al autobús reduciría el impacto en toxicidad humana en un 13,9%.

Figura 4

Localización de las categorías de impacto social seleccionadas derivadas de la actividad académica de los edificios I y II de la Escuela de Ingeniería de Bilbao



Fuente: elaboración propia.

4. Conclusiones

Los resultados indican que la contribución del transporte es cercana al 50% para la mayor parte de los impactos ambientales considerados, mientras que el consumo de energía, de materiales y el tratamiento de residuos presentan menores aportes. Una parte muy significativa de los impactos ambientales se localiza fuera de la CAPV. Respecto a los impactos sociales, destaca la contribución de la actividad laboral en la EIB. A diferencia de lo que ocurre con los impactos ambientales, la localización de los impactos sociales, tanto en relación al impacto directo de la actividad académica como a las actividades socioeconómicas que la sustentan, se localizan principalmente en la CAPV.

La reducción de los impactos ambientales y sociales de la actividad académica de la EIB exige, por tanto, actuaciones como las siguientes: reducir la necesidad de transporte y favorecer un sistema de movilidad más sostenible, por ejemplo, sustituyendo el coche privado por el autobús; reducir los consumos de materiales alargando la vida útil del equipamiento informático; o consumir electricidad de origen renovable.

Este trabajo pone de manifiesto el margen de mejora aún existente en la UPV/EHU de cara a conseguir una universidad más sostenible. El cálculo de la HAO es una potente herramienta para evaluar posibles medidas orientadas a la reducción de los impactos ambientales y sociales de la actividad académica, y puede ser de ayuda en un debate sosegado para avanzar en la sostenibilidad. El alineamiento de la UPV/EHU con los ODS 2030 hace vislumbrar un futuro en el que se trate de integrar plenamente la sostenibilidad en el ámbito de la educación superior. El proyecto EHU-Aztarna tiene la vocación de servir en esta tarea.

Agradecimientos

A la Dirección de Sostenibilidad (Vicerrectorado de Innovación, Compromiso Social y Acción Cultural) de la UPV/EHU en el contexto del programa Campus Bizia Lab (Convocatorias 2017/18 y 2018/19) por la financiación proporcionada al proyecto EHU-Aztarna / Modelización de impactos ambientales de la UPV/EHU mediante openLCA y Ecoinvent para el cálculo de la Huella Ambiental Corporativa.

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Campus Bizia Lab: a university of the Basque Country (UPV/EHU) programme aimed at working towards sustainability via a transdisciplinary approach based on cooperation

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Abstract

Campus Bizia Lab is a University of the Basque Country (UPV/EHU) programme arising from the Erasmus Project University Education for Sustainable Development (US4SD). It seeks to address the sustainability challenges at our university's three campuses by means of a transdisciplinary approach involving students, administrative and academic staff.

The programme consists of a research-action process aimed at developing a high-impact practice (HIP) on students (cross-cutting learning based on challenges concerned with sustainability) in which lecturers act as researchers into their own practices. This HIP is curricular in nature, and is handled via final year projects for bachelor's degrees (TFG) and masters' courses (TFM).

These challenges, which were defined by the Campus Bizia Lab community in a seminar, include Energy Transition, Circular Economy, Waste Management, Mobility and Urban Planning, Culture and Sustainability, Responsible Production and Consumption, Healthy Eating and Education for Transformation.

Campus Bizia Lab began to operate during the 2017/18 academic year, after a pilot scheme conducted the previous year. In the first edition, 178 people (84 women and 94 men) from over 10 different faculties (including Engineering, Education, Science, Economics and Business and Fine Arts) participated in 18 projects. A second edition has recently commenced for the 2018-19 academic, in which 27 people (17 women and 10 men) from various groups working on four new projects have joined the programme.

1. Introduction

The Campus Bizia Lab (CBL) programme is an initiative arising from the Erasmus University Educators for Sustainable Development Project [1] in which the UPV/EHU took part between 2013 and 2016. It seeks to trigger a transdisciplinary and collaborative process between students, research and academic staff (PDI) and services and administrative staff (PAS) to advance in the sustainability of the campuses of the University of the Basque Country (UPV/EHU).

This programme is being run at the initiative of the Vice-Chancellor's Office for Innovation, Social Outreach and Cultural Action of the UPV/EHU and led and organised by the Sustainability Directorate. CBL is significantly in line with the UN 2030 Agenda for Sustainable Development [2], along with the priority lines of the 2018/2021 Strategic Plan [3] and the IKD Cooperative and Dynamic Teaching and Learning Model [4] of the UPV/EHU.

By using the campuses as learning laboratories, the CBL programmes offers the university community the opportunity to work collaboratively on projects that address real problems that are related to the sustainability of the university itself. Thanks to this transdisciplinary approach, synergies are created that generate integrating and

innovative approaches that are applied to solve these highly complex and topical problems. Furthermore, CBL seeks to foster the development of a high-impact practice for the students with curricular recognition and it is achieved by means of the End-of-Degree Projects (TFG) and Master's dissertations (TFM).

The specific objectives of the CBL Programme are to:

— Plan, implement and assess sustainable practices for the University itself at the different university centres and campuses of the UPV/EHU.
— Foster skills acquisition and empower the university community to contribute to the co-creation of a more sustainable future.
— Design, develop and assess a work mechanism that enables high impact learning processes linked to sustainability within the UPV/EHU campuses to be successfully implemented.
— Showcase this institutional project in the sphere of sustainability and, in a phased manner, extend its radius of action to all the university centres and spaces of the UPV/EHU and generate multilevel sustainable practices.
— Coordinate an open debate on sustainable development at the UPV/EHU.

2. Methodology

The work process takes place at three levels:

— The facilitator group of the Campus Bizia Lab Programme, consisting of an external expert, three lecturers, two service and administrative technicians and academic staff of the Educational Advisory Service at the UPV/EHU. This group is tasked with establishing the institutional relations/conditions, facilitating the action/research profess and advising on the process.
— The PAS and academic staff group, which reflects on the strategy to be followed, on the design and adaptation of the challenges to the learning needs of students, tutorials, and on supervising and assessing TFG and/or TFM.
— The students taking part in the Campus Bizia Lab Programme, distributed in the three campuses and on different undergraduate and Master's degrees.

During the 2016/17 academic year, a pilot scheme was developed which was formalised in a call that has been held twice as of the time of writing, for the 2017/18 academic year and 2018/19 academic year. The process, even though with slight modifications made according to the experience and suggestions of the participants, has been repeated in the three editions:

— Prior to the start of the academic year, an initial seminar to introduce the general idea of the project and reflect on the following questions: What is a challenge in terms of sustainability? What are it components? What conditions must the challenge meet to combine it with the learning of the students? What challenges can be posed from the sphere of influence of each participant? What do those challenges/problems need for them to be embodied in a TFG or TFM? How can transdisciplinarity between the projects come into play? What stakeholders must take part? What role would each stakeholder play? What is required to advance the project in organisational terms (advice, training, technical support,…)? Photographs of those seminars are in Figure 1.

Figure 1
Photographs of the seminar of the pilot scheme and of the 1st edition

— Defining and specifying the projects on which to work within the challenges established by the programme. The challenges of the CBL programme are shown in Table 1. Furthermore, the initial PAS and academic staff task force was set up in this second stage.

Table 1
Challenges of the CBL programme

Challenge	Description
Energy transition	Actions aimed at minimising energy consumption and fostering the use of renewable energies, among others.
Circular Economy	Actions aimed at fostering the responsible use of natural resources, encouraging reuse, recycling and other forms to recover and manage waste, responsible purchasing and driving the modification of non-sustainable consumption habits, among others.
Allotments	Actions aimed at creating and using university allotments as an educational resource and learning environment to facilitate education processes for the change towards sustainability.
Mobility and urban planning	Actions aimed at fostering the use of carbon-free (bicycles) or public transport, at improving the spatial distribution and the balanced distribution of the activities at the campuses, and to contribute to increasing the quality of life of the campuses, among others.
Healthy university	Actions aimed at promoting healthy eating and lifestyles, supporting food sovereignty and security, and creating facilitator healthy and work environments, among others
Culture and sustainability	Actions aimed at advancing knowledge of the perception of sustainability by the university community, driving environmental volunteering and exploring their applications and exploiting culture as a facilitator of sustainability and part of the identity (cultural heritage and creative culture), among others.
Education for transformation	Actions aimed at developing a committed, responsible and critical citizenry, at promoting solidarity and diversity, inclusion, gender equality and interculturality to transform the current reality, among others.

— Design of the TFG and TFM projects and offers to be developed in the framework of the different projects, along with selecting students. Once the students are recruited, the task force is already available. They agree the actions to be carried out and their time line. Furthermore, they sign a participation undertaking within a month and which sets out the principles and responsibilities of each of the parties.
— Implementing and monitoring the projects. During the academic year, two coordination meetings are held: one of the meetings is intracampus in order to foster synergies between the projects of the different campuses (Álava, Bizkaia and Gipuzkoa) and the second is plenary, offering training and reflection on methodological and theoretical aspects about certain areas of common interest for all the projects.
— Presentation of the project progress in a closing plenary session at the end of the academic year. Furthermore, the challenges of the coming academic year are defined in this session.
— Diffusion. All projects result in the following deliverables: report, presentation and applications such as conceptual designs, demonstration, installation, prototypes, videos etc.

Moreover, a page has been set up for each project on the website of Directorate for Sustainability to disseminate results and facilitate synergies with projects on the Campus Bizia Lab programme. Additionally, October 2018 saw the organising of the 1st Congress of UPV/EHU Students under the title "Our work serves to change the world", in which student participants on the programme presented their Bachelor's end-of-degree projects on their experience and the ensuing results.

3. Results

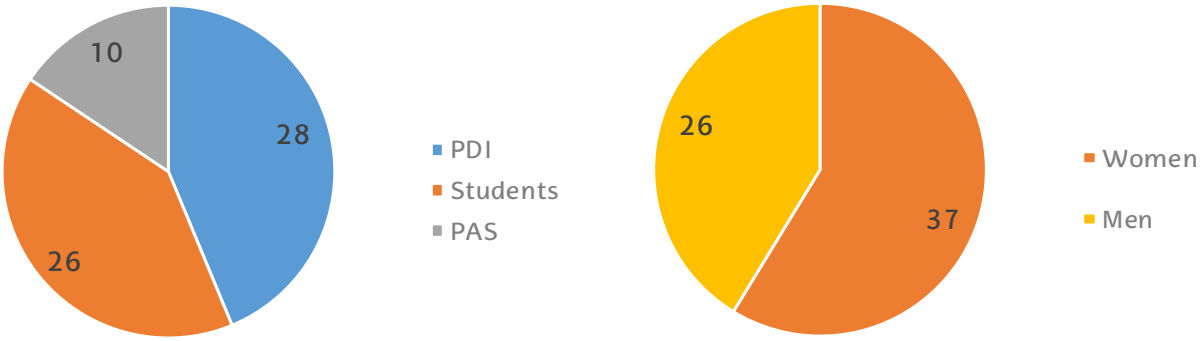
Over 300 people have taken part in the programme since it started in 2016. Sixty-three people working on 8 projects took part in the CBL pilot scheme during the 2016/17 academic year. Table 2 sets out the title and the centre from which the project was coordinated.

Table 2
List of CBL projects implemented in the pilot scheme of the 2016/17 academic year

Project title	University centre
Managing organic matter at the organic allotment on the Álava Campus	Education & Sports Faculty
Carbon footprint and water footprint at the Vitoria-Gasteiz School of Engineering	Vitoria-Gasteiz School of Engineering
Health: sustainable food and promoting healthy habits	Pharmacy Faculty
How to generate activation process in people and in contexts to change our daily routines towards responsible and fair consumption: experience with e-billing	Bilbao Education Faculty
Designing a participatory communication campaign to achieve energy savings at any university centre	Social Sciences and Communication Faculty
Food waste at the Hotel Management School	Science and Technology Faculty
Increasing energy and energy services sustainability at the Economics and Business Faculty	Economics and Business Faculty
Designing and setting up an organic allotment at the Gipuzkoa Campus	Gipuzkoa School of Engineering

Figure 2 shows the breakdown by group and gender. As can be seen, the participants are balanced in terms of gender and groups, with slightly fewer students than academic staff (PDI) and PAS taking part.

Figure 2
Number of participants in the CBL pilot scheme by collectives of the university community (left) and by gender (right)

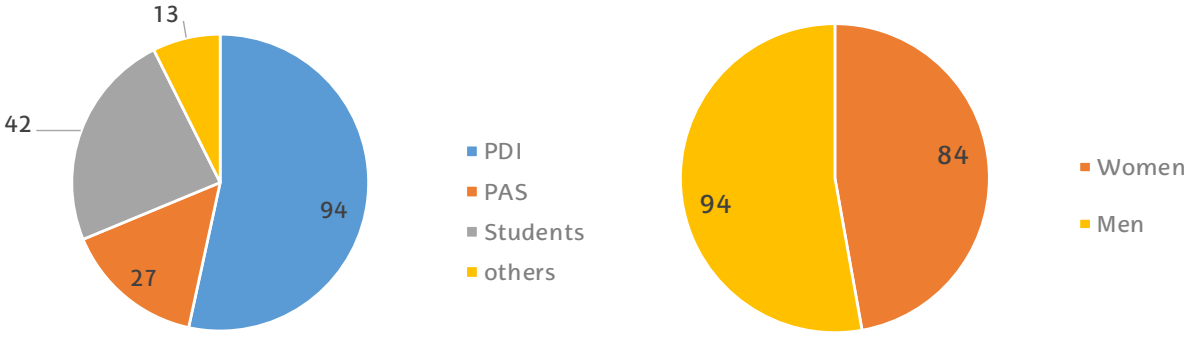


During the 2017/18 academic year, the number of projects increased significantly up to 18, along with the number of participants, which practically tripled up to 178. Table 2 sets out the title and the centre from which the project was coordinated and Figure 3 shows the breakdown by group and gender. Special mention should be made of the proportion of PAS participating in the programme, with respect to the pilot scheme.

Table 3
List of CBL projects implemented in the pilot scheme of the 2017/18 academic year

Project title	University centre
Interdisciplinary and collaborative teaching practice at the Álava Campus Organic Allotment (HECA)	Education & Sports Faculty
Use of resources: sustainable and responsible procurement of chemical reagents	Vitoria-Gasteiz School of Engineering
Modelling and analysis of social impacts linked to the UPV/EHU Corporate Environmental Footprint, by means of SOCA, openLCA and Ecoinvent.	Economics and Business Faculty
Food supply and consumption at the UPV/EHU: fostering a healthy environment	Pharmacy Faculty
Modelling the UPV/EHU environmental impacts by means of openLCA and Ecoinvent to calculate the Corporate Environmental Footprint	Bilbao School of Engineering
Emissions and resource use inventory compilation to calculate the UPV/EHU Corporate Environmental Footprint	Gipuzkoa School of Engineering
Project to set up an urban allotment at the Gipuzkoa Campus: a tool for community and curricular sustainability	Faculty of Education, Philosophy and Anthropology
Strategies to drive the responsible management of laboratory substances and materials at the Bizkaia Campus	Science and Technology Faculty
Strategies to minimise waste at the Bizkaia Campus	Science and Technology Faculty
Creating a transdisciplinary community towards the energy transition at the Bilbao Education Faculty	Bilbao Education Faculty
Use of renewable energies in different buildings of the University	Gipuzkoa School of Engineering
Developing Social Skills in Sustainable Decision making: a simulator for Economics & Business and Social Education	Economics and Business Faculty
The university as a social transformation driver. Actions to involve students, academic and administration & services staff to achieve the Sustainable Development Goals.	Economics and Business Faculty
Applying cryogenic refrigeration to substitute conventional mineral oil emulsions	Bilbao School of Engineering
Measuring environmental factors by means of open hardware	Bilbao School of Engineering
Sustainable assessment of natural fibres to design the manufacturing of construction component potentially used on the university campus	Bilbao School of Engineering
Sustainability of resources and cultural habits	Economics and Business Faculty
Optimising wind turbines: proposals to improve power and proposals for alternative construction materials	Vitoria-Gasteiz School of Engineering

Figure 3
Number of participants in the first CBL pilot scheme by collectives of the university community (left) and by gender (right)



During the current academic year, 2018/19, 16 of the projects of the previous call have requested and been awarded an extension for a further academic year. Furthermore, the four projects listed in Table 4 were submitted. This means that 37 participants, 17 of whom are women and 10 men; have joined the scheme. The figure and characteristics of the participating students are still not available.

Table 4
List of new CBL Projects in the 2nd edition

Project title	University centre
ZU2RAUNKORRAK. Sustainable bridges between the science culture and humanities culture at the Gipuzkoa Campus	Faculty of Education, Philosophy and Anthropology
Setting up a school allotment at the Bilbao Education Faculty	Bilbao Education Faculty
Transforming realities: University and Community cooperating in order to humanise education by means of the Learning-Service in the End-of-Degree Projects	Education & Sports Faculty
Art for energy transition	Fine Arts Faculty

Thus, CBL has been seen to formalise strategic partnerships with UPV/EHU faculties and schools as well as community partners to support shared interests in sustainability.

Additionally, the outcomes of the majority of CBL projects have been implemented or influenced decision making around ecological, social and economic sustainability on campus.

The benefits for the different collectives have included:

— Students: Earn course credits, put research into practice, develop professional skills, and contribute to advancing sustainability;
— Academic staff members: provide students with authentic, hands-on learning experiences, and integrate real-world sustainability challenges into the classroom;
— Administrative staff: Engage academic staff and student expertise for their sustainability projects and challenges, tap into academic creativity, mentor students, and collaborate with other departments and centres.

4. Conclusions

The CBL programme was launched in 2016 in order to create a transdisciplinary community working cooperatively and collaboratively to pinpoint and solve sustainability problems and challenges detected at the university itself. After a pilot scheme and two editions of the CBL Programme, the following has been achieved:

- Setting up of a community of academics, service administration staff (PAS) and students that are specifically involved in education for sustainable development at the UPV/EHU. The origin (university centre) and background (training) of the participants is very diverse.
- Realisation in each academic year of at least 30 TFG or TFM linked to different qualifications at the three UPV/EHU campuses.
- Promoting projects that showcase the UPV/EHU as an active agent of change for sustainable human development, and with an educational approach that is not limited to knowledge transfer, but rather develops the capacity of people for a transformative change towards sustainability. Those projects are available at: https://www.ehu.eus/es/web/iraunkortasuna/campus-bizia-lab-proiektuak
- Preparing organisational operating protocols and support materials for supervising and tutoring the TFG and TFM in sustainability.

However, there are aspects where there is a considerable margin for improvement. The greatest challenge lies in overcoming the obstacle of the fragmentation existing both between the university disciplines and between the groups that make up the university community and their relationship with the services. Another aspect that is both a difficulty and an opportunity would be creating good communication between the PAS and academic staff in the teaching-learning sphere.

Acknowledgments

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Zehargaituz: gure esperientzia "iraunkortasuna eta gizarte-erantzukizuna" zeharkako gaitasun bezala lantzen metodologia aktibo eta kolaboratiboak erabiliz

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Laburpena

Gure talde-lana 2009/11 urteko Hezkuntza Berrikuntza Proiektu (HBP) batekin hasi zen, Giza Nutrizioko eta Dietetikako (GND), Elikagaien Zientzia eta Teknologiako (EZT) eta Farmaziako zazpi irakasgaitako ikasleek era aktibo-kooperatiboan elikadurari buruzko hitzaldiak emateko erronkari aurre egin ziotenean. Hitzaldiak giza talde desberdinei zuzendu zitzaizkien, hala nola hirugarren adinekoei, umeei etab. Jarduera horrekin ikasleek beren ikasketa prozesua hobetu zuten eta zeharkako gaitasunak garatu zituzten. Esan beharra dago zeharkako gaitasunak ez zirela espezifikoki eta orokorki lantzen graduetan zehar.

Ondorengo urteetan zehar, ordea, zeharkako gaitasunek (ZG) gero eta garrantzi handiagoa irabazi zuten, eta gure taldeak GrALa identifikatu zuen ZG garatzeko irakasgai gako gisa. Hori dela eta, 2012/14ko HBPan, GrALean ZG lantzeko metodologia aktibo-kooperatiboa diseinatu genuen. GNDko, EZTko eta Ingurumen Zientzietako ikasleek hartu zuten parte eta MoodleTIC tresnaren bitartez gidatu genuen metodologia. Garatu zituzten ZGen artean eztabaida gaitasuna, iritzi kritikoa edo ahozko komunikazioa izan ziren nabarmenenak. Proiektu honi esker ikasleen ikasketa prozesua hobetu zen. Gainera, izandako esperientzia oso ondo baloratu zuten eta hurrengo ikasturteetarako gomendatu zuten.

Pixkanaka, unibertsitatea, gizarte erantzukizunean sustatzen dituen ekimenekin bat, taldearen lana iraunkortasunaren inguruan zentratuz joan zen. Alor hau aztertzen hastean, bere garrantzi eta konplexutasunaz jabetu ginen eta graduan landu beharra zegoela ohartu ginen. Horregatik, 2015/17ko HBP adituan ikaskuntza-irakaskuntza prozesuan iraunkortasuna eta gizarte erantzukizuna ZG bezala lantzeko estrategiak martxan jarri genituen. Lehenik eta behin, gaitasuna bera definitu genuen, hala nola ikasketa-emaitzak mailakatzea eta zehaztea. Gero, metodologia aktibo-kooperatiboak diseinatu genituen, baita irakasleak egin beharreko ebaluaziorako irizpide eta tresnak ere, ikasleen autoebaluaziorako egokiak direnak. Zehazki GNDko 8 irakasgaitan, 10 irakaslek eta 100 ikaslek baino gehiagok parte hartu zuten.

Gaur egun, Graduan "iraunkortasuna eta gizarte erantzukizuna" ZG honen garapenean diharduGu, eta era kooperatibo, aktibo, koordinatu eta mailakatuan lantzen saiatzen ari gara. Irakasleen, ikasgaien eta ikasmailen arteko koordinazioa lortu nahi dugu gaitasuna mailaz maila landu ahal izateko. Gure hurrengo erronka graduan lehenengo mailan sartzen diren ikasle berrien ibilbide osoa aztertzea da, hasten direnetik amaitzen duten arte, gaitasuna era osoan lantzen dela ziurtatzen duen metodologia hobetuz.

Abstract

Our work on cross-curricular skill (CCS) development started with an Innovative Education Project (IEP) in 2009/11, when students from 7 subjects of Human Nutrition and Dietetics (HND), Food Science and Technology (FST) and Pharmacy worked actively-cooperatively to face the challenge of giving talks about healthy diet in different social areas (schools, elderly centers...). This activity improved

student´s learning and helped them develop CCSs, in a moment in which those skills were not specifically addressed in the teaching plans.

Keeping up this path about CCS, our group identified the FYD as a course in which these competences are especially relevant. In a new IEP (2012/14) we designed an active-cooperative methodology, through MoodleTIC, in which students from HND, FST and Environmental Sciences carried out their FYD. Ten lecturers and thirty students from the faculty took part. The development of CCS was achieved during the realization of the FYD, highlighting those aspects related to arguing, critical opinion or oral communication. The methodology improved student´s learning, they evaluated it very positively and recommended it for future.

Gradually, the team focused on issues of sustainability and social responsibility (sided with University politics regarding social responsibility). We detected the need to address this as a CCS in the degree and the complexity it implied. Thus, in an expertise-IEP (2015/17), we launched a strategy to promote the teaching-learning of students around sustainability and social responsibility. Eight subjects of HND, 10 lecturers and more than 100 students took part. Sustainability and social responsibility were addressed as a CCS, working by a cooperative and dynamic perspective through active methodologies. We defined the competence, designed the activities, as well as the criteria and tools for their evaluation (lecturers) and self-evaluation (students).

Our current and future work line focuses on the development of sustainability and social responsibility as a CCS in an active, cooperative, coordinated and progressive way throughout the university degree. Our next challenge is to follow the trajectory of new students from the first year to the end of the degree, seeking to improve our methodology to achieve the global development of the competence in the degree.

1. Taldearen aurkezpena

"Zehargaituz" lan taldea Euskal Herriko Unibertsitateko Farmazia Fakultateko hamaika irakaslek osatzen dugu eta elkarlanean dihardugu 2009. urtean lehendabiziko HBPa lortu genuenetik. Hasieratik gure helburua irakaskuntza-ikaskuntza prozesua ikasleek zeharkako gaitasunak garatzea izan da, eta, horretarako, Farmazia Fakultateko titulazio desberdinetako ikasleekin lanean aritu gara ordutik. Ikasleen ikasketa prozesuak duen garrantziaz jabetuta gauden irakasleak gara eta horregatik Euskal Herriko Unibertsitateak eskainitako ikastaro, proiektu eta jarduera desberdinetan parte hartu dugu, hala nola ERAGIN eta DOITU irakaskuntza-metodologia aktiboetan trebatzeko ikastaroetan. DOITU programaren kasuan, gainera, taldeko partaide batzuk tutore ere izan dira. 2009. urtetik gaur egun arte bi HBPren eta bi «HBP adituak»en onuradun izan gara. Horrez gain, unibertsitatearen IKD Irakasle Talde Egituratuaren aipamena ere lortu genuen 2018. urtean (IKD: Ikasketa Komunikatiboa eta Dinamikoa). Taldeko partaide guztiok gure irakaskuntza jardueraren aldeko ebaluazioa jaso dugu Dozentiaz programan, eta partaide batzuek Dozentiaz programako ebaluatzaile izateko ikastaroa ere egin dute. Bestalde, irakasgai eta kurtso desberdinetako eta graduko koordinazio lanetan ere jarduten dugu. Gainera, gure lana gradutik kanpo ere transferitzeko esfortzua egiten dugu, lehen eta bigarren hezkuntzan konpetentzia zientifikoa sustatzeko ekintzak egiten baititugu eta hezkuntzarekin erlazionatutako proiektu deialdietara ere aurkeztu baikara. Honen adibide da 2017. eta 2019. urteetan aurkeztu garen FECYT deialdia, Espainiako Zientzia, Berrikuntza eta Unibertsitate Ministerioak argitaratzen duena hain zuzen ere. Taldearen aurkezpena, ibilbidea eta lorpenak bere web orrialdean ikus daitezke: https://www.ehu.eus/es/web/foodres

2. Taldearen esperientzia graduan zeharkako gaitasunak lantzen

2009/11 deialdian jasotako HBP proiektu batekin hasi genuen gure lana. Proiektu hartan GNDko, EZTko eta Farmaziako zazpi irakasgaitako ikasleak lan talde desberdinetan elkartu

genituen, arlo anitzeko taldeak eratuz. Modu aktibo-kooperatiboan lan eginez, elikadurari buruzko hitzaldiak prestatu zituzten eta giza talde desberdinen aurrean aurkeztu zituzten: helduentzat gizarte etxeetan, haurrentzat eskoletan, adineko pertsonentzat egoitzetan, etab. Ikasle talde bakoitzari gure taldeko irakasle bat egokitu zitzaion tutore moduan. Tutorearen lana ikasleak gidatzea, jarduera zuzentzea eta ikasleei ebaluazio hezitzaile bat ematea izan zen. Proiektuan lortutako emaitzak oso positiboak izan ziren. Alde batetik, entzuleek oso nota altuz ebaluatu zituzten hitzaldiak. Bestetik, ikasleek jarduera oso ondo baloratu zuten eta lortutako kalifikazioak ere altuak izan ziren. Garai hartan, oraindik zeharkako gaitasunak ez ziren espezifikoki eta orokorki lantzen graduetan zehar, baina jarduera honi esker, ikasleen ikasketa prozesua hobetzeaz gain, zeharkako gaitasunen garapena gauzatu ahal izan zen. Gaur egun, proiektu hartako jarduera batek indarrean jarraitzen du: adibidez, adinekoen egoitzetan urtero ikasleek elikaduraren inguruan ematen dituzten hitzaldiak.

HBP hartako proiektua bera eta lortutako emaitzak aditzera eman dira. "*Lankidetasun-hezkuntza aktiboa zeharkako gaitasunak eskuratzeko: nutrizioa eta elikadura osasungarria unibertsitatetik gizartera hurbiltzen*" izenburutzat duen liburu atala idatzi dugu, Euskararen eta Etengabeko Prestakuntzaren arloko Errektoreordetzaren aldeko irizpena lortu ostean, UPV/EHUko Argitalpen Zerbitzuak datozen hilabeteetan argitaratuko duena. Horrez gain, nazio mailako hezkuntza berrikuntzaren inguruko kongresuetan lana aurkeztu da [1, 2].

2010. urtean, Bolonia prozesuari ekin zitzaionean, Europako unibertsitateentzako amankomuneko hezkuntza modeloa proposatu zen (European Higher Education Area: Goi-mailako Hezkuntzako Europako Esparrua.), zeinetan hezkuntza hobezina izateko ikasleen ebaluazio jarraitua eta gaitasunen garapen etengabea bermatu behar ziren. Horretarako, gradu bakoitzean kurtsoz kurtso garatu beharreko gaitasunen deskribapena egiteaz gain, gaitasun horiek lantzeko metodologien inguruko ikastaroak eskaini ziren. Gure taldeko kideek arlo honetako zenbait ikastaro egin zituzten, eta gaitasunak garatzeko helburua zuten metodologia aktiboetan hezi ginen. Hurrengo urteetan, metodologia horiek gure irakasgaietan ezarri genituen. Hala ere, Gradu Amaierako Lanetan, ikasleek gaitasun gorenak erakutsi behar dituztenean, ZGen garapenik gertatzen ez zela konturatu ginen.

2012. urtean eskatutako HBP berri bati esker, GNDko, EZTko eta Farmaziako gradu amaierako lanetan (GrAL) ZGak lantzeko metodologia aktibo-kooperatibo bat diseinatu genuen. Proiektuan gure taldeko 10 irakaslek eta 30 ikaslek hartu zuten parte. Behin ikasleak arlo anitzeko taldeetan multzokatuta, bakoitzak bere GrALaren gaia aurkeztu zuen, haren planteamendua, erabiliko zuen bibliografia, eta suertatzen zitzaizkion zalantzak taldeko ikasleekin kontsultatu zituen Moodletic baliabidearen bitartez. Ondoren, beste partaideek beren zuzenketak, ekarpenak eta kritikak egin behar zizkioten. Eztabaidak antolatu ziren, bai aurrez aurrekoak, baita online bidezkoak ere, eta ikasle bakoitzak GrALa egin bitartean hiru entregagai aurkeztu behar izan zituen. Proiektuari esker, tutoreak, ikasleak berak eta haren taldekideek egindako ebaluazio hezitzaile jarraitua sustatu ahal izan zen. Gainera, ZGak modu kontziente eta kontrolatuan garatu ziren; haien artean, eztabaida gaitasuna, iritzi kritikoa eta ahozko komunikazioa nabarmendu ziren. Proiektuak ikasleen ikasketa prozesua hobetu zuen eta erabilitako metodologia oso ondo baloratu zuten; ikasleen % 79k ondorengo ikasturteetarako ere proposatu zuen. Gaur egun, Farmazia Fakultateko zenbait irakaslek zuzentzen dituzten GrALetan, garatutako prozedura aplikatzen dute. Proiektu hartako metodologia eta emaitzak zenbait lanetan argitaratu dira. Alde batetik, nazioarteko hezkuntza aldizkari batean artikulu bat argitaratu da [3]. Bestetik, UPV/EHUko Argitalpen Zerbitzuaren laguntzarekin gida bat argitaratu dugu [4]. Azkenik, lortutako emaitzak nazioko eta nazioarteko Hezkuntza Berrikuntzaren inguruko kongresu ugaritan aurkeztu izan dira bai poster moduan baita ahozko komunikazio moduan ere [5, 6].

3. Iraunkortasuna eta gizarte erantzukizunarekiko interesa

Urteak pasatu ahala, gure lantaldea iraunkortasuna eta gizarte erantzukizunaren alorrean interesatzen hasi zen, eta gai honen inguruan lanean dihardu 2012. urtetik gaur arte. UPV/EHUko Berrikuntzaren, Gizarte Konpromisoaren eta Kulturgintzaren arloko Errektoreordetzaren lau proiektu lortu ditugu; horiei esker, iraunkortasuna eta gizarte erantzukizuna unibertsitateko langileen lan-esparrutan desberdinetan (ikerkuntzan, kudeaketan eta irakaskuntzan) lantzeko jarduerak aurrera eraman dira. Lehendabizi, jarraibide iraunkorrak bermatu genituen laborategian, eta, ondoren, departamentu osora zabaldu genituen. Prozedura hori jasotzen duen "Nutrizio eta Bromatologia arloaren Ingurumen-Jasangarritasuneko Prozedura" argitaratu dugu, eta kongresuetan aurkeztu ere [7, 8]. Bestalde, Vitoria-Gasteizko Udaletxeko Itu Berdera atxikita gaude, Farmazia Fakultateko Ingurumena Hobetzeko Taldeko partaide gara eta gai honen inguruko hezkuntza ikastaro ugari jaso ditugu. 2015. urtetik aurrera, graduetan iraunkortasuna eta gizarte erantzukizuna lantzeak duen beharraz jabetuta, zeharkako gaitasun gisa landu behar zela pentsatu genuen. Hau horrela izanik, 2015. urteko HBP adituak proiektuari esker GEDko graduko zenbait irakasgaitan gaitasun hau lantzeko jarduera kooperatibo eta dinamikoak diseinatu genituen. Proiektu pilotu bat izan zen eta bertan gure taldeko 10 irakaslek eta 100 ikasle baino gehiagok hartu zuten parte. "Iraunkortasuna eta gizarte erantzukizuna" ZGtzat definitu genuen lehendabizi, eta gaitasun hori metodologia aktiboen bitartez lantzeko jarduerak diseinatu genituen. Horrez gain, gaitasunaren ebaluaziorako (irakasleek) eta autoebaluaziorako (ikasleek) baliabideak diseinatu genituen. Gainera, «HBP adituak»ek eskatzen duen bezala, emaitza kontrastagarriak lortzeko inkestak diseinatu genituen. Modu horretan ikasleen ezagutza emaitzak eta iritziak jaso ziren. Datuak erabili eta argitaratu ahal izateko, Unibertsitateko Etika Batzordearen oniritzia eskatu eta lortu genuen.

4. Lehendabiziko emaitzak

Metodologien inplementazioa 2015-2016 eta 2016-2017 ikasturteetan egin zen. Lortutako emaitzen arabera, ikasleek gaitasuna ezagutu, ulertu eta barneratzea lortu zuten. Gainera, gaitasuna graduko irakasgaietan lantzearen garrantzia azpimarratu zuten, bere lanbiderako beharrezkoa ikusten zutelako eta ordura arte graduan landu gabeko zerbait zelako. Emaitzak ikusita, gaitasuna garatzeko ezarpen- estrategia gure taldearen lehendabiziko erronka bihurtu zen eta ondorengo urteetan horretara zuzendu genuen gure lana. Esperientzia pilotu hartan lortutako emaitzak kongresu ugaritan aurkeztu dira eta artikulu zientifiko bat argiratzeko asmoa daukagu [9-12]. Era berean, gaitasunaren definizioa eta proposatutako metodologia, jarduerak eta ebaluazio errubrikak biltzeko asmoz, gida bat idazten gabiltza. Gida hau, proiektuko beste emaitza guztiak bezala, Garapen Iraunkorraren alde Euskal Herriko Unibertsitateak Nazio Batuen Agenda 2030 delakoari (sustainabledevelopment.un.org) egingo dion ekarpenaren partetzat jotzen dugu.

5. Gaurko erronka: iraunkortasuna eta gizarte erantzukizunaren garapen mailakatu eta koordinatua ged-ko graduan

HBP adituak proiektuaren 2015eko, 2016ko eta 2017ko deialdiak ez ziren nahiko izan ikasleek iraunkortasuna eta gizarte erantzukizunaren inguruko ezagutzak nola eboluzionatzen zuen ikusteko. Hori dela eta, 2019-2020 deialdiko «HBP adituak»i esker, gaitasunaren garapen mailakatua landu nahi dugu. Irakasleak, irakasgaiak eta ikasturteak koordinatu

eta modu ordenatu eta progresiboan gaitasuna landu nahi dugu GNDko Gradu osoan zehar (1. irudia). Horretarako, graduko 8 irakasgaitan, lehenengo ikasmailan ematen direnetatik hasi eta azken ikasmailan ematen direnetara bukatu, metodologia aktibo-kolaboratzaileetan oinarritzen diren jardueren bitartez gaitasuna landuko dugu. Jarduera guztiek hari gidari bera dute, eta gaitasuna sakontasun gutxienetik (1. mailan) sakontasun handienera (4. mailan) lantzeko diseinatu dira. Inkestak balidatu ditugu, Etika Batzordearen luzapenaren oniritzia lortu dugu eta interbentzioaren diseinu zehatza garatu dugu; gaztelerazko ikasleen taldea kontrol taldea izango da. Interbentzio protokoloa, proiektuaren planteamendua eta dagoeneko lortutako emaitzak bi kongresutan aurkeztu ditugu [13, 14, 15].

1. taula. Iraunkortasuna eta gizarte erantzukizuna GNDko Graduan modu mailakatu eta koordinatuan lantzeko jarraituko diogun interbentzio plana:

1. irudia

Gaitasuna landuko den irakasgaien zerrenda, GNDko Graduko 1. mailatik hasita Praktika Tutelatuak eta Gradu Amaierako Lana burutzen den arte

Azken proiektu honekin ikasleen irakaskuntza-ikaskuntza prozesua hobetu nahi da; horretarako, ikerketan eta frogatutako esperimentazioan oinarritzen den irakaskuntza metodologia bat aurrera eramango da. Ziur gaude lortuko ditugun emaitzak baliagarriak izango direla, ez bakarrik etorkizunean lanean jardungo duten ikasle prestatuagoak hezteko, baizik eta beste irakasle batzuentzat baliagarriak izan daitezkeen emaitzak, esperientzia eta baliabideak sortzeko.

6. Eskerrak

Lan hau Euskal Herriko Unibertsitateko (UPV/EHUko) Berrikuntzaren, Gizarte Konpromisoaren eta Kulturgintzaren arloko Errektoreordetzaren lau Hezkuntza Berrikuntza Proiektuei esker gauzatu da (2009/11; 2012/14; 2015/17 eta 2019/20). Proiektu desberdinetan eta jarduera bakoitzean parte hartu duten irakasleei eta ikasleei eskerrak eman nahi dizkiegu.

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Communities of practice: Reinforcing the educational inclusion network through collaboration

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Abtract

In recent decades, increasing strength has been acquired by the different initiatives falling under the concept known as communities of practice. In this work, an explanation will be given of the development of an Educational Innovation Project (EIP). The EIP is implemented in the last years of the Degree courses taught at San Sebastian's Faculty of Pre-school and Primary Education, Philosophy and Anthropology, specifically referring to the Specialisation in Special Education. The objectives of the work are: 1) To explain the diversity included in the school community; 2) To work in collaboration with different social agents on the inclusive school process; and 3) To explain the best practices developed by social agents in order to deal with the current challenges of inclusive education and reflect on these. Said objectives totally converge in different key skills of Pre-school and Primary Education. The initiative had the participation of 120 students, 13 social agents from the sphere of education and 6 university professors (from the departments of Didactics and School Organisation and Developmental and Educational Psychology). During the initiative, groups of five or six students designed and made a short film with a maximum runtime of three minutes. To go about the task, they contacted a social agent, proceeding to research the subject and the work carried out by the agent before making a short film referring to a best practice included in their activity. The short films were then screened for two days and joint reflection was made of the reality of the inclusive school at a round table made up of the participants in the EIP. The results obtained in the last two years using quantitative and qualitative techniques demonstrate that both the students and the social agents positively appraised this innovative experience and that the initiative has a direct effect on achieving the key skills of the Degree studies. The intention is therefore in the near future to continue strengthening collaboration with different social agents while creating and consolidating communities of practice.

Laburpena

Azken hamarkadetan gero eta garrantzi handiagoa hartu dute praktiken komunitateak kontzeptupean ezagutzen diren ekimen ezberdinak. Lan honetan UPV/EHUko Hezkuntza Berrikuntza Proiektu (HBP) baten bilakaera ezagutzera emango da. HBPa Donostiako Hezkuntza, Filosofia eta Antropologia Fakultateak (HEFA) eskaintzen dituen Haur eta Lehen Hezkuntzako Graduetako azken ikasturteetan garatzen da, Hezkuntza Bereziko Aipuan hain zuzen ere. Lanak ondorengo helburuak ditu: 1) Eskola komunitateak barne hartzen duen aniztasuna ezagutzera ematea; 2) Eskola inklusiboaren bidean gizarte-eragile ezberdinekin lankidetzan aritzea; eta 3) Hezkuntza inklusiboak egun dituen erronken aurrean gizarte-eragileek garatzen dituzten praktika egokiak ezagutzera ematea eta horien inguruan hausnartzea. Helburu hauek guztiz uztartzen dira Haur eta Lehen Hezkuntzako Graduetako zeharkako hainbat konpetentziekin. Ekimenean 120 ikaslek, hezkuntza arloan diharduten 13 gizarte-eragilek eta unibertsitateko 6 irakaslek (Didaktika eta Eskola Antolakuntza eta Bilakaeraren eta Hezkuntzaren Psikologia Sailetatik) parte hartu dute. Bertan, ikasleek, bospasei kideko taldeak osatuz, gehienez hiru minutuko iraupena duen laburmetraia diseinatu eta grabatu dute. Zeregin hau burutzeko gizarte-eragile batekin harremanetan jarri dira eta hautatutako gaia eta gizarte-eragileak egiten duen lanaren inguruan dokumentatu ondoren, beren jarduna jasoko duen praktika egoki bati buruzko laburmetraia sortu dute. Ondoren, bi egunetako jardunaldi batean laburmetraiak proiektatu dira eta HBPko partaide guztiek osatutako mahai-inguruan, eskola inklusiboak duen errealitatearen inguruan elkarrekin hausnartu da. Azken bi ikasturteetan zehar teknika kuantitatibo zein kualitatiboak erabiliz jaso diren emaitzek adierazten dute

ikasle zein gizarte-eragileek ongi ebaluatzen dutela berrikuntza esperientzia hau eta Gradu ikasketetako zeharkako konpetentzien lorpenean eragin zuzena duela ekimenak. Hori guztia dela eta, etorkizun hurbilean gizarte-eragile ezberdinekin lankidetza sendotzen eta praktiken komunitateak sortzen eta gorpuzten jarraitzeko asmoa dago.

1. Sarrera

Delors-ek (1996) seinalatu bezala, unibertsitateek hiritarrak trebatu behar dituzte ezagutzen ikas dezaten eta ezagutza horiek etengabe eguneratzeko gai izan daitezen. Egiten ere ikasi behar dute, eta egoera ezezagunak gainditzeko gaitasunak barneratu enplegu-ahalmena areagotzeko. Azkenik, izaten ikasi behar dute, autonomia, zentzuzko bereizmen eta erantzukizun pertsonalaren bidea urratu eta patu kolektiboa mamitzeko gai izan daitezen. Hori guztia lortu nahi bada, ezinbestekoa da unibertsitateko irakasleen lan-moldeetan ere aldaketak ematea (talde lana, diziplinartekotasuna…) eta, eskola magistralak beharrean, irakaskuntza-ikaskuntza metodologia berritzaileak erabiltzea. Euskal Herriko Unibertsitateak (UPV/EHU) irakasleen etengabeko formakuntzarako Ikaskuntza Kooperatiboa eta Dinamikoa (IKD) izena duen eredua aintzat hartu izan du. Karrera, Zulaika eta Aldaz-ek (2014) adierazten duten bezala, eredu berritzaile honek aldaketa nabarmenak ekarri dizkio garaiko irakaskuntza kulturari. Eredu honen ikaskuntzaren muinean ikuspegi malgua aurkitzen da eta horrela titulazio edota unibertsitateko ikastetxe ezberdinen berezitasunak zaindu eta garatu ahal izateko. Era berean, zabaltzen duen metodologiak hezkuntzaren eremuan aurkitzen diren eragileen arteko koordinazioa eta elkarlana sustatu nahi du testuinguru dinamikoan. Horrela, IKD proposamena bat dator gero eta garrantzi handiagoa hartzen duen Praktiken Komunitatearen lan ildoarekin.

1.1. Zer dira praktiken komunitateak?

Praktiken Komunitatea, Etienne Wenger-ek 1998an sorturiko kontzeptua da. Wenger, McDemortt eta Snyder-ek (2002) horrela definitu zuten: kezka, ezagutza ala arazo multzo jakin baten inguruan biltzen den gizataldea izanik, haien arteko hartu-emana medio beren ezagutzetan eta trebetasunetan sakontzeko aukera ematen du Praktiken Komunitateak. Unibertsitateetako Irakasleen formakuntzara etorrita, Bozu eta Imbernon-ek (2009) Praktiken Komunitateek dituzten osagai komunen zerrenda egin zuten. Praktiken Komunitateen gako nagusiak honakoak izanik:

— Praktiken Komunitatean parte hartzen duten kideek ezagutza espezializatua dute (inork ez du ezagutza guztia alegia).
— Norberaren ezagutza konpartitzea beharrezkoa da. Horrela, hartu-eman honekin, hasierako ezagutza birmoldatuko da eta ezagutza berri bilakatuko da, kideen arteko kohesioa garatuz eta identitate berria sortuz.
— Lidergo partehartzailea dela medio ikaskuntza prozesua garatuko da.

Esandakoa kontutan hartuta, unibertsitatean Praktiken Komunitateak era honetan mugatuko dugu: Espezializatua den edota formakuntzan ari den diziplinarteko gizataldea (hau da, ikasle, irakasle, ikertzaile edota gizarte eragileen ordezkariez osaturiko lantaldea), interes komunek batuko dutena eta beren ezagutzan eta praktikaren gaineko hobekuntza bilatuko dutenak. Hau gauzatzeko, beren arteko elkarlanaz baliatuko dira, informazioa partekatzen eta hausnartzen, azken finean, ikasten jarraitzea izango delarik beren xedea.

1.2. Praktiken komunitateko esperientzia LHko Graduko Hezkuntza bereziko aipuan

1.2.1. *Testuingurua*

Hezkuntza, Filosofia eta Antropologia Fakultatean (HEFA) kokatzen den Hezkuntza Bereziko Aipuan, Europar Goi-mailako Hezkuntza Eremuak proposatutako ikaskuntza-irakaskuntza ereduak planteatzen duen erronkari eutsi nahian eta Horizon 2020 (H2020) programa markoak planteatutako gizarte inklusibo, berritzaile eta hausnartzaileagoa sustatu nahian, *Lankidetza: eskola inklusiboa eta gizarte-eragileak* izeneko proiektua sortu da. Hezkuntza Bereziko Aipuan irakaskuntza presentziala duen irakasle taldeak bat eginik, irakaskuntza-ikaskuntza magistralaren eta bakartuaren garaiak gainditzeko asmoz, metodologia aktiboetan oinarrituta dagoen 3,6 ECTS kredituko diziplinarteko proposamena luzatu zaie ikasleei. Proposamen hori, ikasleak euren ezagutzan, egiteko gaitasunetan eta izatean haratago joan daitezen diseinatua izan da, inguruan dituzten eta lankidetzarako prest agertu diren hamahiru gizarte-eragileekin elkarlanean. Finean, ikasleriak ikaskuntza prozesuan paper aktiboa izatea bilatzen da, unibertsitatea errealitatera hurbilduz eta gizartearekin konektatuz, benetako beharrei erantzuna eman nahian norberak bere beharrak ase ditzan.

1.2.2. *Helburuak*

Bizi garen ezagutzaren gizartean osagai kolektiboak gero eta presentzia handiagoa du. Hezkuntza Inklusiboak ez du ahaztu nahi hain garrantzitsua den osagai hau eta Hezkuntza Filosofia eta Antropologia Fakultateak (HEFA) eskaintzen duen Hezkuntza Bereziko Aipuan proiektu honen bidez martxan jarri nahi du gizarte eragileak, ikasleak eta irakasleak elkarlanean jarri dituen ekimena.

Honakoak dira bilatu diren helburuak:

1. XXI. mendeko hezkuntzak biltzen duen aniztasunari erantzuna emateko, eragile ezberdinen lana ezagutzea (gizarte-eragileak, eskolak, administrazioa).
2. Unibertsitatea eta gizarte-eragileen arteko elkarlana erraztea eta eskola inklusiboaren bidean gizarte-eragile ezberdinekin lankidetzan aritzea.
3. Hezkuntza inklusiboak egun dituen erronken aurrean gizarte-eragile ezberdinek hezkuntza eremuan garatzen dituzten praktika egokiak ezagutzera ematea eta horien inguruan eta horiekin batera (gizarte eragileen ordezkariekin batera) unibertsitatearen eremuan hausnartzea.

Helburu hauek guztiz uztartzen dira Lehen eta Haur Hezkuntzako Graduetako konpetentziekin.

2. Metodoa

2.1. Partaideak

Lan honetan 120 ikaslek, 6 irakaslek eta 13 gizarte eragilek parte hartu dute.

Haur eta Lehen Hezkuntzako laugarren eta azken ikasturteko Hezkuntza Bereziko Aipuko ikasleak dira. 106 emakumezko eta 14 gizonezko. 23 urteko batazbesteko adina dutenak.

Sei irakaslek parte hartu dute. Hiru irakasle Didaktika eta Eskola Antolakuntzako Sailan ari dira lanean, beste hiruak, berriz, Bilakaeraren eta Hezkuntzaren Psikologia Sailan. Sei irakasle horietatik hiru emakumezkoak dira eta beste hirurak gizonezkoak. Irakaskuntza unibertsitarioan eskarmentu handiko profesionalak izanik denak.

Gizarte eragileen multzoa, Gipuzkoan diharduten irabazi-asmorik gabeko erakunde eta fundazioek osatzen dute. Guztiak hezkuntzarekin elkarlanean ari dira gai edota problematika ezberdinen inguruan, hala nola: adopzioa, harrera, gaixotasun arraroak, jokabide desegokiak edota droga kontsomoa, autismoa, dislexia, gutxiengo etnikoak, adimen handiko ikasleak, etorkinak edota aniztasun sexuala. Zehazki, 2017/18 eta 2018/19 ikasturteetan proiektuan parte hartu duten gizarte-eragileak ondorengoak dira: Gizalde, Beroa, Apoyo Dravet, Gautena, Gehitu, Norbera, SOS arrazakeria, Alcagi, Jatorkin, Ume Alaia, Kaldedor Kayiko, Dislegi eta Pausoka.

2.2. Tresnak

Proiektuaren helburuen lorpen maila ebaluatzeko bide desberdinak erabili dira eta prozesu horretan, proiektuak barne hartzen dituen eragile guztiak aintzat hartu nahi izan dira. Proiektua 2017/18 eta 2018/19 ikasturteetan burutuko bada ere, komunikazio honetarako soilik 2017/18 ikasturteko emaitzak kontutan hartu dira, 2018/19 ikasturtea abian baita oraindik. Beraz, lan honetarako momentuz, erregistro kualitatiboak eskaintzen dituzten ondorengo iturriak aukeratu dira:

— 2017/18 ikasturtearen amaieran, Heziketa Bereziko Aipuan irakasgai presentzialak dituzten irakasleekin (6 irakasle) proiektuaren ebaluazio bilera egin zen, ondorengo gaiei buruz eztabaidatu zen: proiektuaren helburuen lorpen maila, mantendu beharreko alderdiak eta hobetu beharrekoak. Haien erantzunak erregistratuko dira landa oharrak eta bileren aktak eginez.
— 2017/18 ikasturtearen amaieran, Hezkuntza Bereziko Aipuko ikasle multzo batekin (7 ikaslekin) proiektuari buruzko eztabaida taldea osatu zen. Eztabaida talde hau, gizarte-eragile desberdinekin lankidetzan jardun diren ikasleek osatu zuten. Galdera irekiak egin zitzaizkien eta haien erantzunak audioz erregistratu. Besteak beste, ondorengoa galdetu zitzaien: proiektuaren bidez zer ikasi duzue? Ikasitakoa zertarako zaizue baliogarria? Nola hobetuko zenuke proiektua? Zein zailtasun izan dituzue proiektuan zehar?

Beraz, lan honetatik kanpo geratu dira momentuz:

— 2018/19 ikasturte amaieran, Hezkuntza Bereziko Aipuko ikasle guztiei pasako zaien galdera-sorta. Galdera-sorta hori, proiektuaren helburuen lorpen mailari buruzko datu kuantitatibo eta kualitatiboak biltzeko diseinatuko da.
— 2018/19 ikasturtearen amaieran, gizarte-eragileen ordezkaritza lagin bati (6 gizarte-eragile inguru) idatzizko galdeketa bat luzatuko zaio.

2.3. Prozedura

Duela bi ikasturte irakasgai bakar baten barne-proiektu gisa hasi zena, Aipuko irakasgai guztien arteko proiektu bilakatu zen 2017/18 ikasturtean. Irakasgai bakoitzaren ekarpenek eta ikuspegiak zeharo aberastu eta hornitu dute proiektua. Horretarako, 60 ikasleko taldea

12 azpi-taldetan zoriz banatzen da, eta, talde bakoitzak aukeratutako eta hezkuntza eremuan diharduen gizarte-eragile batekin kontaktuan jartzen da. Aipuko irakasleek aurretiaz gizarte-eragileekin kontaktua egina izaten dute eta haiek proiektuan parte hartzeko oniritzia emana izaten dute.

Ikasle taldeek zein gizarte-eragilekin lan egin nahi duten aukeratu ostean, haiek hobe ezagutzeko dokumentazio lanari ekin ohi diote: gizarte-eragile jakin horrek jorratzen duen gaiaren egoera Euskal Autonomia Erkidegoan, Hezkuntza Sailak edo eskolek egoera horri ematen dioten erantzuna, gizarte-eragileak hezkuntza arloan egiten duen lana, etab. Behin dokumentazio lana amaitzean, ikasleek gizarte-eragileekin izango duten elkarrizketa diseinatu eta prestatzen dute: elkarrizketaren gidoia, hitzordua eta lekua adostu, etab. Gizarte-eragileetako kideekin elkarrizketa egiten duten egunean, gizarte-eragileari eta haren lanari buruzko informazioa jasotzeaz gain, ikasleek gizarte-eragileari esan behar diote haien lanari buruzko hiru minutuko laburmetraia bat sortu behar dutela ikasturte amaierarako. Gizarte-eragileekin egindako bileraren ostean, ikasleak laburmetraia diseinatzen eta editatzen jardungo dira. Azkenik, amaieran, HEFAko Eraikin II-ko Areto Nagusian egingo diren bi mahai ingurutan, ikasleek laburmetraiak proiektatu eta horiei buruzko hausnarketa gidatuko dute. Mahai inguru horiek publikoari irekiak dira eta proiektuan parte hartu duten 12 gizarte-eragilek eta horiekin kontaktua egiten laguntzen duen Gizalde boluntariotza agentziako kidea bertara gonbidatuak egoten dira euren ikuspegia eman dezaten.

3. Emaitzak

Atal honetan ezagutzera emango dira bai irakasle taldearekin eta baita ikasleekin egindako ebaluazioak.

3.1. Irakasleen iritziak

2017/18 ikasturte amaieran, irakasle taldea bildu zen ikasturtea baloratzeko eta hurrengo ikasturterako behar ziren hobekuntzak proposatzeko. Hauek dira azaldu ziren ideia eta iritzi garrantzitsuenak eta bertan hartu ziren erabaki ezberdinak:

— Irakasleen arteko kontsentsua: proiektu honek irakasgaien arteko loturak sendotzea ahalbideratu du. Era berean, irakasleen arteko kohesioa ere garatzea lortu du. Beraz, aho batez erabaki zen 2018/19 ikasturtean zehar proiektuarekin aurrera egitea.
— Proiektuaren gida egin izanak laguntza handia suposatu du bai ikasleentzat eta baita irakasleentzat ere. Gainera 2018/19 ikasturtean irakasleen artean aldaketak eman daitezke, irakasle berriren bat sartu daiteke ekipoan alegia. Gidak lagundu dezake proiektua ezagutzen eta ulertzen. Ikasleentzat gida laguntza handiko tresna izan bada, bertan zenbait hobekuntzak jaso behar direla ikusten da. Hala nola:

  • Proiektuan zehar garrantzia gehiago eman behar zaio gizarte-eragileek ikastetxeekin gauzatzen duten elkarlanari. Baita ere argiago geratu behar da gizarte-eragileek zer eskatuko lekieten etorkizunean irakasle izango diren unibertsitateko ikasleei. Hori guztia laburmetraian bertan edo laburmetraien ekitaldian ezagutzera ematea komeni da eta laburmetraiak hezkuntza arlora bideratuagoak egon beharko lirateke.

- Ikasleen emangarriak proiektuaren gidan hobe zehaztu behar dira eta horietako bakoitzaren ebaluazioa ere. Emangarriak eta laburmetraia bera ere, hezkuntzarekin hobeto lotzeko indarra egin behar da. Gidan agertu behar du gizarte-eragileek egiten duten lana hezkuntzan.

— Ikasleek gizarte-eragileekin egiten duten elkarrizketak garratzi handia hartu du proiektuan. Hori horrela izanik, irakasle batek bere irakasgaiaren baitan, arlo horren lanketa sakonagoa bere gain hartzen du.
— Ikasleak, orokorrean, aurreko ikasturteetan baino lan egiteko gogo handiagoarekin sumatu dituzte irakasleek.

3.2. Ikasleen iritziak

Eztabaida taldean emandako elkarrizketa hau audioz grabatu zen. Hemen aurkeztuko da analisitik ateratakoa:

3.2.1. *Aurreiritziak*

Hasieran, beste edozein lan bezala kontsideratua izan bada ere, proiektua amaitu ondoren eta emaitzak ikusita hasierako aurriritziak zeharo aldatu dituzte:

> Hasieran kexuka hasi ginen pilo bat, guretzako plus bat zen, ez genuen ikusten alde positiborik lan honetan. Azkenean, bukatu genuenean kurtsoa, niri adibidez, iruditu zitzaidan kriston lan polita. Ezagutu genituen gizarte-eragileak, gurea gehien bat, baina beste gizarte-eragileak ere ezagutzeko aukera izan dugu. (*Neska ET_1.2.37*)

Edo besterik gabe bada ere, zenbait kolektiboengan izkutuan ditugun aurritziak gainditzeko:

> Gero baita aurriritziak kentzeko, gizarte-eragileekin egindako lanari esker, ijituekiko dugun ikuspegia guztiz aldatu dela alegia, nire kasuan behintzat horrela iruditzen zait. Nola bizi duten ikusten duzunean. *(Neskak ET_1.23.33*)

3.2.2. *Azpimarratzekoa*

Proiektuko momentu ezberdinak baloratu izan dira baina zerbait azpimarratzekotan, da gizarte-eragileen ordezkariekin egindako elkarrizketak eta azken ekitaldia baloratu dira:

> Niri gustatu zaidana da elkarrizketa prestatzea eta gero praktikan burutzea. Hori garrantzitsua ikusten dut gero etorkizunean irakasleen artean da zerbait askotan egiten dena eta gero praktikara eramatea bah… ondo ikusten dut. *(Mutila ET_1.8.29*)

> …gero igual ekitaldiaren egunean ere, igual zuek lan egin zenuten beraiekin zuzenean baino besteek igual beste gizarte-eragile batzuk genituen igual, hori, denak, egin genuenean jardunaldiak bi egun horietan, laburmetraiak ikusi eta gero ere sortu ziren ikuspuntuak eta eztabaidak niri gustatu zaizkit, esperientzia trukaketa. *(Neska ET_1.24.03*)

Ikasitakoaren balioa ere azpimarratu nahi izan dute:

> Gaian sakondu baino honek trebatu gaitu laguntza eskatzeko momentuan. Erakundeetara jotzeko momentuan orain erraztasun handiagoa dugu. Baita ere aniztasun horren inguruan sentsibilizatzeko ondo etorri da. Ikastetxeetan eta gizartean zein zailtasun ala zein egoera dauden ikusten laguntzen du. Etorkinak ala ijituak… *(Neskak ET_1.19.59*)

3.2.3. *Hobekuntza proposamenak*

Irakasgai bakoitzak proiektuari eskaini dion ordu banaketan hobekuntzak egin behar direla aipatu dute:

> Iruditu zitzaigun laga zitzaizkigula klase ordu asko proiektuaren atal teorikoagoa egiteko baina gero laburmetraia egiteko falta zitzaizkigun klaseak. *(Neska ET_1.9.33*)

Proiektuari amaiera emateko gizarte-eragileen ordezkariekin batera egin izan diren jardunaldietara agenda kontuak direla eta gizarte-eragileen heren bat ez zen gerturatu. Ikasle batek aspektu hori azpimarratzen du:

> Nik proposatuko nuke gizarte-eragileak, ahal duenak behintzat etortzea jardunaldira zeren oso gutxi etorri ziren. Niri iruditu zitzaidan gutxi etorri zirela. Ulertzen dut ezin baldin bada ezin dela baina… bere aldetik laguntza bat dela aurkezpenerako iruditzen zait. *(Neska ET_1.7.05*)

4. Ondorioak

Aurkeztu dugun esperientzia arrakastatsua izateaz gain, irakaskuntzan ari garen profesionalentzat, ia ohartu gabe, laguntza handiko baliabide gisa suertatu zaigun proiektua da. Horregatik, ondoko puntuak azpimarratu nahi ditugu:

- Praktiken Komunitatetako dinamikak guztiz uztartzen dira interes beraren inguruan ari garen profesionalen zereginetan. Elkarren arteko kohesioa garatzen laguntzen du eta norberaren praktika hobetzen du. Tamalez egun oraindik ere, urriak dira unibertsitate eta gizarte eragileen arteko hartu-emanak. Maiz irakaskuntzan, proposamen berriak sartu behar izaten ditugu irakasleok. Gutako batzuk berrikuntza horien artean tentsioak edota erresistentziak adierazten ditugu. Oraingoan berriro ere, profesional ezberdinak elkarrekin aritzea eta proiektu komun bat gauzatzea ikaskuntzari onurak ekartzeaz gain, lortzen den ikuspegia osatuagoa da. Zentzu honetan, eta oraingoan elkarrizketarekin gertatu den bezala, elkarlanak banakako lana hobetzeko bide bihur daiteke eta ikasitakoa praktikan jartzeko ere aukera eskain dezake. Ikasitakoari zentzua emanez.
- Elkarlana gauzatu ahal izateko tresna egokia da sortu genuen proiektuaren gida. Tresna hau, hobetzen joan da, egoera berriei erantzuteko ala uneko ustekabeak gainditzeko (irakasle berriak…).
- Proiektu honetarako ezarri ziren helburuak eta ikaskuntza emaitzak guztiz bete direla baieztatu daiteke. Zentzu honetan lorpen handia izan da eta sentipen atsegina utzi du irakasleen artean baina baita ere ikasleen artean. Garrantzi berezia eman nahi diogu:

— Ohiko unibertsitateko jardueratik aldentzen den proposamena da hau eta hasierako aurriritziak bestelakoak baziren ere bukaeran ikasleek gustuko duten lana izan da.
— Lan egiteko metodologia gustukoa izan dute eta unibertsitatetik kanpoko eragileekin jardutea ongi baloratu eta beren formakuntzarako esperientzia positibo bezala hartu dute.
— Ikasitakoa praktikara eramateko aukera izana (esaterako elkarrizketak gauzatzean) eskertu dute.
— Eskolako errealitatea eta egun eskolak bizi duen aniztasunari erantzun egokia emateko baliabide berriak ezagutu dituzte ikasleek.
— Proiektua amaitutakoan ikasleei ahotsa eman izanak ahalbideratu du zenbait hobekuntza proposamen jasotzea eta horiek kontutan hartzea hurrengo ikasturterako.

Gure testuinguruan dugun aniztasunari erantzun inklusiboa eman ahal izateko, eremu ezberdinetako profesionalak elkarlanean aritzea ezinbestekoa da. Hau aise aurreikusi daitekeen arren praktikara eramatea zaila suertatu ohi da. Hemen aurkeztu dugun esperientziarekin norabide horretan urrats sendoa eman dugunaren ziurtasuna dugu.

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Decoding

Using Methods from Cognitive Psychology to Elucidate Mental Processes

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Abstract

The *Decoding the Disciplines* paradigm has provided instructors and scholars of teaching and learning with an effective framework within which to increase student learning. *Decoding* was originally limited to those elements of learning that could be captured through a systematic intellectual conversation with an expert (the *decoding* interview, which makes explicit the implicit knowledge of experts). In this paper I will describe how tools from cognitive psychology can be used to supplement the *decoding* interview. Cognitive psychologists employ a variety of methods to explore unobservable mental processes. For example, an analysis of eye fixations while people are asked to glean information from an image can provide insight into the cognitive processes underlying the interpretation of that image. In the current study we analysed a *decoding* interview and eye movement recordings while faculty and students interpreted graphical data. The goal of this study is to identify ways to improve students' ability to communicate clearly about data. Results from a *decoding* interview revealed key elements of graphs and implicit mental operations that are important for interpretation of graphical data and could be made explicit for students. Eye movement recordings of both students and faculty during the verbal interpretation of graphical data revealed that faculty are more confident in their expertise and outperformed students in their description of data. While there are significant individual differences in eye fixation patterns, faculty make more fixations and fixate longer on aspects of the graphs that carry the most important information. Data from both introspection and eye movement recordings revealed that implicit mental processes are involved in the interpretation of graphs by experts. This could be explicitly articulated to students to help them understand and communicate more clearly about graphical data.

1. Introduction

A central goal of many undergraduate programs in psychology (and other disciplines in the social and natural sciences) is to improve quantitative literacy skills. One particular aspect of quantitative literacy that is central to students' success in the psychology major is their ability to interpret graphical data. This is a *transferable skill* that should be useful to students regardless of their chosen path post-graduation.

We have previously reported that students struggle with interpreting and, consequently, communicating clearly about data. Duffy & Cameron (2015) reported that, in an assignment designed specifically to practice this skill, students did not speak or write clearly about data. Moreover, students often appeared not to understand the data they were presenting. In a follow-up, two-part study (Cameron *et al.*, 2016), 157 students completed a modified Academic Skills Inventory (Perry, Singer Foust & Elicker, 2013) in which they rated their understanding of research methods, generally, and quantitative information, specifically and 69 students completed a written assessment on related information. Students, regardless of their academic year, reported good understanding of quantitative data. By contrast their written responses did not reflect such an understanding. Overall, these results suggest that empha-

sis should be placed on improving students' cognition and metacognition before emphasizing the mechanics of communication. We have attempted to improve students' awareness of their own metacognition, but found that it did not clearly improve learning (Cameron & Duffy, 2017).

We continue to explore ways to improve students' ability to interpret and communicate clearly about graphical data. The current study was inspired by the *Decoding the Disciplines* paradigm, and we expand it to include methodology from cognitive psychology.

1.1. Description of Decoding the Disciplines

Decoding the Disciplines (Pace, 2017) is an approach to enhance student learning that helps faculty make *explicit* for their students the *implicit* or tacit knowledge they have and the mental tasks that they employ as experts in their field. *Decoding* involves 7 steps: In Step 1 the instructor *identifies a bottleneck to learning*. A bottleneck is a particular issue with which students struggle and overcoming it is critical to the students' understanding of the discipline. In Step 2 the instructor *uncovers the mental tasks needed to overcome the bottleneck.* Through a *decoding* interview, the instructor makes explicit the step they use to do the mental operations involved in the "bottleneck". In Step 3 the instructor *models these tasks*. The instructor shows the students how they work through the mental operations and then gives students practice and feedback on the task (Step 4). In Step 5 the instructor *motivates and lessen resistance* to the tasks. Finally, the instructor *assesses student mastery* (Step 6) and *shares what has been learned through the Decoding process* (Step 7).

1.2. Description of Cognitive Psychology

Cognitive psychology is the scientific study of mental processes, such as language, memory and attention. It is the study of thinking, generally. Cognitive psychologists use behavioural techniques to understand the mechanisms that underlie mental processes that cannot be directly observed. Recording eye movements is one way that cognitive psychologists access mental processes that are difficult to measure. The recorded "scan patterns" are known to vary as the viewer is asked to extract various types of information from an image (e.g., DeAngelis & Pelz, 2009; Yarbus, 1967) and thus to reflect mental processes.

1.3. Description of the problem

The problem, or "bottleneck" in learning that is addressed in the current study is that ***students struggle to interpret and communicate clearly about graphical data.*** We have used a traditional *Decoding the Disciplines* approach – the first author was interviewed and guided through an introspection of her own practice in interpreting and describing graphs, in order to make *implicit* mental processes *explicit*. In addition, we have tracked the eye movements of students ("novices") and faculty ("experts") while they interpreted and described graphical data. The goal is to understand better what experts do when they interpret and communicate about graphical data and to make explicit the steps they use so that they can be taught to students.

2. Method

2.1. The Decoding Interview

Two American faculty (one historian and one communications professor) interviewed the first author (an American-educated psychologist) and, in the same interview, a German physicist who shared a concern about the "bottleneck" described above. The interview lasted about an hour and a half. The interview was audio-recorded, transcribed by an research assistant, and verified by the interviewee. The types of questions asked by the interviewers were to describe what it is that students can't do (the bottleneck), when they encounter it in a course, and an example of when students get stuck. They then probed the *practice* or *process* by which the interviewee interprets graphical data. The goal of the interviewers was to press the interviewee to make explicit the mental processes that are typically implicitly occurring in her practice. The transcript was then reviewed to explicitly articulate the steps identified by the interviewee. Moreover, we extracted themes that emerged from the interview. In the near future we will use this information to complete Steps 3-6 in the *decoding* process. The current paper reflects Step 7 (dissemination of knowledge) about Steps 1 and 2.

2.2. Descriptions of Graphs and Eye Tracking

The participants were eleven female undergraduate students (mean age of 20.9 years) and 11 faculty members (4 female, mean age of 42.5 years) at Carthage College, a small, private liberal arts college in the Midwest of the United States. Students were primarily psychology majors and faculty disciplines included psychology, sociology, chemistry, neuroscience, environmental science, math, music and religion.

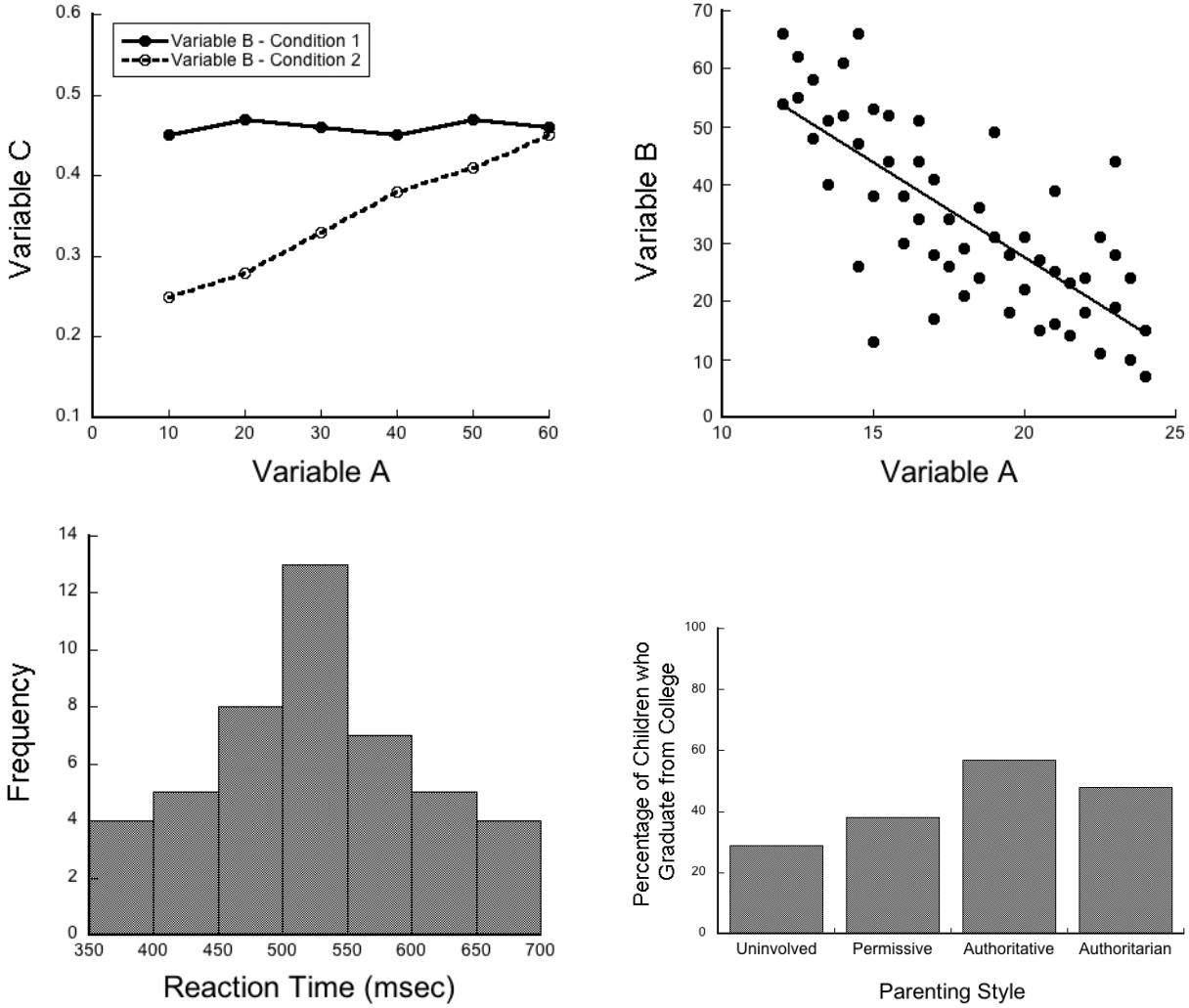
All participants completed a "graph-reading" task while their eye position was monitored by an SR™ EyeLink Portable Duo Eye Tracker. On half of the 16 trials, participants were given 20 seconds to examine a graph while their eye movements were recorded and *then* they were asked to provide a verbal description of the graph. On the other half of the trials they were given 60 seconds to describe the graph *while they were viewing it*. Half of the trials contained graphs that had "abstract" variables and half had concrete variables (see *Fig. 1*)[1]. Graphs were presented on a 23" ASUS LED monitor with a 1920 × 1080 resolution and a 59Hz refresh rate and were viewed at a viewing distance of 120 cm. After testing, participants responded to the question: "On a scale of 0 (novice)-9 (expert), how experienced do you feel you are with interpreting graphical data?"

Verbal responses were "graded", by the author, on a scale of 0-10, considering overall accuracy and clarity, the amount of detail and description of the *pattern* of results (not getting caught up in extraneous details), and the appropriate use of the term "correlation".

In terms of eye movement recordings, the dependent variables of interest were the "dwell time" (i.e., the amount of time the observer fixated) and the number of fixations on different "regions of interest", which, in this study, were defined as axis labels and values, data points and legends (when present).

[1] The pattern of results was the same for the *talk while viewing* graphs and the *view graphs and then talk* conditions. Here we present results from the view and then talk condition.

Figure 1
Examples of the four graph types (histograms, bar graphs, factorial line graphs and scatterplots) used for "graph-reading" and eye-tracking.
Note that variables were either abstract (e.g., variable a and variable b) or concrete (e.g., frequency and reaction time)



This study was approved by the Carthage College Institutional Review Board. All participants were adults and provided informed consent prior to testing, which lasted less than 30 minutes. Students were compensated with course credit and faculty with a $5 gift card.

3. Results

3.1. Decoding Interview

An analysis of the *decoding* interview revealed the following mental steps in the interviewee's graph-reading practice:

1. *Look at the y-axis and consider what is being measured (i.e., the dependent variable).* In the interview it became clear that an understanding of the dependent variable requires

significant knowledge. The interviewee became immediately aware that she must make sense of this variable by considering the *method* used to collect the data. So, in the interpretation of the data, there is a need to go back and forth between the numerical data and how they were collected. In addition, there is a need to consider several other aspects of the data. First, there is an assessment of whether or not the data are "within the realm of possibility" – do the data meet some expectation? That is, considering the population to whom the researcher wants to generalize, are the data reasonable? Implicit in this analysis is a consideration of whether or not there might be an issue with measurement or whether there is something that requires some sort of explanation (e.g., a surprising finding). Also, implicit in this analysis is a consideration of variability and the inherent noise in the data.

2. *Look at the x-axis and consider what is being manipulated (i.e., the independent variable).* In this step, the type of graph is important to understand how many independent variables and how many conditions of the independent variable(s) there were in the study. Again, there is a need to refer back to the *method* to understand the manipulations.
3. *Look for the pattern in the data*. In this step, the interviewee discussed looking for *differences* between data points, such as the *difference* in height between two bars on a bar graph (perhaps the simplest comparison to make). This approach is important because students often get caught up describing extraneous details about the data (e.g., specific data points) and miss the relationship among the data points.
4. *Consider statistical differences, meaningful differences and confounding variables.* Although this is arguably the most important stage of the scientific data analysis, it is a step beyond the bottleneck of interest, which is a clear *description* of data. It is the primary goal of the current project to improve students' ability to describe the graphical data clearly.

The *decoding* interview uncovered a number of aspects of graph-reading that may contribute to the difficulties that student face in communicating clearly about them. First, student often seem to assume that the results in graphical depictions of data are self-evident. They don't appear to consider what others know, so that they can provide critical information. For example, students often fail to provide a clear description of what is represented on the x- and y-axes, which is essential to an understanding of the data. In fact, the bulk of the *decoding* interview revolved around what is necessary to understand the y-axis, indicating that results are not "self-evident". Second, the interpretation of graphical data is probably more difficult if the reader has no expectation of what the data *should* look like, or, at least, what is in the realm of possibility. For example, it is helpful to know what range of values one might expect to see represented in a graph of manual reaction times. Depending on the context (for example, for data that the student has collected), it might be important to scrutinize the data to see if something is amiss in the data (e.g., an error was made in measurement) or whether there is a pattern of results that might require some explanation (e.g., there is an unexpected finding). Students may or may not have clear expectations about the results depicted in a graph. Third, and this is at the core of the bottleneck of interest in the current study, clarity in *describing* the graphical data is essential. Clarity requires an understanding of where the data came from, in other words, the methods that were conducted to generate the data. Moreover, clarity requires a description of *differences* or *patterns* in the data. For an undergraduate, the ability to successfully complete this step would be a significant achievement and a move past the bottleneck. Fourth, graph reading includes an *interpretation* of the data, including how they fit within a broader context, and the fifth includes an assessment of the *significance* of the data (statistically and in terms of meaningfulness). This requires an under-

standing of statistical concepts, such as variance and the consideration of confounding variables. These final two steps require a level of analysis that is significantly more sophisticated and student clearly might struggle with these steps. As noted above, they are issues that go beyond the bottleneck of interest here.

A general theme that emerged in the *decoding* interview is that there is a lot of background information that is required to interpret a graph. There are hidden mental processes, such as considering the *method* by which the data were collected that probably occur in "expert" graph-readers. Helping students communicate clearly about data will likely involve modelling such mental work as going back and forth between data and method.

3.2. Descriptions of Graphs and Eye Movement Data

Faculty were more confident in their graphical proficiency and their performance was higher than students. The self-ratings of graphical proficiency were significantly higher for faculty (7.5 pts) than students (5.45 pts), as confirmed by a T-Test. *Fig. 2* shows average scores obtained by students (in blue) and faculty (in red) for graphs with concrete and abstract variables. A Two-Way Mixed Analysis of Variance indicated that faculty outperformed students and descriptions were better for graphs with concrete variables, compared to abstract ones. The interaction between graph type and participant group narrowly missed significance. This indicates that students may have relatively more difficulty than faculty in interpreting data with the abstract variables. Although faculty outperformed students, it is interesting to note that their performance was not perfect – a point to be considered in the Discussion.

Figure 2

Score on graphical description as a function of graph type for students (in blue) and faculty (in red). Error bars reflect standard error of the mean

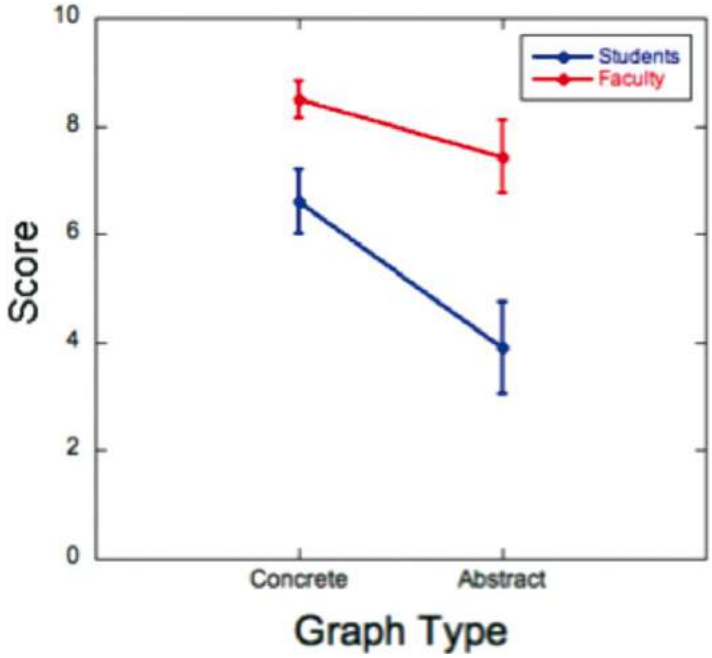


Figure 3

Dwell time as a function of interest area.
Faculty spent more time looking at legends, and to some extent, axis labels

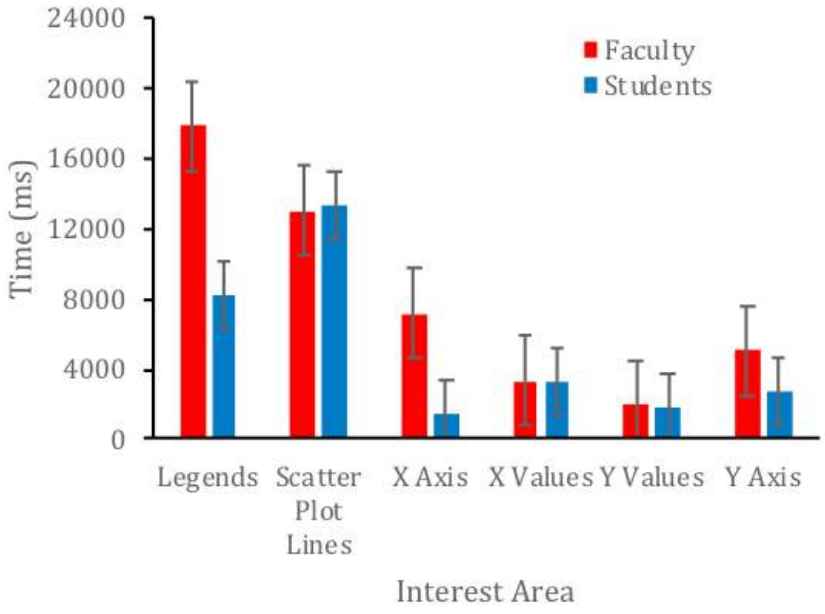
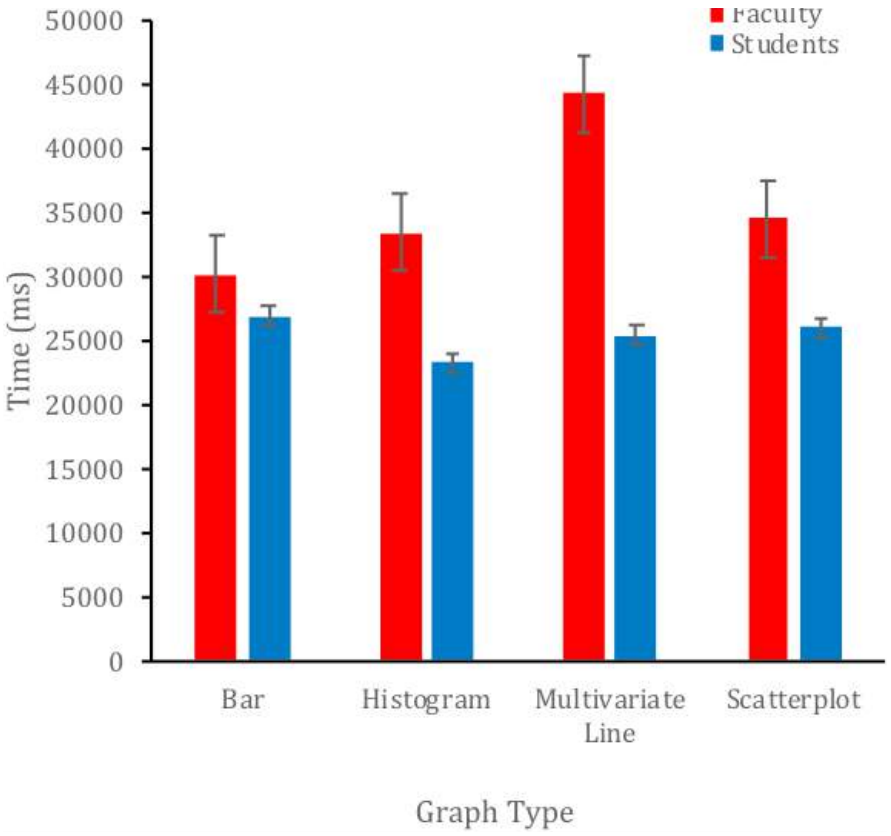


Figure 4

Dwell time as a function of graph type for graphs with concrete variables.
Faculty modified their eye movement patterns whereas students did not



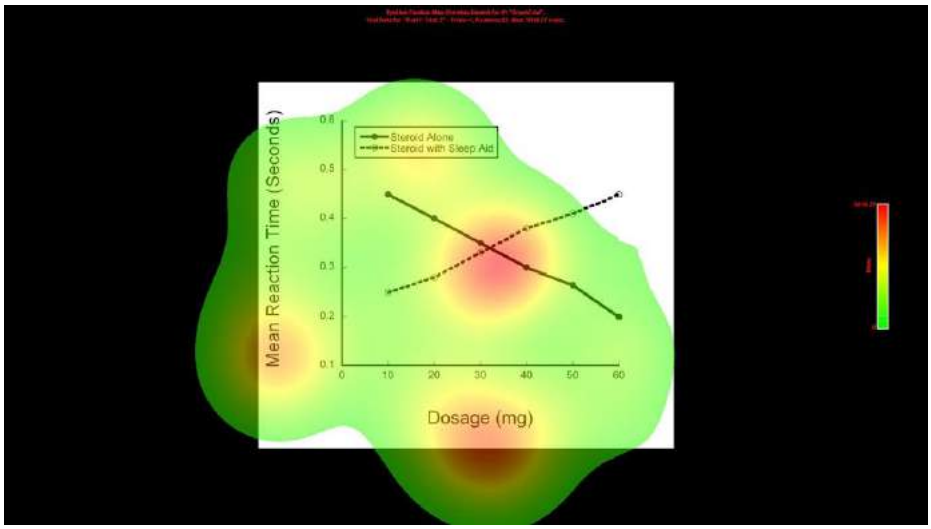
Although there was considerable individual variability in eye movement patterns, faculty, overall, had longer "dwell times" than students for all interest areas and this was particularly true for legends (see *Fig.3)*. Though not significant, faculty also spent more time looking at axis labels, than did students. Students' dwell times did not differ among graph types, as shown in *Fig. 4*. The most notable differences between the eye movements of faculty and students emerged in the eye movement patterns of factorial line graphs. Dwell times were longest for faculty in the factorial line graphs, arguably the most computationally demanding graphs to interpret (see *Fig. 4)*.

Fig. 5 shows "heat maps" of eye fixations by (a) one student and (b) one faculty member. "Hotter" colors represent more fixations. This particular faculty member, and faculty in general, made more fixations at the legend, whereas the student fixated on axes and the data themselves, which may not provide the most relevant information for interpretation.

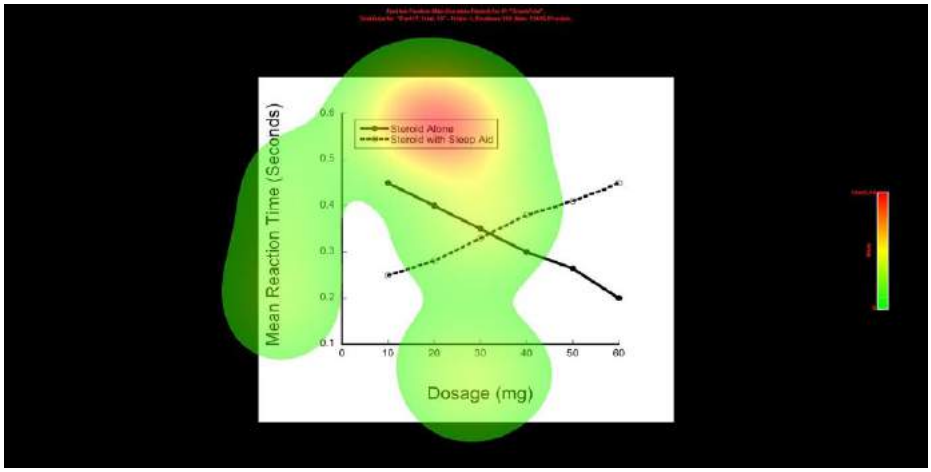
Figure 5

Heat maps from (a) a student and (b) a faculty member.
The "hotter" colours reflect more fixations to those locations

a.



b.



In sum, faculty make more fixations and have longer dwell times on aspects of the graphs that carry the most important information, consistent with the practice described in the *decoding* interview.

4. Discussion

The results of this study underscores two important points about graph-reading. First, graph-reading is a complex and difficult cognitive task. Although faculty performed significantly better than students, there was variability in their responses. Though not specifically reported here, some graph types are easier to describe than others. Moreover, faculty from non-scientific disciplines performed somewhat worse than those from scientific disciplines, none of whom performed flawlessly. It is, thus, perhaps not surprising that students struggle to communicate clearly about graphical data.

Second, the implicit mental processes involved in graph-reading may not be readily apparent to "experts" and hence we may neglect to teach them. In the *decoding* interview the author very quickly came to appreciate the existence of implicit mental processes operations during the effective interpretation of graphs. Likewise, the eye movement data suggest that faculty, unconsciously, modify their eye movements (and hence their thinking) to account for graph type and in response to the information that needs to be gleaned from a graph, whereas students do not. In the *decoding* interview the interviewee commented that she thinks that she learned how to talk clearly about graphs as a graduate student in a model that the interviewer described as an "apprentice" model. This suggests that this is a skill that requires significant resources to teach.

Given the complexity of the task and the extent to which it relies on complex mental processing that is generally invisible to both faculty and students, exercises that attempt to help students explicitly to complete these mental operations could lead to better student understanding of and ability to communicate about graphical data.

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Lost in Language Comprehension: Decoding putatively extra-disciplinary expertise

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Abstract

Decoding the Disciplines has proven to be effective in fostering student learning by explicating disciplinary expertise. Here, Decoding the Disciplines will be used to analyze characteristic student difficulties which on a first level are specific to mathematical logic as an academic discipline, but on a deeper level turn out to be related to language comprehension in general.

1. Introduction

A rich body of research indicates that in their learning process students face critical barriers which are related to subject matter rather than to attributes of students themselves such as prior education or personal engagement. Such barriers have been named threshold concepts [1], misconceptions [2], or bottlenecks [3]. While these notions are not strictly synonymous they all refer to barriers to learning related to difficulties intrinsic to subject matter.

On the other hand teaching is quite often affected by the "curse of expertise". Being experts of their subjects instructors typically are not aware anymore of all the steps required to master a concept or process in their discipline. In the course of their carriers aspects of their procedural and declarative knowledge have become tacit knowledge. This of course makes it hard for instructors to relay their expertise to students.

Decoding the Disciplines [4] has proven to be helpful in decoding disciplinary expertise and in supporting students to acquire such expertise. By design Decoding focuses on discipline related bottlenecks to learning.

In this work the Decoding process will be used to investigate characteristic student difficulties in elementary mathematical logic. A Decoding interview will reveal that experts do not run into such problems since they are parsing (i.e. syntactically analyzing) logical statements. A straightforward application of the Decoding process would suggest modeling the experts' process of parsing in order to help students overcome their difficulties. Data from formative assessments and classroom observations, however, indicate that the bottleneck related to parsing is not restricted to logical statements, but rather generic.

Decoding is a potentially iterative process. It is not rare that decoding one discipline specific bottleneck discloses another discipline specific bottleneck. In the case investigated here the initial bottleneck related to mathematical logic discloses a general bottleneck which extends way beyond Mathematics. In fact, it relates to language comprehension in general. Its relevance might well extend to other academic disciplines as argued in Section 7.

This work is structured along the Decoding the Disciplines cycle which is described in detail in [4]. The cycle starts with the identification of a bottleneck, i.e. a place where many

students encounter obstacles to mastering the course material (step1). Here, the bottleneck will be described in Section 2. Section 3 covers step 2 which is central to the Decoding process: an in depth exploration of the steps that an expert in the filed goes through in order to accomplish a task involving the identified bottleneck. Subsequent steps involve modelling the expertise decoded in the previous step (step 3), providing opportunity for students to practice and receive feedback (step 4), and to motivate students (step 5). Here, these steps will be covered jointly in Section 4. The account is necessarily anecdotal in parts as some of the insights have been gained by classroom observations. Section 5 shortly reports on step 6: the assessment of how well students are mastering the learning tasks of step 2.

2. Bottlenecks

Predicate logic is a part of mathematical logic dealing with quantified statements. Such statements involve quantifiers like "every", "each" (formally: for all, denoted by ∀) or "some", "there is a" (formally: there exists, denoted by ∃). Most instructors in the field will be familiar with students' difficulties to formulate the converse of quantified statements, like

(1) Everybody hates math.

More often than not students state the converse to be

(2) Nobody hates math.

rather than

(3) Someone doesn't hate math.

Most students are able to overcome this difficulty after they have learned to write such statements in the formalized language of logic

(1′) ∀ *h* in humans: *h* hates math
(3′) ∃ *h* in humans: not (*h* hates math)

and by applying the rule that "not ∀" is equivalent to "∃ … not". (Simply applying this rule, of course, does not imply that students understand it.)

In my experience student performance rapidly deteriorates as soon as there is more than one quantifier involved, such as in

(4) Everybody likes some beverage.

which formalizes into

(4′) ∀ *h* in humans: ∃ *b* in beverages: *h* likes *b*.

The bottleneck students are experiencing can hence be phrased as: Given statements in natural language involving quantifiers students find it difficult to formalize such statements, in particular if there is more than one quantifier involved.

3. Decoding

The central step in the Decoding the Disciplines cycle explores in depth the steps a disciplinary expert would go through to accomplish the task identified as a bottleneck. Often this is done via a Decoding interview where two experts from preferably unrelated fields are interviewing an expert. The interview aims at making tacit expertise transparent by asking probing questions. These questions help the expert to detail his or her expertise in sufficiently small steps until the interviewers have the impression that they could carry out these steps themselves.

In my case a legal professional and a Ph.D. student in Educational Sciences were carrying out the interview with me being the interviewed expert. In the course of this interview I have become aware that I am analyzing the statement at hand according to a grammar laid out by the pattern of formal descriptions:

(5) <Quantifier> <Variable> in <Set>: <Predicate depending on Variable>

In essence, I am identifying the objects denoted in brackets much in the same way as one is taught to analyze sentences in foreign language education (e.g. identify subject, predicate, and object). In the parlance of Linguistics and Computer Science this process is known as parsing.

In the case of statement (4) parsing proceeds as follows:

— Identify the (first) quantifier, here "everybody", i.e. ∀. (Typically students rarely fail at this rather superficial step of analysis.)
— Identify which variable is quantified and the underlying set. Here everybody refers to the set of all human beings.
— Choose a descriptive symbol to denote the variable. "Everybody" quantifies "for each human", so *h* is a telling symbol for that variable.
— The rest needs to be the predicate (here: "likes some beverage"). Replace the quantifier by the symbol introduced in the previous step. Here this leads to "*h* likes some beverage".
— If the predicate in the previous step involves any further quantifier iterate, starting with the first step.

4. Good Enough Theory

Straightforward application of the Decoding cycle would have lead me to model the process of parsing explicitly in class. In preparation for that I rewrote the preclass reading material on quantifiers also outlining the process sketched in Section 3 explicitly in written form.

In these preclass reading materials the chapter on quantifiers is preceded by a chapter on set theory. A discussion with a group of students during the class on set theory lead me to change my approach, however. Students had to formalize the following set description:

(6) The set *P* of all subsets of the set {1,…,10}, which are disjoint to the set {1,…,5}

Some students were puzzled whether "disjoint" refers to the "set *P*", to "all subsets", or to "the set {1,…,10}". I was puzzled as these students did not view the plural form "are" as an

indicator that the adjective "disjoint" can only refer to a noun which is in plural form as well. This leaves "subsets as the only candidate. In fact, some students rephrased the statement by saying: "It could be the set *P* which *is* disjoint, or the subsets which *are* disjoint, or the set {1,…,10} which *is* disjoint." (All emphases are mine.)

Obviously the students did not parse the given set description. That did not bother me, of course, as I had already identified parsing as part of my expertise to be relayed to them. However, students seemingly did not perceive the plural form "are", even replacing it by "is" if needed.

This anecdote lead me to the impression that the grammatical structure of the statement did not play a role at all in my students' perception of the statement (6). Rather, it seemed to me, students were freely rearranging the words in the statement and changing the plural "are" to "is" if needed in order to make the statement perceived by them grammatically sound.

This observation aligns well with the Good Enough (GE) theory of language comprehension [4]. GE is in contrast to traditional theories of language comprehension which assume that sentence processing is algorithmic. However, recent findings challenge this assumption and support the idea that the meaning people obtain for a sentence is often not a reflection of its true content. GE posits that language processing is sometimes only partial and that semantic representations are often incomplete.

GE further posits that language comprehension does not necessarily make use of syntactic structure, in particular when it comes to more complex sentences. It is as if people use a semantic heuristic rather than syntactic algorithms such as parsing to obtain the meaning of more difficult sentences. For instance, people tend to perceive

(7) The dog was bitten by the man.

as indicating that the man is the actor and the dog is the patient of the action [4]. It is as if the human language processor disassembles statement (7) into "dog, bite, man" and rearranges these words according to a heuristic grounded in daily experience. In an academic learning contexts, however, students necessarily lack such a semantic heuristic as they are still unexperienced with the semantics.

That anecdote taught me an important lesson: Parsing by itself cannot be considered as a skill students are equipped with but which they are not making use of, at least according to GE and my observations. Contrast that to writing which is a skill students can be assumed to be equipped with but which they might not use.

Consequently, when modelling to students the formalization of quantified statements as parsing, I run at least two risks. First, I am building on a skill students do not necessarily possess (yet). Second, even if students are familiar with that skill it might constitute an emotional bottleneck to them. Parsing might have been part of their language education. However, it is not uncommon that students of technical subjects, like in my case Computer Science, dislike language education. Hence, they might be consternated when asked to apply procedures of disciplines which they consider to be disjoint to their field of study or even dislike.

Also note that these insights make overcoming the originally identified bottleneck even harder. The Decoding interview revealed that parsing is helpful to overcome the bottleneck. Further observation and analysis revealed, however, that parsing itself might be a bottleneck to many students.

5. Modelling, Practise and Feedback

My observations in class along with the GE theory of language comprehension suggested that I should not directly go through the steps that I as an expert would do when formalizing a quantified statement or set description. Proceeding in such a way could cause students being stuck in the bottleneck of parsing.

In order to address both bottlenecks, formalizing and parsing, at the same time, I decided to let students do the modelling of the task themselves. That is, before performing the desired skill of parsing in front of the students myself, I ask students to perform parsing in front of their fellows – initially without having introduced the process of parsing! Underlying this decision is a consequence of the curse of expertise and the foundation of Peer Instruction [5]: Students who have recently grasped a concept or process often are more able to relay their recently gained knowledge to fellow students than is their instructor with his or her time honored expertise.

In order to reach this double goal I pose questions of the following type in class:

Consider the following description of a set: The set P of all subsets of the set {1,…,10}, **which** are disjoint to the set {1,…,5}.

Which phrase does the relative pronoun "**which**" refer to?

(A) "The set P"
(B) "subsets"
(C) "the set {1,…,10}"
(D) to something else not mentioned in (A)-(C)
(E) This is no unambiguous answer to this question.

I ask students to answer this question individually first, and then to explain their reasoning to their neighbors. During the ensuing discussion the idea of parsing, possibly not named such, but used by some students, spreads the classroom. Effectively students teach students to parse during that discussion phase without me having to relate to their (possibly negative) experience with parsing from language education and possibly triggering an emotional bottleneck.

After completing the discussion I take the opportunity to perform parsing in front of the class. I also remind students that they might be familiar with parsing from other contexts of their education, in particular language education.

Note that the above task not only serves modelling (step 3 of the Decoding cycle). It also gives the opportunity for practice and feedback (step 4) and to handle a possible emotional bottlenecks (step 5).

I then continue this combination of modelling, practice, and feedback with the following task:

What or who is lukized, i.e. what is "lukized" referring to?

1. The montillation of quasselties which are lukized has been bractered.
2. The montillation of quasselties which is lukized has been bractered.
3. The montillations of quasselties which are lukized have been bractered.

Due to the usage of nonsense words, this tasks effectively asks students to parse without having semantic information. Note that GE does not claim that humans never use

the syntactic structure of a sentence in order to comprehend its meaning. Rather it posits that people rather tend to rely on semantics heuristics. In situations like the above most students are perfectly capable of answering the three questions using parsing as their natural strategy. The task serves the purpose of showing to the students that they are well able to parse whatever their prior experiences with parsing are. The task also serves to show them that parsing is a perfect strategy in particular in situations where the semantics is not completely clear. As a matter of fact, discipline specific statements like (6) at first sound like "montillation of quasselties" to many students, i.e. initially they lack any meaning of them.

6. Assessment

Although the work reported here is still ongoing first data indicates the effectiveness of the teaching strategy outlined in the previous section. Evidence is provided by on-line formative assessment tasks which implicitly require parsing. Student performance on such tasks noticeably increased from a course taught before (T_1) and after (T_2) the Decoding process described above had been carried out. Students attending the course at T_2 on average performed superior on such tasks compared to those attending at T_1. In some cases the success rate increased from 40% to 70%. These increases are unlikely to be attributed to other parameters as the students of both groups on average performed comparably at other tasks.

7. Discussion and Conclusions

This work provides a further example of the efficacy of the Decoding the Disciplines process. While it is quite common that uncovering one disciplinary bottleneck leads to uncovering another disciplinary bottleneck the situation analyzed in this work is somewhat different. Here, uncovering a disciplinary bottleneck helped to uncover an extra-disciplinary, if not general bottleneck.

One might interpret these findings such that a lack of extra-disciplinary skills (here: parsing of natural language) gets into the way of acquiring disciplinary expertise. This interpretation could easily lead to instructors' frustration: Teaching becomes even harder as instructors have to nurture skills outside their discipline.

The connection to the Good Enough Theory, however, indicates that the lack of the putatively extra-disciplinary skill of parsing is quite common and, hence, provides an opportunity to teach a skill whose usefulness largely extends the specific discipline.

Moreover, it seems reasonable that the findings of this work extend well beyond the specific discipline of Mathematics. In any discipline students as novices will initially lack discipline specific semantic heuristics which would help them to comprehend discipline specific statements without the need of parsing them. Hence, they need parsing skills in order to be able to make sense of statements whose semantics they are currently learning. Without parsing students might perceive the meaning of a discipline specific statement in a way which does not reflect its true meaning. Instructors of any discipline, call it montillation theory, might want to make a statement on the "montillation of quasselties which are lukized". Students, however, might perceive this as a statement on the "montillation of quasselties which is lukized."

In summary, this work shows how Decoding the Disciplines in particular and Scholarship of Teaching and Learning in general can nicely tie with and profit from established ac-

ademics research, in this case the psychology of language comprehension. It also provides an understanding of seemingly extra-disciplinary, language related difficulties of students which might far extend the case of Mathematics.

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Posterrak

Posters

A Quantitative Approach to Problem-based Learning based on a questionnaire: a model for student learning outcomes (a Kingston case study)

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Abstract

As interdisciplinary programmes at various universities are attracting students with a wide spectrum of abilities and interests from different backgrounds, the focus of teaching in Engineering subjects is shifting from subject(s) *per se* to problem-based learning.

Although this method of teaching and learning has been proved to be effective, it is worth understanding quantitatively its general implications on various disciplines.

A simple mathematical model is proposed to quantitatively predict the knowledge gains of a student who is involved in collaborative learning. Using this model one could estimate analytically the levels of learning achievements by students in small groups (maximum group size: 4).

This predictive model is a complex function of the following parameters: previous knowledge of the learner, a measure of the environment conducive to learning, and the level and amount of information communicated which is the product of duration of exposure or communication and rate of communication among the students in a particular group.

The above input parameters are required to evaluate the quantity, and to measure the level of attainment by a learner through PBL. It is assumed that the knowledge gained by the learner within the group-learning environment cannot exceed the defined cognizance of the leading student. Typically, the number of students not exceeding four in a group is a reasonable figure to reflect variations in the knowledge base of participating students.

We are using this model in a study at Kingston University, London to assess if students that participate in collaborative learning perform better on the critical-thinking tests than students who study individually. We will share the results and our experience with the conference delegates.

1. Introduction

In response to the significance of questionnaire, Brookfield (2017) says ''when my wife asks me 'how did class go', I usually answer 'its's hard to tell' or I need to read the critical questionnaire to know what went on''. It therefore highlights the significance of learning outcomes(LOs), modes of learning and the importance to see through the student's eyes.

Despite several learning techniques in place, excepting a few students with lateral thinking abilities, bulk of the students face 'What to Learn' and 'How to Learn' problems. One of the widely recognized learning methods is the problem-based learning (PBL). It is part of constructive learning where a small group of students actively participate in their own learning process and construct their own knowledge (Lei, 2005), (Biggs, 2003), (Gokhale, 1995). In the process of learning, LOs play a crucial role because it leaves significant impact

on the students' professional-growth & career-differentiation and knowledge, a measurement of learning.

Key assumptions of the study:

1. the idea of widening participation implies students with varied skills. So, have to achieve equalising studies to all learners
2. it is laborious and time consuming to assess and the balance the studies in a classroom, especially in large class cohorts
3. reduce the skill gaps
4. going more online, so more conducive to learning. It gives ample time for independent study, and lecture material is available in advance prior to lecture.

In recent years, many educational institutions have adopted PBL as a substitute for traditional teacher-centred learning in various disciplines. Lei (2005) says the PBL technique, which enhances interdependence and communication among students, was shown to be especially suitable for engineering studies. Hunt (2011; p. 10) points out the advantages of group learning, and Twyman and Heward (2018) list twelve low-level tech strategies that works in any classroom, especially for group working. In another similar study Rotgans. I.J. *et al.* (2018) proposed a structured student's model to understand the inner workings in education.

However, we think this research is yet to be fully explored. So our design and strategy for L/T also focusses on group learning. We see the significance of PBL :

a) as particularly evident in large cohorts (for typically in sizes of 200 or more), and its application lies in handling real-time problems
b) as interdisciplinary programmes at various universities are attracting students of wide spectrum of abilities and interests from different backgrounds
c) a methodology popular due to the nature and potential complexity of engineering problems being tackled in the present day.

2. Literature

Although this method has been proved effective, it is worth understanding quantitatively its general implications on various disciplines (González-Marcos A. *et al.*, 2016). For this purpose, a model needs to be developed owing to the difficulties associated with conducting classroom experiments involving huge number of students. Such a model is expected to reflect the data obtained from test scores for comparative studies.

Brookfield S.D. (2017) says in a learning module, critical questionnaire is the instrument to see through the students' eyes. In our study, an assessment task (Appendix-1) was given to [1]one-third (attendees) of forty-two registered students in a single-page Questionnaire**;** the year is 2019. All replies are based on eighteen questions that are set in four themes (responses in Fig. 1):

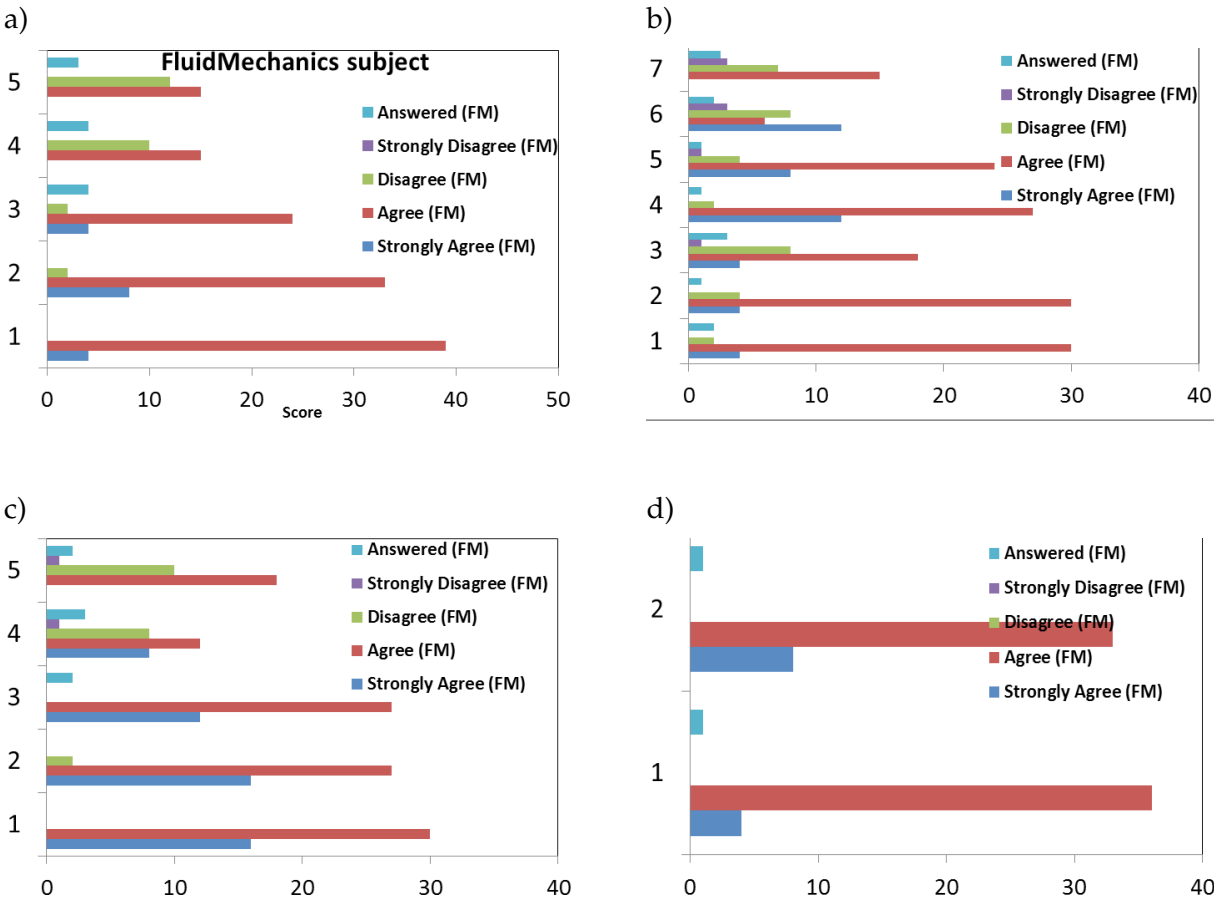
a) the subject knowledge in Fluid Mechanics
b) L/T

[1] Brookfield (2017 page 111) says that for large cohorts about 200 or more, students 20% of sample data is sufficient to complete questionnaire. In Appendix - 1, we have closely had replies 33.3% of the class strength.

c) Communication (& time management), and
d) tests/exams (group learning and assessment)

Figure 1

Four bar charts are the students' responses, based on the Questionnaire consisting of four themes (with scores):
Strongly agree(4), Agree(3), Disagree(2) and Strongly disagree(1)



3. Findings

Findings in bar charts (discussed in theme-wise below) show what has worked for the students and what has not. This will help the educator what to carry forward those class activities for next years. For those not working, it will allow revive lecture material and do necessary changes through continuous formative assessment feedback (Hattie, J. and Timperley, H. 2007).

These findings from the questionnaire are interpreted using multiple intelligences (Fuller R.G. *et al.*, 2010). Also, these results are redacted with Brookfield's classroom experiences and methodologies. These non-grading assignments helps students learn from each other's scholarship, skills, and experiences.

MIs is a subject that helps classifies students' skills in three: more able, medium-level and weaker students. This way, by using appropriate multiple-intelligences, benefits i) studying possible ways of handling ways to manage large class cohorts, ii) ways to repair the so-called 'disadvantages' such as to overcome the prenotion that students are aware of so and so, iii) methods to segregate the complex concepts into a logical sequence and iv) how to present the same in a lucid manner reachable to the average calibre student etc. Here, we need six MIs to interpret questionnaire feedback.

Theme (Fig. 1a). Subject knowledge (in Fluid Mechanics, FM)

Notes: FM is analytical and mathematical based subject. It can be related to logical-mathematical and spatial intelligences. Careful consideration shows that spatial intelligence provides ability to solve real-time system problems. An environment engineer should have skills, with excellent prediction of weather patterns for e.g. pressure depressions etc. The bar chart shows in all subject related questions, the students are quite happy with the learning of the subject, especially with the level of solving problems. This is 100% success, with many Agree and a few Strongly Agree acceptances.

Theme (Fig. 1b). Teaching and learning

The students are encouraged to do self-preparation. This requires consistency reading. We think it benefits weaker students to a greater degree as the material is accessible on LMS/Canvas (Zamora, B. *et al.*, 2012). So, this is an incredible platform to improve thought processes (Love *et al.*, 2014). The MIs that support here are logical-mathematical (problem-solving), linguistic (ability to communicate with peers online and with educator for e-support) and spatial intelligences (good navigational skills to make use of Canvas options to the maximum such Discussion forum, Online chatting etc. for effective learning).

Overall, with regard to this key parameter (LMS), the students agree they are happy with L/T.

Theme (Fig. 1c). Communication

This theme looks to assess the ability and skills to solve fluid mechanics and engineering science problems. Therefore, to achieve LOs we think it is essential to establish a functional relationship between educator and the students for the learning to 'happen'. Again, here, in addition to spatial & linguistic intelligences, we need good interpersonal and intrapersonal intelligences for formal learning. One of the greatest difficulties is to bring most of the students onto the LMS platform, especially before the online-run formative assessments. Canvas at Kingston Uni is a new e-learning tool used for re-designing and re-structuring the ways of assessment.

Theme (Fig. 1d). Tests and Exams

This is the important theme as far as the students are concerned. After a careful understanding, we think in assessments (tests/exams) the students go through the process of perception of the problem and produce correct answers. So, musical intelligences fit to

this element. The students have given the highest rating here, choosing only Agree and Strong Agree options. To recall, group learning happens in flipped sections. This helps them in the future to articulate their problem solving skills. It is particularly brings more benefits students that are weaker in learning and less motivated. as they learn through peer-learning. So, an educator's role is significant with inputs of ideas and thoughts there to keep them engaged in their self-directed learning. In other words, I am trying to formulate how and what activities to include keeping them continuously and effectively engaged.

The findings from the charts (Fig. 1d) show that 12 out of 14 students said: *Group learning in classroom helps with exam preparation* (Fuller R.G. et.al. 2010). And, 11 of 14 students agreed, *I am very confident I will pass the module with good score*. This is a significant finding that there is linearity between group learning and assessment.

Literature gives similar evidence that many students express their desire to learn by engaging in *social interaction* (Baym, N.K. *et al.,* 2004). It allows them to express their feelings and, share common information because students believe it to be a reliable means of communication. Also, they showed that 60% of groups preferred group activities were maximally efficient.

4. Conclusions

We made first attempt to quantify learning in group learning. In the exchange of learning, weaker students tend to get more benefits than those who lead the group. The students use Fluid Mechanics knowledge as a tool for solving complex problems such as understanding the flow patterns in or around solid boundaries, communicating results, concepts and ideas. One of the significant findings here is that 12 out of 14 students have agreed (and one strongly agreed) group learning is an important part of learning, and their proportional confidence level that they pass the module is again 13 out of 14. Overall, the bar charts flag that the module has been run to the 'agreed' level in all aspects.

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Appendix

Assessment task/**Questionnaire**/from1/3rd (attendees) of 42 registered students:

Subject: Fluid Mechanics, Student feedback on Learning 2019; date 02 April 2019. It took 10 mins to complete form. **Eighteen questions** are set in five segments: This collection of information is *facultative* and *anonymous*. The students were told this collection of educational research purposes and publication, only numbers are analysed. If the answer is Yes(Agree), to put 1, others for other columns 0.

	Task feedback scoring on right versus four themes below	**Strongly Agree (score 4)**	**Agree (score3)**	**Disagree (score 2)**	**Strongly disagree (score 1)**
S.No.	Theme-1: **subject Fluid Mechanics**				
1	I find this subject interesting				
2	I have become quite familiar with the standard Fluid Mechanics equations				
3	I am confident in applying these equations for similar numerical problems				
4	I am confident to solve new FM problems				
	Theme-2: **Teaching and learning**				
5	The subject is well-led and managed				
6	I am taking care of my learning needs				
7	I often visit Canvas and revise before coming to the class				
8	The lecture material is useful and covers my exam needs and learning				
9	In addition to Canvas material, I have the habit of reading textbooks				
10	There is a good range of extra-curricular clubs and opportunities for physical exercise				
11	Learning Fluid Mechanics helps me understand Thermodynamics better				
	Theme-3: **Communication**				
12	I feel I can easily approach the lecturer with questions or problems				
13	The lecturers respond well to any concerns I raise				
14	In this module, I received valuable information for my subject learning				
15	I like join to Discussion Forum on Canvas, but never tried due to lack of time				
16	Asking questions by email or through e-support (Canvas) is easier than in classroom				
	Theme-4: **Tests and Exams**				
17	Group learning in classroom helps with exam preparation				
18	I am very confident I will pass the module with good score				

Data Systematization for progressing in SoTL

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Abstract

This paper emphasizes the significance of data treatment for Scholarship of Teaching and Learning (SoTL) progression. The Faculty of Engineering in Bilbao is engaged in different educative projects for answering the present and future questions about industrial and society necessities. In this way, the systematic collection of evidences to corroborate the educational proposal effectiveness in the different aspects of the teaching-learning process and innovation transfer will be revealed as a basic tool. Evidences have three sorts of sources: the university, the project itself and the society. Data analysis and results sharing complete the cycle.

1. Introduction

The importance of Scholarship of Teaching and Learning (SoTL) is growing up in many engineering faculties as educational contribution for answering the present and future questions about industrial and society necessities [1]-[6].

Boyer [6] reconsiders the Scholarship concepts and SoTL becomes a dynamic teaching technique for improving learning processes with a full intention to share it all with other colleges' experiences and publications.

Scholarship of Teaching and Learning approaches to teaching and learning research analyzing different levels in the evolution of engineering educators and understanding that there will be different faculty students in terms of motivation, attitudes, and responses to teaching and learning processes and to instructional practices [7],[8].

There are research objectives in engineering education that will have to be resolved and the universities would have to respond with solutions about educational methodologies, the experimental tools and a new assessment focus, among others. The analysis of data will allow improving the understanding of the educational challenges and the transfer to industry and society [1].

As mentioned above, this paper emphasizes the importance about the data treatment for SoTL evolution. The key indicators and evidences have been placed in three sorts of environments: the university, the project itself and the society.

2. University Data

The university main indicators could be taken into account for specific subjects or general information, for example: enrollment interest rate, mark evolution of students, improvements in student academic performance, interest rate of students from the beginning to the end of the semester, among others.

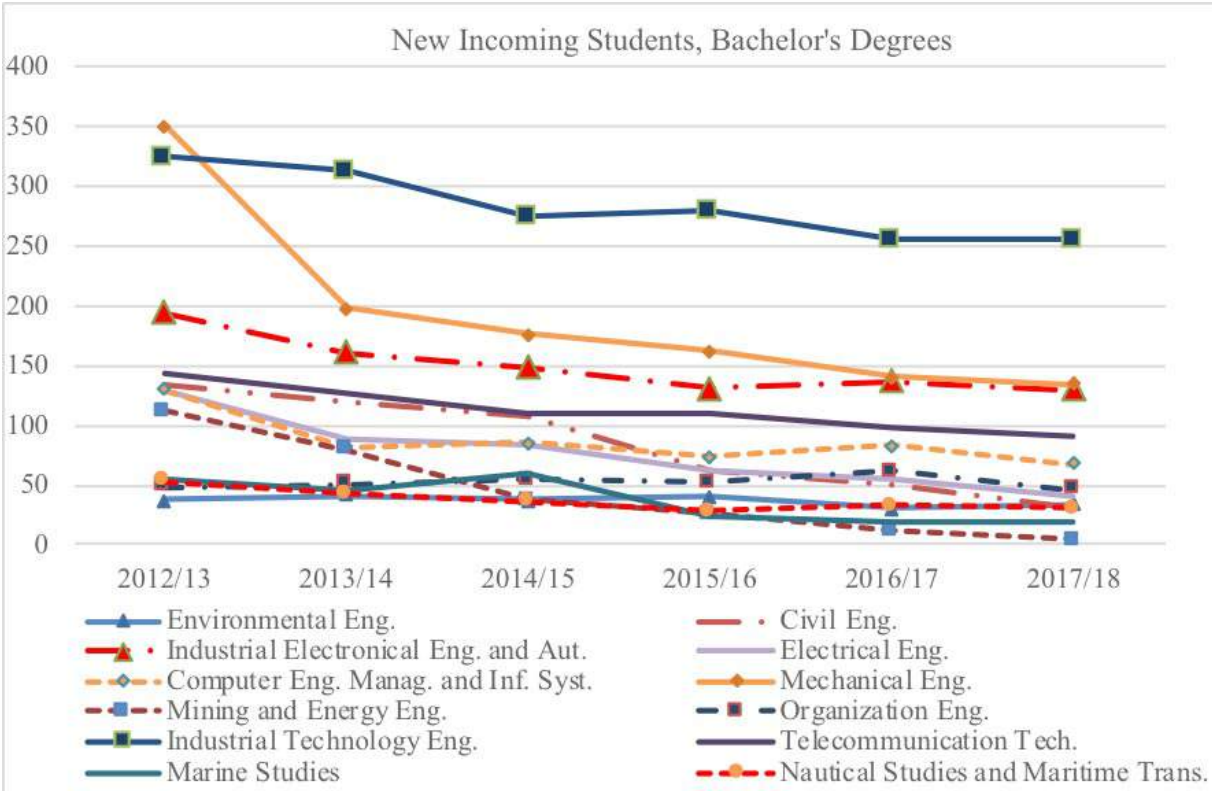
The evolution of new incoming student number in the faculty is an example of decisive interest data. Figure 1 shows the situation in the Faculty of Engineering in Bilbao, Basque Country University in the last years.

The reduction of the engineering student number in many universities is a fact [2], [8]. The reasons, besides the purely demographic one, can be related to the complexity of the studies, to the abstraction that requires the theoretical knowledge in many engineering subjects, to the difficulty for progressing in the grade and finally, to an employment sector with a history of good future prospects not fully achieved. Other example of interesting data for universities is shown in Figure 2, including the women percentage evolution into the engineering studies in the faculty in the last years.

These data would make evolve academic objectives to improve the social vision about the faculties, and in this way, to attract the best talented students.

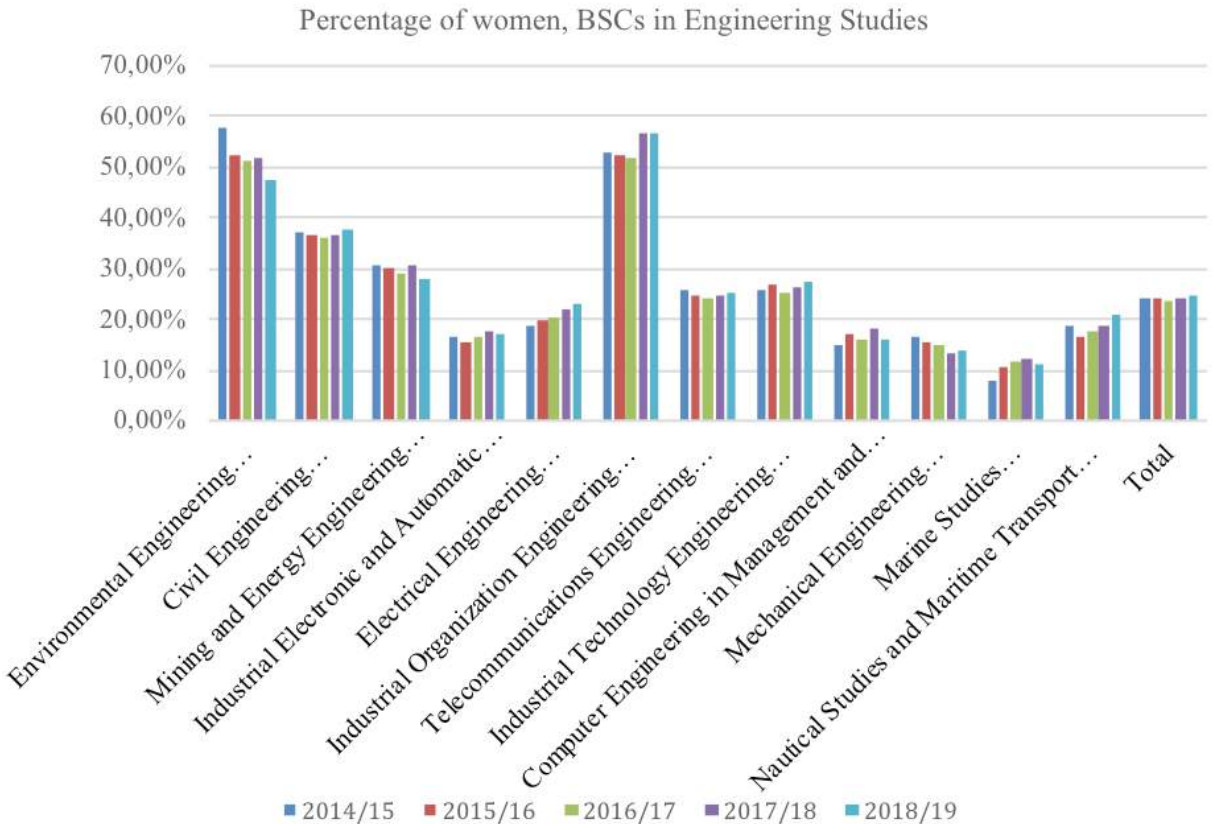
Figure 1

Enrollment interest rate in the Faculty of Engineering in Bilbao



The graph of Figure 2 shows the percentage of women studying in the Bachelors' Degrees in engineering at the Faculty of Bilbao, which remains practically constant over the last few years. The number of women is significantly higher in the Bachelors' Degrees in Industrial Organization Engineering, Environmental Engineering and Civil Engineering. The average value of women remains constant, as shown, going around 24% in the total of the Bachelor's degrees.

Figure 2
Evolution of the percentage of women studying engineering degrees



Novel educational methodologies and environment should be proposed for improvement of the data shown above as example. Project Based Learning (PjBL) and Challenges Based Learning (CBL) methodologies based on industrial and research equipment as didactic scenarios are some attractive solutions. Moreover, both methodology and scenario became a source of interesting evolution data: student interest, theoretical knowledge progression, experimental and technical competencies development, students' teamwork behaviour, social and professional ethic, among others [9], [10].

3. Project Data

Methodology, Scenario, Learning, Time Management, Competencies and Educational Progression are examples of the internal project data which could be assessed, being this assessment based on some on-line short questionnaires, for obtaining quick feedback with on time answer, a final global questionnaire for obtaining a feedback with an overall vision about the teaching and learning process applied. Table I is an example of items for incorporating to these questionnaires.

Table 1
PjBL Key Indicators

Methodology	Scenario
—Motivation —Attention —Participation —Innovation —Teamwork —Individual work —Classroom dynamic —Off-campus dynamic —Social skills: communication, ethics, positive stimulus	—Social and industrial interest —Scenario development —Interaction capabilities —Redesign capacity —Model capacity —Technical adaptation —Future Impact
Experimental indicators	**Educational progression**
—Transfer capability —Experimental learning in simulation —Disassembly activity —Analysis activity —Assembly activity —Microprocessor use	—Teaching and Learning process —Time management —Competencies and learning objectives completed —Overall evaluation of methodology —Interaction capabilities of the scenario

4. Society Data

Finally, as external evidences to measure and share the results there are different independent sources, as example: presentations in international congresses of students and engineering educators, publications in journals of students and engineering educators, and finally, industry and society feedback, [11], [12].

Data collection and sharing results promote the improved vision of both engineering educator and engineering student. This proposal seeks a deep transformation in the daily educational work, looking for a change in teacher and student roles, students more proactive with their own learning, positive change of attitude to self-learning and lifelong learning. These changes are significant due to the fast development of the technological world and the need to incorporate these evolutions in the engineering education.

5. Conclusions

In summary, one of the main issues for improving the SoTL evolution in teaching-learning processes in European universities and in particular in the Faculty of Engineering in Bilbao is related to the capacity of a proper management of the information into the own institutions and their ability to ensure a proper communication to the Industry and Society.

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Experiences of Cognitive Computing in University Classrooms

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Abstract

This paper presents a group of cognitive computational experiences carried out in classrooms of the University of the Basque Country. The experiences were designed to guarantee that the students would learn the content of a set of topics in the areas of education and engineering by using the computational capabilities already present in the human brain. These capabilities are, in general, different from those used in traditional teaching and learning environments. The human brain develops large sets of cognitive processes to manipulate information without any formal education. We call these processes Evolutionary Cognitive Processes. The methodology is based on using primarily the brain's system1 and on offering students a computational model for solving problems through isomorphic tasks. Four experiences were carried out with students of the degree courses in Primary Education, and master's degree in Engineering of Control, Automation and Robotics. The methodology of the experiences is based on the creation and use of a Virtual Machine. The first data indicate good results for students. The paper shares the results and conclusions of these experiences with the academic community in the area of Scholarship of Teaching and Learning.

1. Introduction

The experiences were carried out during the 2018-19 academic year in the Faculty of Education and the School of Engineering of Bilbao as part of an educational innovation project entitled: Application of Cognitive Computing in Education [1]. This project proposes to incorporate the Evolutionary Cognitive Processes (ECP) in the teaching-learning environments of the university.

The experiences have been designed to guarantee that our students would better learn a set of subjects in the areas of education and engineering, using computational capabilities of the human brain different from those used in traditional teaching environments.

1.1. Evolutionary Cognitive Processes

ECP are processes that are developed in a 'natural' way in humans. Such processes include language, image processing, spatial mapping, and object recognition. These processes use the brain's system1. System1 processes information using long-term permanent memory) [2].

In traditional education it is the brain's system2 that is in charge of solving to solve problems or implement tasks. System2 is a serial processor: it is slow, tires easily, interferes with other processes, and has limited computational power [2, 3].

1.2. Virtual Machines and Isomorphic Problems

Our project proposes the creation and use of virtual cognitive machines to solve problems and implement tasks.

A Virtual Machine (VM) is a system or a computational tool that we are able to build in our mind in order to perform cognitive tasks. The tasks vary in nature and complexity: obtaining the result of adding 2 plus 2, designing an autonomous car, or cooking a paella.

The cognitive tasks involve two sub-tasks: 1) to remember (memorize) the variables/ data of the problem; and 2) to compute (process) the variables in order to reach the desired goal. The process of computing can described as rules or operations applied to the data or variables.

The role of a VM is to help implementing these two required sub-tasks: memory (remember) and computation (processing).

The design of the VM includes the use of resources or "cognitive primitives" that the brain has have already acquired in an unsupervised form. These include:

- Objects (we know their properties, their relationships with other objects).
- Relationships (family, geometric shapes, spatial and temporal orientation).
- Patterns (songs, sayings).
- Coding (the information —variables, data— is represented with shapes, words, known symbols).

The technique used to build VMs is through the use of isomorphic problems: equivalent problems represented with different data sets and rules. The isomorphic problems selected for this project are based on a set of cognitive primitives used in the creation of stories. These allow students to easily remember and reproduce data sets and rules.

These Isomorphic problems are designed ad-hoc for each problem to be solved or task to be implemented.

2. Materials and Methods

2.1. Materials

The four experiences implemented in this project have been carried out by students of several courses of the degrees in Primary Education, and master's degree Engineering of Control, Automation and Robotics.

Table I summarizes the subjects, degree, educational center and number of students of the four experiences carried out in the project.

Table I
Experiences and Courses

# Experience	Course	Degree	Centre	Students
#1	Digital Control	Master	School of Engineering	19
#2	New pedagogical scenarios for Digital Learning	Primary Education	Faculty of Education	35
#3	Research of curricular materials	Primary Education	Faculty of Education	40
#4	School organization	Primary Education	Faculty of Education	40

2.2. Methods

The methodology of the experiences includes the following steps: M1) Definition of the task; M2) Definition of its cognitive complexity; M3) Initial proposal for a Virtual Machine (VM); M4) Development of the VM; M5) Development of a method to teach the VM; M6) Students' training with the VM and test; and M7) Evaluation and improvements.

The research team selected four courses and designed the experiences using the methodology described. The execution of each experience in the classroom with the students required different durations and processes according to the subject, its context and availability of the students.

The development of experience #1 included two phases: Phase A – Description of the Isomorph Problem/VM; and Phase B - Practice and Test.

Experiences #2,3,4 were developed in four phases: Phase 1. Contextualization of the experience and understanding of the ECP; Phase 2. Description of the isomorphic problems; Phase 3. Development of an isomorphic problem of Primary Education; and Phase 4. Students identify and describe isomorphic problems for a task in their curriculum in primary education that they consider are repetitive and therefore ideal targets for a common strategy to deal with them.

Table II summarizes the characteristics of each experience.

Table II
Students and Courses

# Experience	Task & VM	Phases	Method and Materials	Time
#1	— Expansion of a multiple pole to calculate the Inverse Z Transform — *Méxicolandia*	— Phase A and B	— Self-explanatory slides — Google Form	45 min
#2	— Internalization of pedagogical design — *Hand-EGEME*	— Phase 1, 2, 3 and 4	— F2F — Slides — Google Form	4 hours
#3	— Conceptualization of technique, strategy and method — *Gladiator*	— Phase 1, 2, 3 and 4	— F2F — Slides — Google Form	4 hours
#4	— Conceptualization of technique, strategy and method — *Gladiator*	— Phase 1, 2, 3 and 4	— F2F — Slides — Google Form	2 hours

Steps M3 and M4 of the proposed methodology are, obviously, those requiring the greatest dedication of time and effort. Figures 1 and 2 show, partially, the coding of the data and rules of the VMs developed for Experience # 1 and Experience # 2.

Figure 1
VM for Experience #1

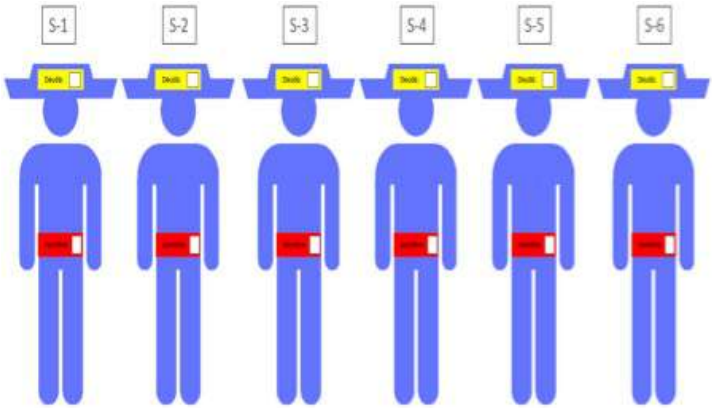
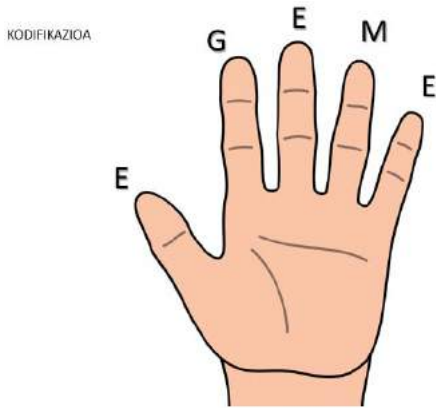


Figure 2
VM for Experience #2



The development of the experiences was carried out in laboratories with computers as well as in open spaces of the School of Engineering and the Faculty of Education. Figures 3 and 4 show students participating in different moments of the experiences.

Figure 3
Students in Experience #1

Figure 4
Students in Experience #2

3. Results

The experiences concluded with the step M7 dedicated to the evaluation of the experience. The experiences were evaluated using Google forms to collect feedback on aspects of usability and satisfaction. The instrument used included descriptive questions

about the students followed by questions related to the use and the perceived effectiveness of the VM (measured on a Likert scale).

The initial results of these experiences indicate that students: 1) retain concepts in long-term memory with immediate and automatic access; 2) manipulate the data in a parallel, reliable and effortless mode; 3) can explain to themselves and other students the processes used to reach their decisions; 4) They have no difficulty in learning VMs; and 5) they find them easy to use.

Acknowledgments

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Dokumentu konputazionalak: ikasteko modu berriak

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Laburpena

Unibertsitate graduetan, metodologia aktiboen erabilera hedatzen ari da, baina oraindik ere horretan sakondu beharra dago. Izan ere, metodologia aktiboen bidez ikaslearen inplikazio-maila handiagoa eta ikasketa prozesua aberatsagoa da. Dena den, ondo irakastea zaila da eta irakaslearen papera funtsezkoa gertatzen da. Kalitatezko edukiak diseinatzea oinarrizkoa da: horretarako, adibide onak aukeratu eta edukiak ondo antolatu behar dira. Helburu honetan, teknologia berriek aukera asko eskaintzen dizkigute, eta modu egokian aplikatuz gero, metodologiaren tresna osagarri bilaka daitezke. Dokumentu konputazionalak komunikatzeko nahiz ikasteko tresna dira. Dokumentu hauetan, ohiko testu, irudi eta formulazio matematikoak konputazio kodearekin konbinatzen da. Teknologia honekin, irakasleari ikasgelan edukiak lantzeko leiho berri bat irekitzen zaio, eta irakaskuntza esanguratsuagoa sortzen laguntzen du. Hainbat unibertsitatetan ibilbidea hasia dute, eta dokumentu hauen bidezko irakaskuntza zabaltzen ari da. Informatika Ingeniaritzako graduko *Zientziarako Konputazioa* ikasgaian izandako esperientziaren zehaztasunak emango ditugu.

Abstract

At university degrees, although the use of active learning methodologies is growing, it is very desirable to use them more. Thereby, the student is more involved, increasing motivation and enriching the process of learning. Anyway, teaching well is difficult and teacher's role becomes essential: quality content should be designed, presenting good examples and giving clear theoretical knowledge. For this purpose, new technologies offer us new ways for teaching and learning that can be suitable to support active methodologies. Computational Notebook is an interesting tool to communicate facts and ideas: educators explain new concepts using these documents and students can apply them dynamically. There are three kinds of information that can be used to create a Computational Notebook: simple text, computational code and the output (mainly in visual form). We believe that incorporating Computation Notebooks for higher education could allow us to increase student performance and engagement. In the present work, we will show a teaching experience in undergraduate computer science at the Computer-Engineering faculty (UPV/EHU).

1. Sarrera

Unibertsitate-hezkuntzako metodologia aktiboen artean, problemetan oinarritutako ikaskuntza, bestei erakustea, talde-eztabaida edo gela iraulia izeneko teknikak erabiltzen dira. Metodologia hauen bidez, ikaslearen parte-hartze aktiboa eta ikaslearen autonomia bultzatzen dira. Inolako emoziorik gabe buruz ikasitakoa erdipurdiko ezagutza da eta, gainera, berehala ahaztuko dena [1]. Ordea, zerbaitek harridura edo interesa sortzen badigu, denbora luzez gogoratuko dugu eta ikasitakoa aplikatzeko gai izango gara. Dokumentu konputazionala komunikatzeko tresna berri bat da, ikastea deskubritzea den ideiarekin bat egiten duena. Ikasgelan dokumentu hauen erabilerak ikasleei edukien ulermena hobetzen, ikasgaiarekiko interesa pizten eta eduki esanguratsuagoak sortzen laguntzen die [6].

Teknologia honekin, irakasleari ikasgelan edukiak lantzeko leiho berri bat irekitzen zaio. Testu, irudi eta formulazio matematikoak konputazio kodearekin eta hauen emaitzekin kon-

binatzen direla esan genezake dokumentu hauen ezaugarri nagusia dela (1. irudia). Datuei eta konputazioari loturiko konputazio atal hauek [11,7], ikasleak modu dinamikoan ebaluatuko ditu eta ikaskuntza eraginkorragoa izan dadin lagunduko du. Hain zuzen ere, esperientziak erakutsi du konputazio interakzio hauek ikasleak kontzeptuen ulermenean izan ditzakeen hutsuneak gainditzeko oso baliagarriak direla [10,12].

1. irudia

Pilotaren erorketaren simulaziorako konputazio-dokumentuaren adibidea. Dokumentua hiru informazio mota konbinatuz osatzen da: testua, konputazio kodea eta emaitzaren grafikoa. Pilotaren altueraren eboluzioaren adierazpen grafikoa oso esanguratsua dela azpimarratu behar da

6-Pilota baten erorketaren simulazioa

Atal honetako helburua, pilotaren erorketaren simulazioaren lurraren kontrako inpaktua irudikatzea da. Pilotak lurraren kontra jotzen duen unean, abiaduraren norabidea aldatu eta %10 gutxitzen dela suposatuko dugu.

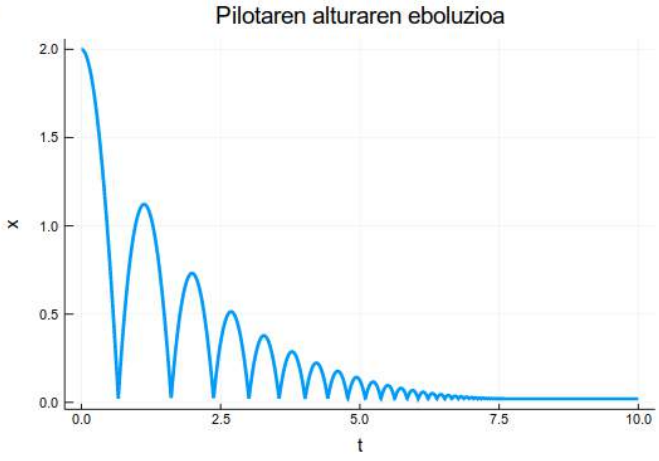
- Aurreko ataleko RK4step funtzioa aplikatu (adbz 2400 alditan deitu).
- Pilotaren x altueraren eboluzioa t denboran irudikatu,

```
In [27]: n=2400
         res2 = RK4(u0, t0, tF, n, fpelota, gSuelo, rbote, p)

         tt = res2[:,1]
         xx = res2[:,2]
         vv = res2[:,3]

         plot(tt,xx,title="Pilotaren alturaren eboluzioa",xlabel="t", ylabel="x",label="",lw=3)
```

Out[27]:



Azken urteetako teknologia hauen garapen handiari esker tresna hauek nolabaiteko heldutasun maila lortu dutela uste dugu, eta etorkizun hurbilean teknologia hauen erabilera orokortuko dela aurreikus daiteke [11]. Tresna hau ezagutza eremu zabal batean (Zientzia, Ingeniaritza, Fisika, Ekonomia...) aplika daitekeela pentsatzen dugu, eta oker deritzogu tresna honen erabilera arlo teknologikoei dagozkien irakaskuntzetara soilik mugatzeari. Hortaz, tresna hauen erabilerak unibertsitate hezkuntzara jauzia egiteko eta ikasgelan baliagarria den aztertzeko unea iritsi dela esango genuke. Hainbat unibertsitatetan ibilbidea hasia dute eta dokumentu hauen bidezko irakaskuntza zabaltzen ari da [6].

2. Esperientzia bat

2017-2018 ikasturtean, Informatikaren Ingeniaritzako Graduko *Zientziarako Konputazioa* ikasgaian dokumentu konputazionalen bidezko irakaskuntzari hasiera eman zitzaion. Ikasgai honetan, zientzian eta teknologian azaltzen diren problema matematiko gehienen ebazpenerako ezinbestekoak diren zenbakizko metodoak aztertzen dira. Bi motatako saio presentzial ditugu: (1) saio magistraletan, eduki teorikoak lantzen dira; (2) laborategiko saioetan (ordenagailuaren aurre-aurreko saioak), problemetan eta azterketan oinarritutako ikaskuntza aplikatzen da, zenbakizko metodoen azterketa esperimentala lantzeko.

Laborategi saioetako konputazio-dokumentuetan, azalpenak erantzun behar diren konputazio ariketekin tartekatzen dira. Ariketen ebazpenerako, ikasleari metodo baten inplementazioa (gure kasuan, Julia programazio lengoaian [3]) osatzeko eskatzen zaio, eta egin beharreko lanaren konplexutasuna modu inkrementalean handituz joaten da. Lanak modu inkrementalean planteatzen direnez, argi dago ikasle batek eginbeharra ulertzeko ahalegina egin ezean hurrengo eginkizunak nekez egin ahal izango dituela. Estrategia honekin, ikaslearen autonomian eta haren sormenean eragin nahi da: ikasleak, ariketa berri bat egiteko, derrigorrez aurreko urratsak ondo ulertu behar ditu, eta zeregin honen ardura harena da. Inplementazio hauen bidez, ideia matematikoa emaitzak lortzeko tresna bilakatzen da, eta honek ikasleak kontzeptua ondo menperatzen duela ziurtatzen du, gerta daitezkeen ulermen hutsuneak agerian uzten baititu. Ikasleak esperimentalki egindako lana zuzena den ala ez frogatzen duenez, urrats hauek guztiak lagungarriak dira, ikaslearen motibazioa pizteko eta irakaskuntza eraginkorragoa izateko.

Konputazio interakzio hauek duten ahalmena ilustratzeko, pendulu arruntaren eredu matematikoaren simulaziorako (2. irudia) aplikatutako metodoaren azterketaren adibidea azalduko dugu. Ikasleari, soluzio bat egokia den erabakitzeko, penduluaren mugimenduaren animazioa zein neurritan erreala gertatzen den aztertzea eskatuko zaio. Lehen urratsean, ikasleak metodoa aplikatuz penduluaren mugimenduaren animazioa ezinezkoa dela konprobatuko du; hau da, penduluaren mugimendua airearen marruskaduraren eraginez motelduz joan beharrean, gero eta mugimendu azkarragoa gertatuko da. Beraz, soluzio honen errorea handiegia dela (3. irudia) eta onargarria ez dela ondoriozta daiteke. Bigarren urratsean, errorea txikitzeko konponbidea proposatuko zaio, eta oraingoan, lortutako penduluaren mugimenduaren animazioa erreala gertatuko da. Dudarik gabe, ikasleak eraikitako konputazioek, esperimentalki eta penduluaren mugimenduaren animazioez lagunduta, eduki teorikoak ondo ulertzen laguntzen dute [12].

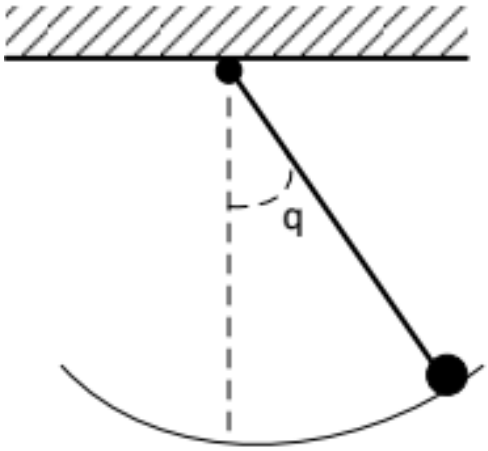
Jakina da irakaskuntza on baten gakoetako bat kalitatezko edukiak lantzea dela. Horretarako, adibide onak aukeratu eta edukiak ondo antolatu behar dira [9]. Ikasgaian, eredu matematikoen zenbakizko simulazioak konputatzeko teknikak lantzen dira, eta gure irizpidea, edukiak antolatzeari dagokionez, teknika sinpleenetik konplexuenerainoko hari bat osatzea da. Mugimenduari loturiko eredu matematiko ulergarriak (pilota grabitate eremuan erortzea, penduluaren mugimendua, satelitearen mugimendu orbitala,...) aurkezten dira, eta une bakoitzean, teknikaren ezaugarriak hobekien azaltzeko eredu matematiko egokiena aukeratzen da. Horrela, teknika bakoitzaren desabantailak eta indarguneak azalduz, mezu koherente bat osatzen saiatzen gara.

Ebaluazioak ikasleak ikasten duen moduan eragin handia duela jabetuta [2], ebaluazio hezitzailearen kontzeptuaren inguruko ideiak aplikatzen saiatu gara. Ikasleen arabera, ikastaro onenen berezitasuna bigarren aukera ematea da, eta horretarako, lanak bi aldiz zuzendu behar dira: lehenengoa, akatsez informatzeko; bigarren bertsioa, kalifikatzeko. Aurreko ideia moldatuz, ezarritako ebaluazio sisteman, ikasleak laborategi saioaren lanaren

aurkezpena bi alditan egiten du. Lehen aldiko aurkezpena egin ondoren, ikasleari emaitza zuzenak jakinaraziko zaizkio, eta lanaren bigarren bertsio bat, akatsen autozuzenketak arrazoituz aurkezteko eskatuko zaio. Modu honetan, irakasleak, ikasketa prozesuaren jarraipena eta kalifikazio egokia zehazteko, bi bertsioak erabiliko ditu. Helburua ebaluazio sistema honekin ikasleak bere akatsetatik ikastea eta ikaskuntza prozesuaren ardura bere gain hartzea da.

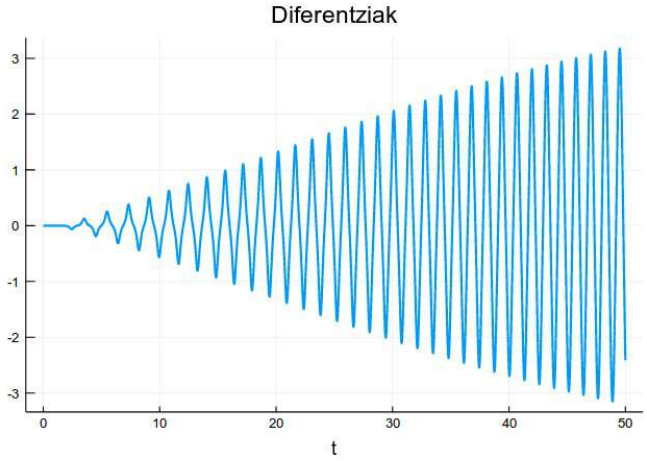
2. irudia

Pendulu arruntaren problema: pendulua planoan mugitzen da, eta egoera aldagaiak ardatz bertikalarekiko angelua eta abiadura angeluarrak dira



3. irudia

Penduluaren bi soluzioetako angeluen arteko diferentzia. Denbora aurrera doan neurrian diferentzia handitzen doa eta soluzioa fidagarria ez dela adierazten du



Hitz gutxitan esanda, metodologia honekin, ikaslearen papera aktiboa bultzatu nahi dugu. Hauek dira deskribatu dugun irakaskuntzaren ezaugarri nagusiak:

— **Problemetan eta azterketan** oinarritutako ikaskuntza.
— **Esperimentazioak** ikaslearen **motibazioa** eta **interesa pizten** du.
— Eredu matematikoen **simulazioak**: teoriaren eta errealitatearen hurbilketa.
— **Ekinez ikasi** ... eta akatsetatik ikasi.
— **Irakaskuntza sakona** eta **esanguratsua**.
— **Sormena eta zeharkako gaitasunen** lanketa.

3. Ondorioak

Ezagutza arlo batzuetan konputazioari buruzko ezaguerarik eza dela-eta, era honetako tresnak aplikatzeko, eragozpenak eta zailtasunak aurreikus daitezke. Baina arlo horietan ere tresna hauei etekina atera dakiekeela eta interesgarriak direla sinetsita gaude. Esaterako, gizarte zientzien arloan, simulazioak tresna baliagarriak dira, eta irakaskuntza modu berritzailean aplikatzeko bideak irekitzen dituzte [14]. Gainera, zailtasun hauek irauliz, eta etorkizun laburrean edozein arlotan konputazio ezaguera beharrezkoa izango den ustean [6,7], tresna hauen erabilera gaitasun hauek lantzeko aukera gisa aurkez daiteke.

Azken mezu honetan, gure burua mezu teknologoetatik urrundu nahiko genuke: teknologia ez da irakaskuntza ereduaren erdigunea izan behar [1], aplikatutako metodologia baizik [8]. Teknologiak, metodologia aktiboaren tresna osagarria izan behar du, eta ez alderantziz. Ohiko akatsetako bat teknologian gehiegi itsutzea dela iruditzen zaigu, eta bide honetatik emaitza txarrak lortuko ditugu. Egia da, metodologia aktiboek abantailak azaltzen dituztela [13], baina metodologia hauen inplementazioa egokia ez bada, metodologia pasiboak baino okerragoak izan daitezke[1]. Hori dela-eta, ardura handiena eduki onak nahiz pedagogia eraginkorra diseinatzen eman beharko genuke.

Open-source teknologiak

Dokumentu konputazionalak sortzeko, Julia[3] konputazio lengoaia berriak eta Jupyter [4] tresnak eskaintzen diguten ingurunea gomendatuko dugu. Tresna hauek open-source software proiektuak dira, eta JuliaBox [5] webguneak teknologia hauen ezarpena asko errazten duela nabarmendu behar da.

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Diseño de un sistema de evaluación reflexivo en prácticas para estudiantes de las carreras de salud

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Abstract

The present work contemplates the design of a virtual platform for the implementation of a digital portfolio built together with professional guides, clinical field teachers and students; incorporating the registry of critical incidents, as a method of evaluation in the practices. At present, the professional practices are evaluated by academics and teachers in the clinical field through rubrics with the levels of competence expected according to the graduation profile. This process, although it considers the feedback to the student, does not consider the reflection during the whole process of both the academic and the student. The collection of the information for the design was done through the technique of focus groups in which participated: practice coordinators, teaching instructors, tutors of the training centers and students. Through this work as expected result will contribute to the teaching-learning process of students, as well as the installation of more democratic and reflective teaching practices where consensus is achieved and learning through constructive error with a view to ethical professional development and responsible with the regional environment through the use of the digital portfolio with registration of critical incidents as a tool for evaluation, evidence and reflection in Student Practices of health careers.

Resumen

El presente trabajo contempla el diseño de una plataforma virtual para la implementación de un portafolio digital construido conjuntamente con profesionales guía, docentes de campo clínico y estudiantes; incorporando el registro de incidentes críticos, como un método de evaluación en las prácticas. Actualmente las prácticas profesionales son evaluadas por académicos y docentes de campo clínico a través de rubricas con los niveles de competencia esperados acordes al perfil de egreso. Este proceso si bien contempla la retroalimentación al estudiante, no considera la reflexión durante todo el proceso tanto del académico como del estudiante. La recolección de la información para el diseño se realizó mediante la técnica de grupos focales en los cuales participaron: coordinadores de prácticas, docentes instructores, tutores de los centros de formación y estudiantes. Mediante el presente trabajo como resultado esperado se contribuirá al proceso de enseñanza-aprendizaje de los estudiantes, Así como a la instalación de prácticas docentes más democráticas y reflexivas donde se logre el consenso y aprendizaje a través del error constructivo con miras a un desarrollo profesional ético y responsable con el entorno regional a través del uso del portafolio digital con registro de incidentes críticos como herramienta de evaluación, evidencia y reflexión en Prácticas de Estudiantes de las carreras de salud.

1. Introducción

En este artículo se presentan los principales hallazgos, resultado de una investigación sobre innovación educativa para el desarrollo de un sistema de evaluación integral y participativo. Se desarrolló en las carreras de Medicina, Fonoaudiología e Ingeniería Biomédica de la Escuela de Medicina y Ciencias de la Salud de una Universidad Privada. Se pretende que el proceso de evaluación de las prácticas profesionales, se transforme en una práctica de evaluación formativa, auténtica y compartida, incorporando el uso de portafolio digital y regis-

tro de incidentes críticos, comprendiendo que el alumnado no aprende con los procesos de calificación, sino con los de evaluación (Hamodi, Lopez Pastor, & Lopez Pastor, 2015)

En la actualidad, la evaluación de las prácticas profesionales, se utilizan instrumentos en formato impreso o digital, donde el docente instructor y docente tutor, completan las rubricas y/o planillas de evaluación en formato Excel, que consideran la autoevaluación del estudiante y evaluación de los docentes. Éstas, son enviadas al coordinador de prácticas, quien es el encargado de centralizar la información y registrar las notas en la plataforma institucional. Sin embargo, se pretende avanzar hacia un sistema digitalizado integral, que no solo muestre la nota, sino que permita la comunicación entre todos los actores involucrados y registrar las observaciones y reflexiones del proceso de prácticas.

Los estudiantes se convierten en protagonistas principales de su proceso de enseñanza-aprendizaje, de forma reflexiva y crítica, estableciendo un sistema de retroalimentación dirigido por el profesor, reconociendo el error como una oportunidad de mejora que se reflexiona en conjunto para reorientar los aprendizajes. Se diseñó una propuesta de modelo de evaluación de prácticas profesionales a través de plataforma digital Moodle, basándose en la implementación de un portafolio y registro de incidentes críticos, con participación de docentes instructores, docentes tutores. Coordinadores de prácticas y Estudiantes y su posterior validación con profesionales guía, docentes tutores y coordinadores de práctica

La investigación pretende favorecer el proceso de enseñanza-aprendizaje mediante el uso de un portafolio digital con registro de incidentes críticos como herramienta de evaluación, evidencia y reflexión en Prácticas Curriculares y Profesionales de Estudiantes de las carreras de salud.

2. Método

El método utilizado en la investigación es cualitativo con un diseño de acción participativa. La selección de los participantes de la investigación obedeció a un muestreo intencional el cual se desarrolló en dos fases: En la primera fase los investigadores presentaron la investigación a directivos, referentes hospitalarios y estudiantes de las carreras seleccionadas de la Escuela de Medicina y Ciencias de la Salud, luego se seleccionaron a los participantes con los siguientes criterios:

1. Docentes que participan en la asignatura de Prácticas Profesionales (Coordinadores de Prácticas, Docentes Instructores de Prácticas, Referentes Hospitalarios).
2. Estudiantes que se encuentren cursando la Asignatura de Práctica Profesional y/o Internado.

La participación fue de forma voluntaria. La muestra total es de 29 Participantes. Se aplicaron 6 grupos focales, previa lectura y firma del consentimiento informado, en las Carreras de Medicina, Fonoaudiología y Biotecnología de la Escuela de Medicina y Ciencias de la Salud de una Universidad privada de Colombia.

El Protocolo de los grupos focales fue elaborado en base a la estructura básica de un portafolio establecida por (Barberá & De Martín, 2011)y estuvo constituida por 5 categorías de ejes de conversación, 16 subcategorías y sus respectivos ejemplos de preguntas generadoras de conversación. El protocolo fue validado previamente por referentes nacionales e internacionales de una Universidad Pública y Estatal del Sur Chile, Una Universidad Pública y Estatal del Norte de Chile y una Universidad Privada de Colombia.

La selección de los participantes para los grupos focales se realizó de dos maneras:

— Docentes: Participaron aquellos docentes que realizan funciones académicas en las prácticas Profesionales y Docentes de campo clínico. Cada grupo focal realizado quedó compuesto por un promedio de 6 docentes de cada programa.
— Estudiantes: Se seleccionaron estudiantes que se encuentran cursando su práctica profesional. Cada grupo focal realizado está compuesto por un promedio de 6 estudiantes de cada programa.

Los grupos focales se realizaron de manera separada por programa en grupos de docentes y estudiantes, durando en promedio 45 minutos cada uno.

El análisis de los datos se realizó Grupos Focales: Los grupos focales trascritos fueron codificados y analizados a través del programa ATLAS.ti 8.0, 20.0.

El diseño del portafolio fue construido de manera participa, tomando como base a la estructura básica de un portafolio establecida por los autores (Barberá & De Martín, 2011).

3. Resultados

El aprendizaje en los escenarios de práctica profesional o internado es asociados en el análisis del discurso de los estudiantes a los conceptos de: reflexión, retroalimentación, sentimientos y emociones, evaluación actitudinal e incidente crítico. El incidente crítico como una forma de aprendizaje significativo para los estudiantes, relacionándolo con todos conceptos de aprendizaje mencionados. El incidente crítico es asociado por estudiantes y docentes a eventos adversos que se relacionan directamente con el paciente en la práctica clínica y en las relaciones interpersonales con los equipos de trabajo. La retroalimentación y la evaluación actitudinal son muy valoradas en el aprendizaje de los estudiantes mencionado que permiten la modificación o cambiar aspectos actitudinales y/o cognitivos a desarrollar en los escenarios prácticas y como se cita de forma textual es directamente asociado con la formación profesional *:"Uno de los aspectos que es muy importante y que favorecen mucho las evaluaciones es la parte cualitativa y que también hace que uno como estudiante no solo se centre en lo cuantitativo, si no en la nota por decirlo así, sino también en la parte cualitativa que es formar al profesional".*

Al analizar el discurso de los estudiantes, los conceptos de sentimientos y emociones relacionadas con los escenarios prácticos, presentan una concurrencia de un 17%, destacando la frustración, schock emocional y empatía. Para los estudiantes, los sentimientos y emociones que puedan sentir en los escenarios prácticos se relacionan directamente con su calificación y desempeño. La calificación final de la práctica se asocia con la afinidad y empatía que sienta con el docente. En el análisis del discurso de los docentes existe ausencia de la co-concurrencia de dichos conceptos.

El portafolio digital está asociado a los conceptos de aprendizaje, incidentes críticos, evaluación, reflexión y retroalimentación asumiéndose como parte del portafolio la incorporación de recursos tecnológicos. Por lo que el portafolio digital se visualiza como una herramienta que favorece el aprendizaje significativo de los estudiantes. Los sentimientos y emociones relacionados con los escenarios prácticos son asociados con el aprendizaje de los estudiantes y el portafolio se visualiza con un instrumento que permite reflexionar sobre los sentimientos y emociones ocurridos en la práctica.

4. Conclusiones / reflexiones

El diseño participativo en el cual se incluyen todos los actores involucrados en el proceso de práctica, nos permite tener una mirada integral desde los proceso de administración, gestión, académicos, referentes de los centros de prácticas y un enfoque central en los estudiantes en donde se convierten en protagonistas principales de su proceso de enseñanza-aprendizaje, de forma reflexiva y crítica, estableciendo un sistema de retroalimentación dirigido por el profesor, reconociendo el error como una oportunidad de mejora que se reflexiona en conjunto para reorientar los aprendizajes.

Se puede concluir que el diseño propuesto de portafolio digital es una herramienta útil que favorece el aprendizaje significativo en los escenarios prácticos, permitiendo integrar todos los elementos significativos que los estudiantes relacionan con aprendizaje tales como: reflexión, retroalimentación, sentimientos y emociones vivenciados en la práctica y análisis de los incidentes críticos. Para que los estudiantes logren un mayor nivel de análisis y reflexión en los escenarios prácticos, se deben incluir estrategias de enseñanza-aprendizaje que favorezcan estos procesos a lo largo del currículo. La retroalimentación y la evaluación actitudinal, son asociados con la formación profesional y permiten modificar o cambiar aspectos actitudinales y/o cognitivos a desarrollar en los escenarios prácticos.

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Creating a Collection of Books on Teaching Innovation as a Driver of Teacher Professional Development at the University of Deusto

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Abstract

This paper presents an experience carried out in the Teaching Innovation Unit of the University of Deusto in relation to the creation of a collection of impact publications on Teaching Innovation as an engine for the professional development of teachers. From the "good practices" implemented and presented by the teachers in the annual conference of teaching innovation of the university, the faculty is given the opportunity to participate in the elaboration of a chapter for an impact work. This highlights the importance of educational research as a permanent process of professional development, allowing teachers to deepen into the conceptual frameworks that underpin their practices, in order to transform them and improve them for the benefit of student learning. In addition, this initiative arises with the interest of encouraging and granting recognition to teachers who participate in teaching innovation activities and projects, through the possibility of making impact publications for their curriculum. The paper explains the selection criteria for the works, the conditions and requirements that the chapters must meet, the functions of the editorial team, the revision and improvement processes followed with the teachers, the lessons learned and the difficulties encountered. It is an innovative experience that has been very well received by teachers and has served the teaching unit itself to train and deepen research as a means of professional development (SoTL) as well as to disseminate the work being done in the framework of the unit.

1. Introduction

It is becoming increasingly difficult for teachers to maintain a balance between the requirements of teaching and management, and the demands of research (Hattie and Marsh, 1996). This communication presents an experience carried out in the Teaching Innovation Unit of the University of Deusto in relation to the creation of a collection of impact publications on Teaching Innovation as an engine for the professional development of teachers.

From the "good practices" carried out and presented by the teachers in the annual conference of teaching innovation of the university, the faculty is given the opportunity to participate in the elaboration of a chapter for an impact work. This highlights the importance of educational research as a permanent process of professional development, allowing teachers to deepen into the conceptual frameworks that underpin their practices, in order to transform them and improve them for the benefit of student learning.

2. Description of the initiative

2.1. The initiative of creating a book

As Healey (2005, p. 67) points out "Much of the international debate about the relationship between research and teaching is characterised by difference. Individuals vary widely in their views about the nature of the linkage. Some believe that university research often detracts from the quality of teaching, while others argue that courses taught by those at the cutting edge of research will necessarily be of higher quality than those taught by those merely using the research results of others – whatever the apparent quality of their style of delivery. These strong views in part reflect the importance of linking research and teaching in the identity of many academics".

This initiative arises with the interest of encouraging and granting recognition to teachers who participate in teaching innovation activities and projects, through the possibility of making impact publications for their curriculum. Much time and effort has been devoted to trying to prove an empirical link between research activity and teacher performance. In general, the correlations between these two factors have been shown to be poor (Brew & Boud, 1995).

In these pages we present a proposal on how to link teacher innovation practices and a publication that focuses on educational innovation. Logically, it is not an exempt learning process for teachers. The reality with which we find ourselves is that of a professor of engineering, law or international relations, as an example, who shares his/her good teaching practice at the university annual Educational Innovation Conference. Once the Conference has taken place, all the good practices are analysed by an evaluation committee and an invitation is made to the selected teaching staff to write a chapter that includes an introduction, theoretical framework, explanation of the good practice, conclusions and bibliography.

This exercise, which they are invited to do, of reviewing the literature around a pedagogical theme (e.g. use of forums, flipped classroom, online tutoring, project-based learning) results in the end in the teaching staff better understanding of teaching practice, not only from intuition, but also from literature analysis and reflection. When the "good practice" is done in pairs/groups this becomes a rich collaborative construction.

Although in the following section we explain the process followed, the selection criteria of the works, the conditions and requirements that the chapters must fulfill, the functions of the editorial team, the review and improvement processes followed with the teachers, the lessons learned and the difficulties encountered, it is important to point out that the most relevant thing is the process of accompanying the authors from the initial moment until publication.

Taking teaching as one of the dimensions of research, inherent to university work, implies a relevant and productive way of promoting teaching, which in parallel requires institutional recognition and support. In turn, teaching practices should be contrasted and discussed with colleagues, as in the case of the investigation. Here, too, a whole individualistic tradition of teaching work at the university is a barrier, which requires organizational changes (Caballero and Bolivar, 2015). Initiatives as the one presented in this paper, contribute to empower teachers and socialize and recognize their teaching practice.

Following Gamboa (2017), for many teachers part of the knowledge that justifies their pedagogical actions is difficult to access due to its tacit nature. Teachers do not usually

perceive the need to make this knowledge explicit. This implies the lack of a common vocabulary about the didactic reasons that justify pedagogical work. Although teachers share innovation activities and teaching procedures, they do not devote time to reasoning about the pedagogical reasons behind them. In addition, the growing intensification of teaching work in the university reduces the possibility for teachers to carry out collective processes of reflection that allow them to articulate and explain their experiential knowledge so that it can be examined and shared. The proposal that we make in these pages aims to alleviate some of these problems that Gamboa (2017) presents.

Given that we have already dealt with this process on two occasions, we can affirm that this experience has a great impact on the motivation and learning of teachers. In addition, they point out as positive elements that participating in writing a book chapter on their teaching practice allows them to disseminate among colleagues from other universities their own teaching innovations in the development of their subjects.

It is an innovative experience that has been very well received by teachers and has served the teaching unit itself to train and deepen research as a means of professional development (SoTL) as well as to disseminate the work being done in the framework of the unit.

2.2. The process

In the following table *(Table 1)* we describe the process that we carry out in the University of Deusto, to generate a publication of impact, from the "Annual Conference on Teaching Innovation" that takes place in the aforementioned university.

3. Conclusions

Today there is a great tension between teaching and research for the teaching staff as a whole. Devoting time to teaching innovation is important, but sometimes faculty feel they would have to spend those hours publishing in their professional field. With the example given in these pages, we want to show how a Conference on Teaching Innovation can revert to a merit of research for the teaching staff.

Furthermore, we are convinced that thanks to the review of the literature that teachers have to do in order to be able to write a book chapter on innovation practice, it has an important impact on the reflection of teachers, and finally on their quality as teachers.

Table 1
The process

Phase	Period of time	Explanation
Annual Conference on Teaching Innovation	2 months	The call for the "Conference for the Presentation of Teaching Innovation Practices" is communicated to all faculty at the University of Deusto, and is also announced on the website, several months in advance. It takes about two months from the annual conference event to the selection of best practices and invitation to participate in the chapter writing.
Selection & Invitation to participate	4,5 months	The criteria we have in consideration for the selection of good practices are the following: - Adjustment of the "good practice" to the specific topic of the conference. - Quality of the "good practice", response to the template given and use of current references. - Educational, innovative and reference nature of the "good practice".
First submission	2,5 months	The faculty whose innovation practice has been selected writes a chapter with the following parts: - Introduction (1-2 pp.) - Theoretical framework (6-8 pp.) - Brief description of the "good practice" (1-2 pp.) - Conclusions (1-2 pp.) - References (APA, 6th ed.) (1-2 pp.)
First revision	2,5 months	The scientific committee reviews the chapters in detail and gives individualized feedback to the authors on the following issues: adaptation to the indicated script, correctness of the theoretical framework, quality of the review of the literature, compliance with the APA rules, extension, spelling or grammatical errors to be corrected, etc.
Second submission	1 month	Teachers have time to correct chapter errors, or if necessary improve the focus and content.
Second and last revision by teachers	1,5 months	The scientific committee reviews the chapters in detail and gives individualized feedback to the authors.
Final revision by teaching innovation unit and submission to publisher	1 month	The entire book is reviewed by the scientific committee.
Publication	5 months	It is important to select a publisher that is considered prestigious for faculty. In our case, we review in detail the list proposed by SPI (Scholarly Publishers Indicators).

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Zigorra Haur Hezkuntzako Gradutik behatuaz: etorkizuneko erronkak

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Laburpena

Lan honek bilatzen du, batetik, euskal eskoletan eta bereziki haur-hezkuntza mailan zigorra erabiltzeari buruzko erradiografia egitea eta, bestetik, Haur Hezkuntzako Graduko ikasleek erronka honi nola aurre egiten dioten aztertzea beraien etorkizun profesionalaren ikuspuntutik. Horretarako, Haur Hezkuntzako 101 gradu ikaslerekin batera lan egin zen, ikasleei ikerkuntza honetako partaidekide (Students as partners) izateko proposatuaz. Emaitzek adierazi zuten ikasleek bai zigorra eta baita mehatxu mota ezberdinak ere behatu zituztela, eskoletan ohiko teknika gisa deskribatuaz, bereziki pentsalekua. Halaber, aplikatutako zigorraren nolakotasunean patroi zehatzik definituta ez zegoela ere behatu zen, beronen inguruko oinarri psikologikoen falta islatuaz. Azkenik, beren burua ez zuten gai ikusten zigor gabe lan egiteko, eta gatazkei aurre egiteko bestelako tekniketan formatu beharra zutela sentitzen zuten. Bukatzeko, lortutako emaitzen hezkuntza inplikazioak eztabaidatuko dira.

Abstract

This work has two main objectives. On the one hand, to make an analysis of the use of punishment in Basque schools, specifically in the infant or preschool stage. On the other hand, to know how the students of the early childhood education face this issue thinking about their future professional practice. For this, we collaborated with 101 students of the degree of Early Childhood Education proposing them to be co-participants of this research (Students as partners). The results revealed that students in their practices observed different types of punishment and threats, describing them as very common techniques in schools, especially the "thinking corner". Likewise, it was observed that the applied punishments did not follow a common methodological pattern, reflecting the lack of basis in the field of the psychology of education of those who applied them. Finally, they feel that they need additional training in alternatives for the resolution of conflicts in the classroom. The educational implications of the results are discussed.

1. Sarrera

Diziplina falta, edo arauak eskoletan ez betetzea, munduko hezkuntza agintariak gehien arduratzen dituen gaietako bat da, eta pil-pilean dagoen gaia izanik, ikerketa eta baliabide ugari jasotzen ditu (Ortega, Del Rey eta Mora, 2001). Alabaina, historikoki, eta baita gaur egun arte ere, zigorra izan da eskoletan arau hausteei aurre egiteko erreminta nagusia (Márquez, Díaz eta Dávila, 2007) .

XIX. mendeko eskola tradizionalean, diziplina elkarbizitza arautzen zuen eredu multzo gisa definitu zen. Horrela, diziplina, eskolan, zigorrak ikasleari sortzen zion beldurraren bidez lortzen zen, zigor mota fisikoak izatera heltzeraino. (Valle-Barbosa, Vega-Lopez Flores-Villavicencio eta Muñoz De La Torre, 2014).

Halere, ezin dezakegu uler zigorra jada iraungitako fenomenotzat. Izan ere, oraindik estimulu ezberdinak (positiboak zein negatiboak) ezartzen ditugu ikasleen jokabideak aldatzeko (Morales, 2017). Egia da, bederen, urteek aurrera egin ahala eskolako zigorren joera aldatzen joan dela, sorrarazitako minari eutsi egin zaion arren (Moreno, 2013).

Gauzak horrela, lan honek bi helburu nagusi ditu: alde batetik, euskal eskoletan eta bereziki haur hezkuntza mailan zigorra erabiltzeari buruzko erradiografia egitea; Bestetik, Haur Hezkuntzako Graduko ikasleek erronka honi nola aurre egiten dioten aztertzea beraien etorkizun profesionalaren ikuspuntutik.

2. Metodologia

2.1. Lagina

Ikerketa hau egiteko, Haur Hezkuntzako 101 gradu ikaslerekin batera lan egin zen, ikasleei ikerkuntza honetako partaidekide (Students as partners) izateko proposatuaz. Ikasleei beren praktika aldian zehar behaketa bat egiteko proposamena egin zitzaien; helburu gisa, zigorraren erabilera behatzea, identifikatzea, klasifikatzea eta hari buruz hausnartzea izan zituzten. Behaketa bidezko ikerkuntza prozesu honen ostean, ikasgelako gatazkei aurre egiteko zituzten edota beren formazioan zehar jaso zituzten baliabideei buruz hausnartzeko ere eskatu zitzaien parte-hartzaileei; era honetan, ikerkuntzan oinarritutako ikaskuntza bultzatu zen (Research oriented learning). Guztira, 101 ikaslek hartu zuten parte. Horietatik, % 90,1 neskak ziren, eta % 9,9 mutilak. Batez beste, 23,15 (d.t. = 3,67) urte zeuzkaten, 19-24 urte zeuzkatelarik guztiek.

2.2. Instrumentua

Galde-sortan, lehenik, gaur egun haur-hezkuntzan zigorra aplikatzen den galdetzen zitzaien partaideei; gero, behatutako zigor motei buruz; ondoren, zigor horien ezaugarriei buruz eta, azkenik, zigorrei buruzko uste eta hauekiko aukerei buruz.

3. Emaitzak

Gure ikerketatik, hainbat datu esanguratsu atera genituen zigorrak gaur egun haur-hezkuntzan duen presentziari buruzko erradiografia zehatzagoa egiteko.

Lehenik eta behin, haur-hezkuntzako eskoletan, gaur egun, zigorra aplikatzen den galdetzean, ikasleen % 98k baietz erantzun zuen. Zigor konkretuei buruz galdetuta, % 70,3k pentsa-lekuaren erabilera behatu zutela baieztatu zuen; % 54,5ek, gustuko zerbait kentzea; % 26,7k, haurrak izkina batean zutik jartzea; % 21,8k, haurra gela barruan bakarrik uztea; % 8,9k, gustuko ez duen zerbait eman izana haurrari, eta % 42k beste mota bateko zigorren bat ere behatu du.

Zigor mota konkretuetatik haratago, zigorren nolakotasunari edo ezaugarriei buruz ere galdetu zitzaien. Hau da, ikasleek behatu zituzten zigor horietan zer-nolako ezaugarriak ikusi zituzten jakin nahi izan genuen (nahi beste ezaugarri aukeratu ahal ziren). Gehiengoak, % 61ek, irakasleak berehalako zigorra aplikatu zuela adierazi zuen; % 48,5ek, portaeran oinarritua, eta % 37k, haurrei gustatzen zaizkien gauzak kentzean oinarritua; % 35,6k, zuzendu nahi zen portaeraren neurrikoa, eta % 25ek, zigortu nahi zen jokaera horrekin zerikusia zuena. Bukatzeko, % 23 k zigorra haurraren izaeran oinarritutakoa izan zela baieztatu zuen, eta % 9,9k, ondo pentsatua.

Bukatzeko, zigorrari buruzko hainbat uste zein mailatan partekatzen zituzten galdetu genien ikasleei. Lehenik, “Zigorrak haurrarengan ez du berebiziko eraginik, neurrian apli-

katuz gero" esaldiarekin, % 21,8 ados edo oso ados agertu zen; % 44,6, ez ados ez ez-ados (zalantzan), eta % 33,7 ez-ados. Bigarrenik, "Etorkizuneko irakasle bezala, mementoren batean ikasleak zigortuko ditut, nik gustuko izan edo ez" esaldiarekin, % 34,7 ados agertu zen; % 25,7, ez ados ez ez-ados (zalantzan), eta % 39,6 ez-ados. Hirugarrenik, "Jokabide desegokiei aurre egiteko bestelako metodoak erabili nahiko nituzke, eta ez zigorra" esaldiarekin, % 90,1 ados agertu zen. Azkenik, "Jokabide desegokiei aurre egiteko bestelako metodoak erabiltzeko formazio nahikoa dudala uste dut" esaldiarekin, % 13,8 ados agertu zen; % 34,7 ez ados ez ez-ados (zalantzan), eta % 51,5 ez-ados.

4. Eztabaida

Ikerketa honen xedea gaur egungo euskal eskoletan eta bereziki haur hezkuntzan zigorra erabiltzeari buruzko erradiografia egitea izan da. Emaitzetan plazaratutako datuetatik hainbat ekarpen eta hausnarketa landu daitezke. Hasteko, irakasleek oraindik zigor tradizionala oso maiz erabiltzen dutela da lan honen ondorio nagusia. Haren xedeak haurren portaera desegokia desagerrarazi edo gutxitzea edota ikasleen arteko gatazkak konpontzea lirateke.

Egun erabiltzen diren zigorren artean, ezbairik gabe, "Pentsalekua" delakoa da zabalduena. Nahiz eta mundu mailan ikasle eta terapeuten artean teknika hau oso zabaldutakoa izan, haren baliagarritasuna edota —ordezko esku-hartzeekin konparatuz— apropostasuna aztertzen dituzten ikerketak oso urriak dira (Donaldson eta Vollmer, 2011). Izan ere, azken ikerketek diote prozedura hau polemiko bihurtu dela, gaizki ulertua izan delako, era ez-efektiboan erabili delako eta baita arrazoi etikoengatik ere (Wolf, McLaughlin eta Williams, 2006). Gainera, haur-hezkuntzako umeentzat bereziki kontraesankorra izan daiteke, ume hauek moralki estadio heteronomoan daudelako (Kamii, 1982) eta duten garapen mailan ezinezkoa delako haiek egindakoaren inguruan beren kabuz era sinboliko batean pentsatzea edo hausnartzea (Mendizabal, 2014).

Bestalde, zigorren ezaugarriei dagokienez, hezkuntzaren psikologia lantzen duten gidetan (Coll, Palacio eta Marchesi, 1990; Gonzalez-Pineda, Gonzalez, Nuñez eta Valle, 2002) baieztatzen da, nahikoa adostasunez, zigorra aplikatzea baino errefortzuak gomendagarriagoak direla, eta, aplikatuz gero, zigorra posiblea, berehalakoa eta portaeretan eta ez hezigaiaren izaeran oinarritua izan beharko litzatekeela. Halere, ikusi ahal izan dugu orokorki behintzat ezaugarri hauek gehienetan ez direla betetzen: kasuen erdietan, gutxi gorabehera, berehalakotasuna izan zen ezaugarri bakarra. Hemendik ondorioz dezakegu maila teorikoan zigorrak izan beharko lituzkeen ezaugarriak (konduktismoaren barnean balitz ere) ez direla egiaztatzen bere aplikazio praktikoan.

Honenbestez, XXI. mendeko hezitzaileen apusturik garrantzitsuenetako bat elkarbizitza era konstruktibista batean lantzea izan beharko litzateke. Hori dela eta, ikastetxe askok elkarbizitzarako heziketa egiten dute eta abian jartzen dute eskola-elkarbizitzarako plan bat, bere hezkuntza proiektuaren giltzarri gisa (Gorbeña eta Amundarain, 2010). Aurrerapauso honetan interesgarria litzateke eskola horietan bertan egiten den zigorraren erabilerari buruz hausnartzea.

Aitzitik, emaitzetan islatua agertu den bezala etorkizuneko irakasle askok ez dute beren burua prest ikusten aipatutako teknika ezberdin horiek aurrera eramateko. Beraz, betidanik erabili diren teknikez baliatzea, besteak beste zigorraz, beren aukera posible gisa ikusten dute. Hau horrela izan ez dadin, jokabide gatazkatsuak lantzeko teknikei indar handiagoa eman beharko litzaieke Haur Hezkuntzako Graduan.

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La realización de prácticas y su relación con la motivación del alumnado de Relaciones Internacionales

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Resumen

La realización de prácticas en los grados en Ciencias Sociales es un instrumento perfecto para aumentar la motivación de los estudiantes, utilizándolas para mostrar distintas formas en las que la teoría explicada puede aplicarse a la realidad a la que podrían hacer frente el estudiantado una vez incorporados al mundo laboral. La comunicación tiene dos objetivos: por un lado, indagar sobre el vínculo entre la realización de prácticas y su motivación y, por otro, indagar en la percepción del alumnado sobre la necesidad y utilidad de realizar prácticas, la valoración que le dan a prácticas realizadas en clase y las competencias que han alcanzado gracias a su realización.

Abstract

The use of practical classes in degrees of Social Sciences is a perfect instrument to increase students' motivation. Practical classes can be used to show different ways in which the explained theory can be applied to the reality students will face once they start their professional career. The communication has two main aims: on one side, to get deeper knowledge on the link between practical classes and students motivation and, on the other, look into the perception of students about the need and usefulness of practical classes, as well as the assessment they give to practices carried out in class and in which different degrees of involvement are required on their part.

1. Objetivos y metodología

El objetivo de la comunicación es analizar la motivación que ha despertado entre los y las estudiantes la realización de ejercicios prácticos en la asignatura Introducción a las Relaciones Internacionales. Siguiendo las investigaciones de Pekrum (2000, 2002), Isen (2008) o Mora (2013), entre otros, el aprendizaje se produce principalmente a través de las emociones. Como destaca Mora, *solo puede ser verdaderamente aprendido aquello que te dice algo, aquello que llama la atención y genera emoción, aquello que es diferente y sobresale de la monotonía* (2013), por eso, las clases prácticas dinámicas y que establecen un nexo con el mundo laboral al que se incorporará el alumnado pueden ser especialmente útiles para el proceso de aprendizaje.

La comunicación recoge los resultados de las encuestas realizadas al alumnado de la asignatura Introducción a las Relaciones Internacionales que se imparte en el primer curso del grado de Gestión y Administración Pública y en el de Ciencias Políticas de la Facultad de CC. Políticas y Sociología de la UCM. El alumnado fue preguntado no solo por la motivación que despertó en ellos cada una de las cinco prácticas realizadas, sino también las competencias que más han desarrollado gracias a las mismas. Un total de 22 estudiantes respondieron a las encuestas, realizadas durante el curso 2018/2019.

2.. Resultados

Preguntados sobre el grado de importancia que le dan a la realización de prácticas en clase y sobre cómo creen que estas refuerzan lo aprendido en las clases teóricas, los estudiantes consideran muy necesario (8.7) la realización de prácticas a lo largo del grado y claramente vinculan las clases prácticas con el aprendizaje de la teoría (también un 8.6).

Todas las prácticas realizadas en la asignatura Introducción a las RRII son diferentes y tratan de alcanzar distintas competencias entre el alumnado, quienes valoran con un 7.8 su utilidad global.

La primera práctica realizada consiste en la comparación entre Estados con el objetivo de adquirir competencias de búsqueda de información y comparar a los Estados en términos económicos, educativos, sanitarios, etc. Entre los aprendizajes que el alumnado señala en la encuesta se encuentra un mayor conocimiento de los Estados comparados, aprender a buscar y analizar información, aprender a tomar decisiones basadas en la comparación de datos estadísticos, aprender sobre el concepto de "Estado fallido" o mejorar la comunicación escrita. La motivación que les ha despertado esta práctica ha sido valorada con un 7.4.

La práctica dos consiste en leer un artículo académico sobre los problemas a los que se enfrentan las Naciones Unidas y hacer una exposición del mismo en clase. El alumnado destaca que la práctica les ha ayudado a entender mejor el funcionamiento de la ONU, mejorar el análisis de textos, la comunicación oral y la capacidad de síntesis. La motivación de la práctica ha sido valorada con un 6.4.

En la práctica tres los estudiantes tienen que asumir el rol de una agencia de la ONU y defender en clase el papel de la agencia en la guerra de Yemen. El objetivo de esta práctica es que conozcan distintas agencias de la ONU, profundizar sobre lo que hacen en el terreno y aprender sobre la guerra entre potencias regionales que está ocurriendo en el país. Entre el aprendizaje ganado destacan los tres objetivos que se tenían: aprender sobre el trabajo de las agencias de la ONU en el terreno y aprender sobre un conflicto poco tratado en los medios de comunicación. Además, destacan la mejora en la comunicación escrita y oral. La valoración que han dado a esta práctica ha sido de un 7.75.

La práctica cuatro consiste en el visionado de una charla y una entrevista a reconocidos teóricos de las Relaciones Internacionales (RRII), su posterior discusión así como la realización de un ejercicio en el que, por grupos, los estudiantes tienen que responder de forma razonada a unas preguntas sobre unos artículos relacionados con las teorías de las RRII que han tenido que leer previamente. El alumnado destaca que esta práctica les ha aportado más información y les ha ayudado a tener un mejor entendimiento sobre las teorías de las RRII. La motivación ha sido valorada con un 6.3.

La última práctica realizada consiste en la celebración de un debate de la Asamblea General en la que tienen que representar a un país y, dependiendo del grupo, debatir sobre el papel de la mujer en política o cómo fomentar un consumo responsable a nivel internacional. Los alumnos destacan entre los conocimientos adquiridos una mayor profundización sobre el funcionamiento de la Asamblea General, pero sobre todo, la mejora de la capacidad de expresarse en público, negociar y debatir entre compañeros. La valoración media de esta práctica es de un 8.7.

2.1. ¿Pero qué les motiva exactamente?

En todos los ejercicios prácticos realizados el alumnado ha sido evaluado, bien por su intervención en clase en los debates preparados o a través de la valoración del ejercicio escrito que han tenido que entregar. Preguntados sobre qué es lo que más les motiva de las clases prácticas, la mayoría ha mencionado que estas clases refuerzan lo aprendido en las clases teóricas, les ayuda a entender mejor la asignatura, aprenden más que con las teóricas y les ayuda a conocer el funcionamiento de organizaciones internacionales y no gubernamentales (ONG) o la situación por la que atraviesan determinados países.

El segundo grupo de respuestas más numerosas hace referencia a la mejora de su comunicación oral y escrita, así como la habilidad de negociar entre ellos para alcanzar acuerdos en las simulaciones realizadas.

3.. Conclusiones

A pesar de la escasa muestra analizada, queda clara la elevada motivación con que los estudiantes realizan las prácticas (todas ellas en grupo) y cómo este tipo de clases consigue mejorar el entendimiento de la parte teórica.

Es interesante ver que las prácticas que han obtenido una menor puntuación en las encuestas son aquellas en las que el estudiante tiene un papel pasivo o más tradicional, como la exposición de una lectura o la discusión sobre la charla de un teórico relevante de las RRII visionada en clase. Las que mejor puntuación reciben, sin duda, son aquellas en las que el alumnado se ha tenido que implicar más, adoptando el rol de un Estado ante una organización internacional o simulando ser el representante de una agencia internacional en un conflicto.

Algo relevante en todas las prácticas, sin embargo, es la utilidad para mejorar la capacidad escrita y la exposición oral que destacan los estudiantes, algo que en ningún momento se ha tenido como objetivo cuando se han ideado las mismas, pero en lo que hay que seguir profundizando debido al alto número de estudiantes que lo destacan. De hecho, uno de los objetivos con los que se han estructurado las prácticas había sido situar al alumno en situaciones reales a las que pueden enfrentarse en un futuro laboral con el objetivo de aumentar su motivación. No obstante, la mención del futuro laboral como elemento motivador ha sido minoritario en las respuestas recogidas.

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Gaztenpatia: programa intercultural que promueve la empatía y la solidaridad entre la juventud vasca y la juventud latinoamericana en proyectos de cooperación

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Resumen

Gaztenpatia es un programa intercultural que promueve la empatía y la solidaridad entre el alumnado de la Universidad del País Vasco (UPV/EHU) y la juventud de otros países en los que Euskal Fondoa (la Asociación de Entidades Locales Vascas Cooperantes) tiene en marcha proyectos de desarrollo en Centroamérica (Guatemala, Nicaragua y El Salvador)

Este programa está dirigido al alumnado interesado en realizar sus Prácticas y/o Trabajos Fin de Grado (TFG) y forma parte del Programa de Prácticas y TFG en cooperación al desarrollo que la UPV/EHU realiza desde 2003, respondiendo a su misión de formar personas conscientes de las desigualdades que existen en el mundo así como al compromiso de la UPV/EHU con los Objetivos de Desarrollo Sostenibles (ODS) que conforman la Agenda 2030.

El programa se puso en marcha en 2016 y en él han participado 69 estudiantes (46 mujeres y 23 hombres) que han valorado muy positivamente la experiencia.

Abstract

Gaztenpatia is an intercultural program that promotes empathy and solidarity between the students of the University of the Basque Country (UPV / EHU) and the youth of other countries in which Euskal Fondoa (the Association of Basque Cooperating Local Entities) has ongoing projects of development in Central America (Guatemala, Nicaragua and El Salvador)

This program is aimed at students interested in completing their Internships and/or Final Degree Projects (FDP) and is part of the Practices and FDP Program in development cooperation that the UPV/EHU has been carrying out since 2003. This program responds to the mission of the University to train people aware of the inequalities that exist in the world as well as the commitment of the UPV/EHU to the Sustainable Development Goals (SDGs) of the 2030 Agenda.

The program was launched in 2016 and 69 students (46 women and 23 men) took part in the program, which have valued the experience very positively.

1. Presentación, objetivos y principios

Gaztenpatia es un proyecto intercultural que promueve la empatía y la solidaridad entre la juventud vasca y la juventud de otros países con los que se hace cooperación y solidaridad. El proyecto es impulsado por la UPV/EHU y Euskal Fondoa, que es la Asociación de Entidades Locales Vascas Cooperantes, y está dirigido al alumnado universitario interesado en realizar sus Prácticas y Trabajos Fin de Grado (TFG) en colaboración con proyectos de desarrollo ejecutados por las organizaciones socias de Euskal Fondoa en Centroamérica, Cuba y los Campamentos Saharauis.

Gaztenpatia forma parte del Programa de Prácticas y Trabajos Fin de Grado en cooperación al desarrollo que la UPV/EHU realiza desde 2003, respondiendo a su misión de formar profesionales conscientes de las desigualdades que existen en el mundo. La puesta en mar-

cha del proyecto en 2016 responde también al compromiso de la Universidad con los Objetivos de Desarrollo Sostenibles (ODS) de la Agenda 2030 de Naciones Unidas

1.1. Objetivos

El objetivo principal del programa Gaztenpatia es contribuir al desarrollo de relaciones de empatía y solidaridad entre jóvenes, a través del involucramiento del alumnado de la UPV/EHU en acciones conjuntas con jóvenes que participan, directa o indirectamente, en los proyectos de desarrollo apoyados por Euskal Fondoa.

Los objetivos específicos del programa son:

- Facilitar al alumnado de la UPV/EHU las condiciones para que pueda realizar sus prácticas, curriculares y voluntarias, y sus TFG en proyectos de desarrollo apoyados por Euskal Fondoa.
- Sensibilizar y formar al alumnado universitario en valores de solidaridad y cooperación internacionalista, poniéndole en contacto con la realidad que vive la juventud en países que tienen mayores dificultades y carencia de recursos que el nuestro.
- Involucrar al personal docente de la UPV/EHU en labores de tutorización y acompañamiento al alumnado que decida realizar sus prácticas y TFG en proyectos de cooperación al desarrollo.
- Promover la visibilización de los proyectos que realizan las y los estudiantes, a través de actividades comunicativas desarrolladas por el alumnado durante y después de su estancia en los países de destino.
- Formalizar y dar continuidad a la colaboración de Euskal Fondoa con la UPV/EHU, de cara a la realización tanto de las prácticas y TFG del alumnado como de actividades de sensibilización y formación con la comunidad universitaria.

1.2. Principios

Gaztenpatia comparte los principios que fundamentan el Programa de Prácticas y TFG de la UPV/EHU y añade otros cuatro más:

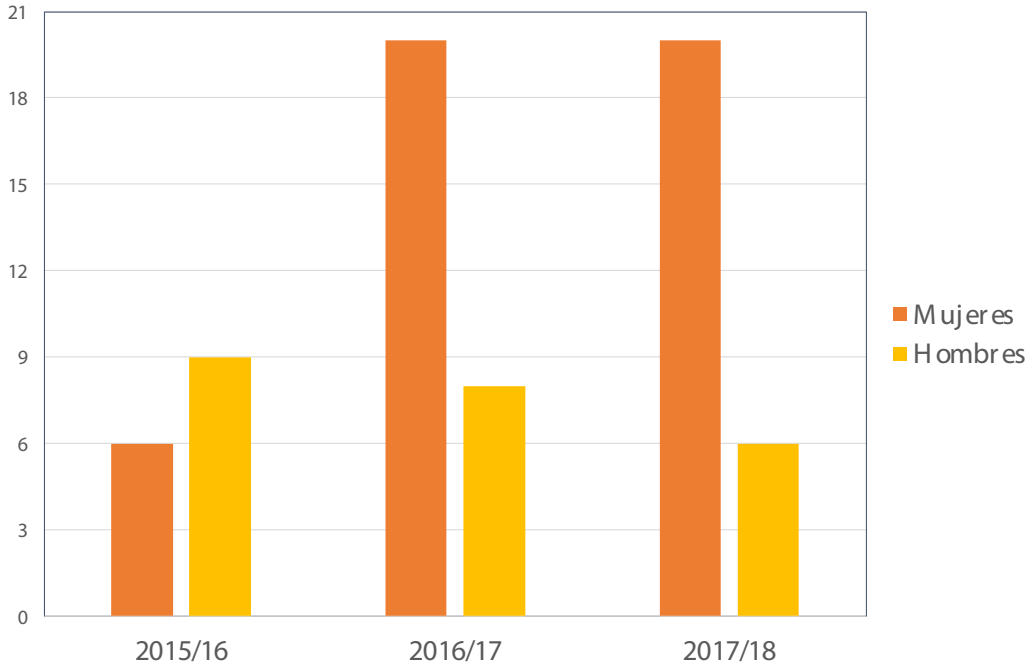
1. Formación: el alumnado mejora su preparación académica y profesional participando en experiencias que le proporcionan nuevos aprendizajes y posibilidades de desarrollar nuevas habilidades.
2. Empatía: la capacidad cognitiva de percibir lo que otra persona puede sentir, el sentimiento de participación afectiva en la realidad que afecta a otra persona, requieren del alumnado una fuerte motivación para colaborar con sociedades que sufren mayores dificultades y carencia de recursos que la nuestra.
3. Juventud: el alumnado se involucra en acciones conjuntas con jóvenes que participan, directa o indirectamente, en los proyectos de las organizaciones y entidades de los países de destino.
4. Comunicación: la visibilización de las actividades que se desarrollan en el marco de Gaztenpatia es parte fundamental de este proyecto. Para ello, se ha habilitado un espacio en las web de la UPV/EHU (https://www.ehu.eus/es/web/oficop/gaztenpatia) y de Euskal Fondoa en los que se comunica de manera sistemática tanto el trabajo del alumnado en relación con sus prácticas o TFG, como el día a día de lo que ocurre en sus proyectos y en las organizaciones que los acogen.

2. Resultados y conclusiones

Desde la puesta en marcha del programa en el año 2016 han participado 69 estudiantes (46 mujeres y 23 hombres). El número de participantes de la 2.ª y 3.ª edición (28 y 26, respectivamente) ha duplicado el número de participantes de la 1.ª edición (15 estudiantes). En las dos últimas ediciones ha destacado la presencia de mujeres en el programa, que han duplicado en la 2.ª edición y triplicado en la 3.ª edición el número de hombres. En la Figura 1 se muestra esta evolución y la desagregación por sexos.

Figura 1

Evolución del número de estudiantes que han participado en las tres ediciones de Gaztenpatia, desagregados por sexo



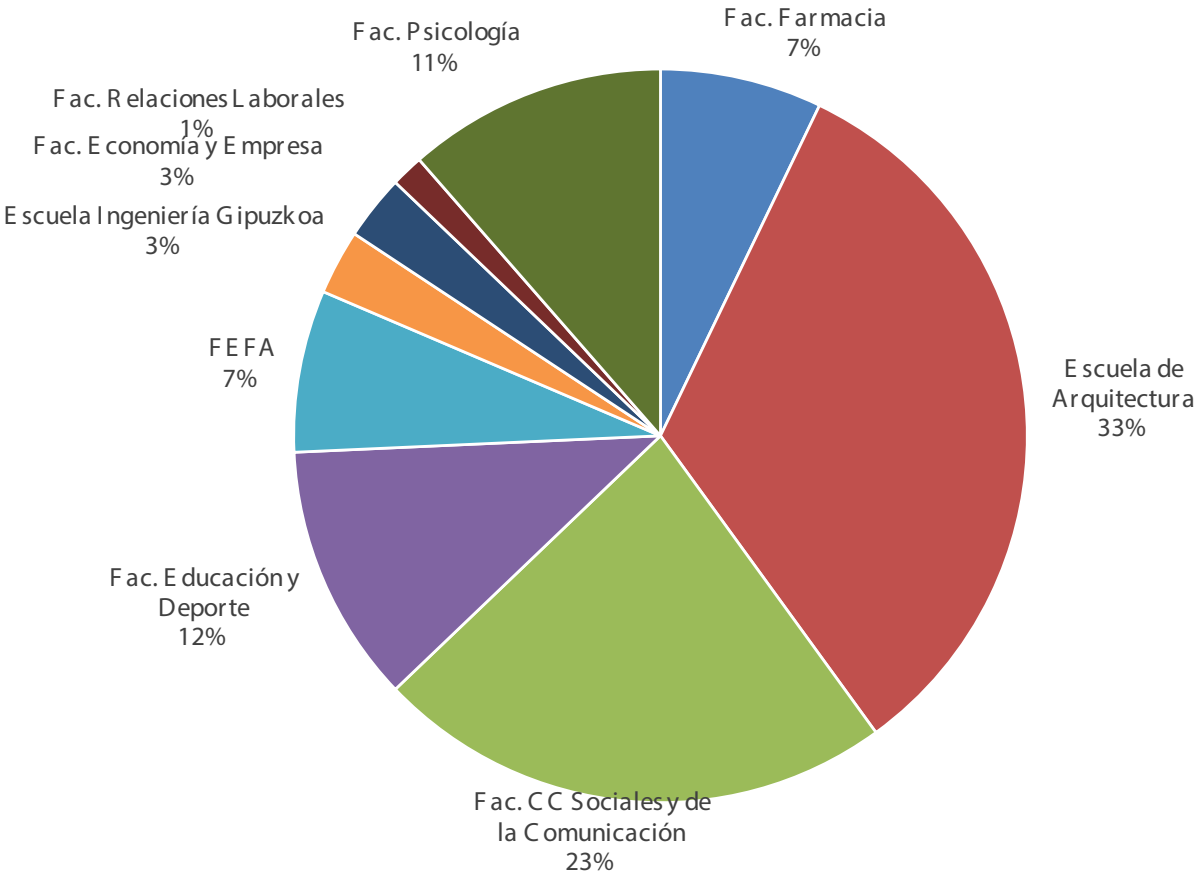
Los proyectos a los que se han incorporado las personas participantes en Gaztenpatia han sido en los países y con las organizaciones locales que se muestran en la Tabla 1. Los proyectos del programa son planificados junto con Euskal Fondoa y las organizaciones locales para dar resolución de problemas reales de las comunidades destino. Para ello se organizan anualmente encuentros entre las contrapartes. Para más información sobre los proyectos y encuentros consultar: https://www.ehu.eus/es/web/oficop/gaztenpatia.

Tabla 1
Proyectos Gaztenpatia

Proyecto Gaztenpatia-País	Organización
Gaztenpatia Guatemala	Fundación Iniciativa Civil para la Democracia (INCIDE)
Gaztenpatia Suchitoto-El Salvador	Colectiva Feminista para el Desarrollo Local (CFDL)
Gaztenpatia Morazán-El Salvador	Comunidad Segundo Montes
Gaztenpatia-Nicaragua	Asociación para el Fomento del desarrollo local ecosostenible del Río San Juan (ASODELCO)
Gaztenpatia-Ibagué-Colombia	Fundación Yapawayra -Vientos de cambio

El alumnado participante procede de 9 centros (Escuelas y Facultades) de la UPV/EHU. La distribución porcentual se muestra en la Figura 2. Un tercio del alumnado participante estudia en la Escuela Técnica Superior de Arquitectura. También destaca la presencia de alumnado de la Facultad de Ciencias Sociales y de la Comunicación, Facultad de Educación y Deporte, Facultad de Farmacia y Facultad de Psicología.

Figura 2
Distribución del alumnado participante en las tres ediciones e Gaztenpatia por centros



Una vez finalizada la 3.ª edición de Gaztenpatia disponemos de indicadores que certifican sus resultados positivos tanto en términos académicos como de sensibilización y fomento de las actitudes solidarias del alumnado y profesorado participante.

Según los testimonios del alumnado el programa, Gaztenpatia 1) les han proporcionado vivencias que cambian actitudes, 2) ha fomentado el desarrollo de la autonomía y la responsabilidad y 3) les ha dado a conocer nuevas formas de participación para luchar contra las desigualdades.

Por todo lo expuesto, se constata que el Programa Gaztenpatia es una excelente herramienta para la promoción de la práctica de la sostenibilidad en el entorno universitario.

Agradecimientos

Desde la Oficina de Cooperación al Desarrollo de la UPV/EHU queremos expresar nuestro más sincero agradecimiento a todos las y los estudiantes participantes en Gaztenpatia y docentes-tutores de los proyectos, así como al personal de Euskal Fondoa y de las organizaciones locales que nos han dedicado con gran generosidad parte de su tiempo a la puesta en marcha y desarrollo del programa presentado en esta contribución. Sin ellas y ellos no hubiera sido posible llevarlas a cabo.

Autonomous Laboratory Practices in the Course of Human Histology in the Degree of Dentistry

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Abstract

The autonomous laboratory practices method is carried out in the following way. Prior to the delivery of the practices, the histological preparations to be worked are deposited in a digital repository scanned in a format that allows their visualization using free access virtual microscopy platforms. Before the face-to-face practice session, the responsible professor facilitates the students virtual preparations of the samples corresponding to said session. Working on their own computer, each student, with the help of bibliographical material searches the sample for the objectives that will be worked on in the face-to-face session, captures the corresponding images, copies in the practices file and points out the objectives at hand. In the face-to-face session, using the real microscope, the students look for the objectives of the practice using the material previously worked as support. Once each objective is located, they make a representative drawing on the practice sheet. At the same time, during this face-to-face class, the teacher monitors the work of each student validating the searches carried out. At the end of the class, each student submits the internship form where both face-to-face and non-face-to-face work appear and, after being evaluated by the teacher, it is returned with the corresponding feedback.

We have a positive perception of the opinion of the students about this new modality that has been corroborated in the specific opinion polls that have been made. To highlight some results, the students have rated the item "Observing the preparations with the virtual microscope has made it easier for me to study them in the laboratory" with a 4.5 out of 5 or, with a 4.6 out of 5 the item "work from this way the laboratory practices has helped me to understand better the concepts worked in the teaching modalities ".

1. Introduction

All the university degrees focused on biomedicine impart subjects dedicated to the professional formation in the knowledge of the organization and functioning of the human body. Just as Anatomy describes structures visible to the naked eye, Histology delves into the microscopic structure of the human body formed by tissues in non-pathological situations.

The dentist has to know the composition of the tissues on which he will work to proceed in an effective and safe way, safeguarding as far as possible the health and integrity of the patient.

Therefore, the study of histology is accompanied by a mandatory instrument; the microscope. The microscopic structures that are worked in the study of histology such as cells and tissues are indistinguishable to the human eye and it is necessary to amplify the images. It is an eminently visual discipline. The student can always access histology books based on microphotographs to build virtual images of the compositions of the organs in his mind, but true learning and mastery are done by working on the ground. The management of the microscope working on human and animal samples gives the student competence in the proper management of the optical microscope for the study of tissues [1]. For this reason,

most of the subjects related to histology in the biomedical sciences have practical teaching methods in which students individually manipulate optical microscopes in the search of histological objectives. Traditionally, the practical sessions dedicated to the use of the optical microscope for the study of human tissues in the different subjects related to a greater or lesser extent with histology were carried out in a very directed manner in which the student followed the instructions of the teacher. In almost all cases, the students adopted a passive situation and the teacher explained the objectives to be sought during the practical session. The fact of not being able to provide previous situations in which the students worked on the future objectives resided in the impossibility of the students to be able to access a microscope outside the physical class of practices. This situation has been solved in part with the emergence of the virtual microscope. Virtual microscopy is based on computer programs that simulate optical microscopes. Nowadays there are free programs that can be downloaded and they allow visualizing scanned histological samples as if we were working on an optical microscope.

2. Methods

The procedure of the practices is described in a chronological manner:

1. The teacher provided the students with the link to download each one on their computers the programs of the viewers that simulate the digital microscopes.
2. The teacher also provided the students with the link to the repository where the scanned images are stored as well as the practice sheets. The practice sheets are structured in the following manner. On the left there is a space to fill the scanned images captured from the viewers. On the right there is space to fill in the face-to-face session.
3. Once the students have the virtual microscopy viewer installed, and the scanned samples downloaded to the computer along with the practice file, the autonomous and non-contact work begins. Following the instructions on the card look for the indicated objectives. For this, it can be supported in the bibliography provided by the teaching team that is based on Histology Books-Atlas, textbooks, web pages as well as notes on the classes of other teaching modalities. The students look for the objectives and take a still picture when they find it on the screen using the method known as „screenshot". The still picture is embedded in the left part. After printing, the objectives are indicated by hand using lines and arrows that more specifically determine each objective.
4. Once in class, the students are placed individually in a microscope position and acquire the collection of histological samples stored in individual boxes (a collection for each student). The sample is placed and taking as a guide the non-face-to-face part, the objectives are looked for in the microscope. Once found, the presence of the teacher is requested to certify the correction of the field located according to the objective sought. If the search is correct, the teacher certifies it by signing the part corresponding to the classroom work and the student proceeds to draw what he observes under the microscope indicating the objectives. In case the search is not correct the teacher will guide the student in the search through the interaction between both based on the reasons that caused the error.
5. At the end of the face-to-face class, the cards will be handed in so that they can be corrected by the teaching staff and delivered with the pertinent comments as well as the evaluation.

3. Results and Discussion

The subject Histology in the degree of Dentistry pivots on two learning outcomes:

1. Know in detail the microscopic structure and organization of the basic tissues of the human body and its organization in the tooth and the oral cavity.
2. Recognize the different human tissues, their characteristic structures and their disposition in the oral cavity and the tooth under the microscope or in microscopic images.

The different activities that are included in the proposed modalities try to influence these two results. The activity that we present is included in the learning outcome 2 but it is not the only activity. In addition to the proposed practice with a face-to-face and face-to-face part for the achievement of learning outcome 2 and its evaluation there is an activity in which the student individually explains three histological samples using a microscope that has a monitor attached. It consists of three exercises distributed throughout the course on a regular basis. The evaluation of this activity together with the evaluation of the cards make up the evaluation of the practical part that consists of 70% of the final grade and a numerical value of 6 is required to approve this part. Obviously, the skill to perform the three identification exercises on the monitor are acquired by making the cards and working on them. The first important result that can be concluded is the high rate of passing of the practical part of the subject. During the 2017/2018 academic year there was 100% passing with 37% outstanding. Second, comment on the results obtained from surveys made to the students anonymously about the perception of the activity. This survey was carried out at the conclusion of the course with a series of items that had to be valued between 0 and 5, with 0 not agreeing and 5 strongly agreeing. The students have rated the item "Observing the preparations with the virtual microscope has made it easier for me to study them in the laboratory" with a 4.5 out of 5 or, with a 4.6 out of 5 the item "work from this way the laboratory practices has helped me to understand better the concepts worked in the teaching modalities ".

Acknowledgments

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Focus on reflective practice: innovation project across subjects in Foreign Language Teacher Initial Training (Primary and Preprimary Degrees)

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Abstract

This poster presentation will describe the interdisciplinary innovation project that is being carried out since 2014 in Foreign Language initial teacher training at the Faculty of Education, Philosophy and Anthropology, University of the Basque Country.

The project is set in the context of the new competence based framework issued from the Bologna Process. It aims at developing a new training model focused on reflective practice, where the creation and implementation of teaching activities and their analysis and evaluation take the central place in the specialist teachers' initial training. At the same time, it seeks to reinforce links between University and School, so as to create a network for innovative practices in Foreign Language teaching in the light of the type of activities and subsequent reflection carried out by our students in the experienced teachers' classrooms.

The whole process is documented through video recordings and written evidence of students' activities and reflections that will feed in in a line of research around key elements of training in language didactics.

1. Context

The project is based on the initiative of three members of the teaching staff of the foreign language section of the Department of Language and Literature Didactics of the UPV/EHU, who have the common aim of enhancing active methodologies focused on real life experiences in Higher Education. The innovative experience is framed within a context of transformation of the university educational model into a competence-based model where the contents of the subjects are being reviewed and redefined in order to optimise the attainment of the competences of the new degrees.

In the case of novice teacher training, this means to move away from a prescriptive model, to a model that focuses on production and reflection on one's own activity. In this sense, this project aims to promote a new model of initial teacher training based on reflective practice which takes as its central focus the teaching activity itself and its analysis, as proposed by the theoretical framework of cognitive ergonomics and work activity (Durand, 2008; Schütz, 1932).

Likewise, the aim is to create networks that produce synergies. The networks we are trying to weave extend both inwards and outwards. Inwards, with a cross-curricular and multidisciplinary view of Higher Education. Outwards, searching to reinforce the links between the University and the School, making the most of students' internships in the schools (Practicum), and articulating the research work for the end of the degree in a continuum.

The new model was put into practice for the first time in the 2014-2015 academic year in the 4th year of the Grade studies in Infant and Primary Education, of the Foreign Language Minor, in the Faculty of Education, Philosophy and Anthropology.

2. Objectives

To this end, the project has objectives at two levels: at the institutional level and at the level of student training.

2.1. Institutional objectives

1.1. To investigate and develop the formative model of analysis of one's own activity (Iriondo, I., Plazaola, I; Zulaika, T. (2018), by putting it into practice in the training of new teachers.

1.2. To create synergies within a common theoretical framework, bringing together three subjects of the Minor in Foreign Language, Practicum III and End of Degree Dissertation. In this way, the attainment of the novice teacher's exit profile is jointly promoted in order to achieve the competences that the students have to demonstrate in their actions, that is, in the analysis / reflection and production of language learning situations.

1.3. To promote the creation of a stable university-school network, considering that a close collaboration between the University and the School is essential in the process of training new teachers. Furthermore, the aim is to create a learning network in which not only the students learn, but all those who are involved in the network, including the teaching staff.

2.2. Training objectives

2.1. To create an integrated framework for competence-based education in University, where resources worked on in the different subjects are integrated into the design, implementation, analysis and evaluation of didactic activities. The real teaching activity is, therefore, the central axis for the development of the competences of the new teacher.

2.2. To promote the change of methodological paradigm in language teaching towards the action-oriented perspective promoted by the Common European Framework of Reference for Languages (Council of Europe, 2011). The premise underlying the proposal is that languages are learnt as they are used as a tool to negotiate and solve situations in different social contexts. In the case of the school context, the key to the development of linguistic competence is the effective use of language in teaching and learning tasks, in such a way that the communicative context of the classroom offers the maximum number of opportunities to use and build the language. Consequently, training should prioritize the methodological and didactic aspects related to the collective construction of knowledge and language.

2.3. To create foundations for a culture of open classrooms and permanent training in new teachers. A generalized characteristic of our school model is to consider the classroom as the private fiefdom of each teacher in which it is difficult for other professionals to enter. We need to open the doors of the classroom and promote processes of observation of

daily practice, of exchange and collective elaboration of didactic models. The inclusion of these dynamics in initial training seeks to create a teacher model committed to developing continuous and collective learning.

3. Methodology

The axis of the formative process is the reflexive application, the collective contrast and the later introduction of improvements in the didactic proposals designed by the students, following the phases stated below:

- Development of complementary teaching-learning modules in three subjects dedicated to language didactics, with the aim of integrating knowledge in the design of didactic activities on the part of the students.
- Design of teaching activities by the students in groups of 3-4 and their implementation in"micro-teaching" sessions in front of their classmates. In the subsequent reflection session, the group presents its own analysis of the activity and receives feedback from the rest of the class and from the teachers.
- Review and improvement of the activities (during and after the practicum in the schools). During the school placement period, students discover pupils' real abilities and possibilities and they compare their expectations with reality. They put their activity into practice in one of their placement schools followed by a process of autonomous reflection and improvement actions.
- Sessions with Infant and Primary students (around two hundred boys and girls from six schools in Gipuzkoa this year). Each team of students carries out its activity with a group of students being observed by the rest of the class, the schoolteachers and the university faculty involved in the project. Afterwards, there is a collective reflection on the activity with the participation of all those present. (In writing in the case of the teachers —and students— of the schools).
- Design of a didactic sequence in which the activity is integrated into its final improved format. Teachers give complementary input on new contents as they appear coherent sequencing of activities leading to a task, balance of skills, curriculum design, evaluation, etc.
- End of Degree Dissertation. Students identify aspects of interest arising from reflective practice and develop their theoretical research and subsequent application in their End of Degree Dissertation.

4. Conclusions

The ultimate goal of this project is to improve the initial training of the teaching profession. In order to do so, it is essential to know the activity of novices in view of the provisions that the actors themselves explain: the representation they make of their work, the factors to which they lend attention in the description of their activity, the reasons and motives they consider, the evaluations they make of it, etc. This is the starting point of the line of research that the project is developing based on the analysis of written and videotaped evidences of students' actions and subsequent reflections.

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Secondary school students' alternative conceptions in taxonomy and diversity of invertebrates: a case study on the effect of active teaching-learning methodologies

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Abstract

The identification of alternative conceptions constitutes a useful tool to allow students to provide a good starting point to their own teaching-learning process. Concerning the topic of invertebrates, in secondary school students usually emerge alternative conceptions related to taxonomy, as well as negative perceptions about these animals and feelings of useless. Moreover, they tend to underrepresent their diversity, minimizing their environmental implications. In this regard, we aimed to identify common alternative conceptions in 12/13 year old secondary school students and analyze if after a formative intervention based on active teaching-learning methodologies such conceptions can be modified. To this effect, 60 first grade secondary school students completed a questionnaire before and after the intervention that included frequently recurrent alternative conceptions, by means of open questions, a test, true/false statements, and a table for classifying animals, as well as a drawing. Before the intervention, students used to conceive the term animal referred only to vertebrates, and mostly represented by mammals; perceived invertebrates as useless and harmful to humans, and were not aware of the vast diversity of invertebrates. After the intervention, invertebrates were regarded as more abundant, relevant and stimulating, and thus students were more interested in acquiring knowledge about them. However, we also identified a persistence in alternative conceptions related to classification, which points to a further need to reinforce that subject. On the other hand, the fact of not only learning conceptual contents, but also learning some aspects such as invertebrate diversity and its relevance, has profound attitudinal implications on their future role in preserving the environment.

1. Introduction

From pre-school to university stages, and even among teachers, one of the most persistent areas addressing alternative conceptions in biology is related to animal classification or taxonomy (Allen, 2015; Bell, 1981; Braund, 1991; Burgoon & Duran, 2012; Kattmann, 2001; Melero-Alcíbar & Gamarra, 2016; Prokop, Fancovicova, & Tunnicliffe, 2009; Prokop, Prokop, & Tunnicliffe, 2008; Reiss & Tunnicliffe, 2001; Trowbridge & Mintzes, 1988; Yen, Yao, & Chiu, 2004; Yen, Yao, & Mintzes, 2007). The implications of misclassifying animals imply not only a lack of a strong base in which new knowledge is built (Patrick & Tunnicliffe, 2011), but also these concepts are transferred to other areas of biology, such as evolution, genetics, and ecology (Allen, 2015; Lin & Hu, 2003; Yen *et al.,* 2007). Throughout all educational stages, students usually classify animals according to their external features. However, as students grow up, more abstract criteria are incorporated, such as habitat or ways of locomotion (Allen, 2015; Kattmann, 2001; Yen *et al.,* 2007).

In addition, when students are asked about concepts such as *living being* or *animal*, responses are frequently referred to vertebrates (Kellert, 1993); even though vertebrates constitute a minor portion taking into account the whole diversity of animals. For instance, arthropods (and especially insects) are known to be the taxon possessing the highest specific diversity, have been able to colonize all of the terrestrial ecosystems, and have a key role on ecosystem services (Samways, 2005). Despite their diversity and relevance, media over represent vertebrates in detrital of invertebrates (Snaddon & Turner, 2007; Snaddon, Turner, & Foster, 2008). In fact, social perception about small invertebrates includes feelings of rejection and fear (Barrow, 2002; Drissner, Haase, & Hille, 2010; Drissner, Haase, Wittig, & Hille, 2014; Drissner, Simonte, & Hille, 2016; Kellert, 1993), especially concerning insects (Kellert, 1993). In this context, Weilbacher (1993) and Heywood (1995) warned about the risks for society if students are not aware or biodiversity, since it is unlikely that, when these students grow up, they will observe the need for environment preservation if they do not respect them.

In this regard, we aimed to identify common alternative conceptions in 12/13 year old secondary school students and analyze if after a formative intervention based on active teaching-learning methodologies such conceptions can be modified.

2. Methods and Research Design

2.1. Research context and design

In this work, 60 first grade secondary students (12/13 years old) from the same high school filled a questionnaire before and after a formative intervention. The questionnaire was based in different strategies of data collection, since a single method would throw incomplete information (Cinici, 2013). Hence, 9 questions were asked, that included: a drawing of a forest in order to estimate their awareness of diversity, following Drissner *et al.* (2014); open questions concerning *living being* concept and classification, according to Cinici (2013), Kattmann (2001), Shepardson (2002), Tunnicliffe & Reiss (1999) and Yen *et al.* (2007); identification and classification of invertebrates (Allen, 2015), a description of some invertebrates Drissner *et al.* (2014) and Kellert (1993); and a test, as well as a True/False statements question.

2.2. Data analysis

Each question was analysed following the above listed authors, where qualitative outcomes (i.e. drawing, True/False statements, adjectives) were transformed into numeric data, by quantification of number of animals drawn, number of right answers, or assigning either a positive or negative number according to the adjectives used to describe invertebrates. Subsequently, questionnaires were processed and analysed by means of R package (R Core Team, 2016). Data were checked for normality (Shapiro-Wilk) and homoscedasticity (Levene) prior to testing. Afterwards, according to type of data and normality tests, inference tests included Mann-Whitney-Wilcoxon tests, paired samples Wilcoxon tests, and Pearson's χ^2.

3. Outcomes and Discussion

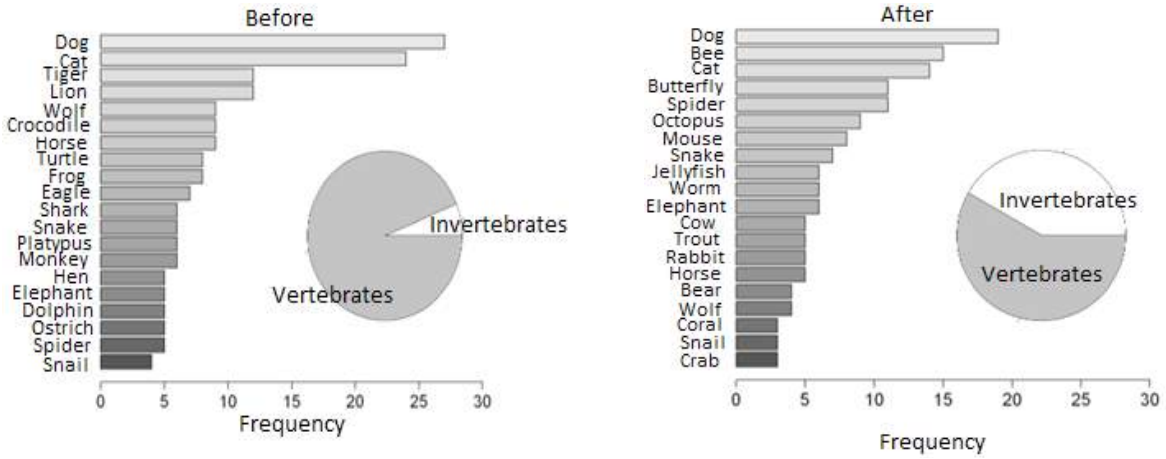
3.1. Diversity and awareness of invertebrates

After the intervention, students showed a deeper understanding about diversity of animals, especially in the case of invertebrates. While mean number of species represented by the drawing increased 20% regarding before the intervention, percentage of invertebrates over all the diversity increased by 10 times. However, mean presence of vertebrates still approached 50%, suggesting the higher awareness of vertebrates respect to invertebrates (Drissner *et al.*, 2014). Furthermore, prior to the intervention, 12% of students included anthropic environments, which could support the idea that nature is at our service (Drissner *et al.*, 2010).

Also, when asked to name 5 animals (Figure 1), the same trend was repeated, where vertebrate animals were the most represented before the intervention, especially mammals and birds. Similar studies in United Kingdom, Taiwan and United States threw the same results (Allen, 2015; Bell, 1981; Trowbridge y Mintzes, 1988; Yen *et al.*, 2007). Underrepresentation of invertebrates, especially before the intervention, seems to be a common cultural fact, since the same outcomes have been found among countries and even continents (Davey et al., 1998; Drissner et al., 2014, 2016; Patrick et al., 2013).

Figure 1

Most cited animals before (up) and after (down) the formative intervention.
Pie charts represent the proportion of vertebrates and invertebrates in each bar plot



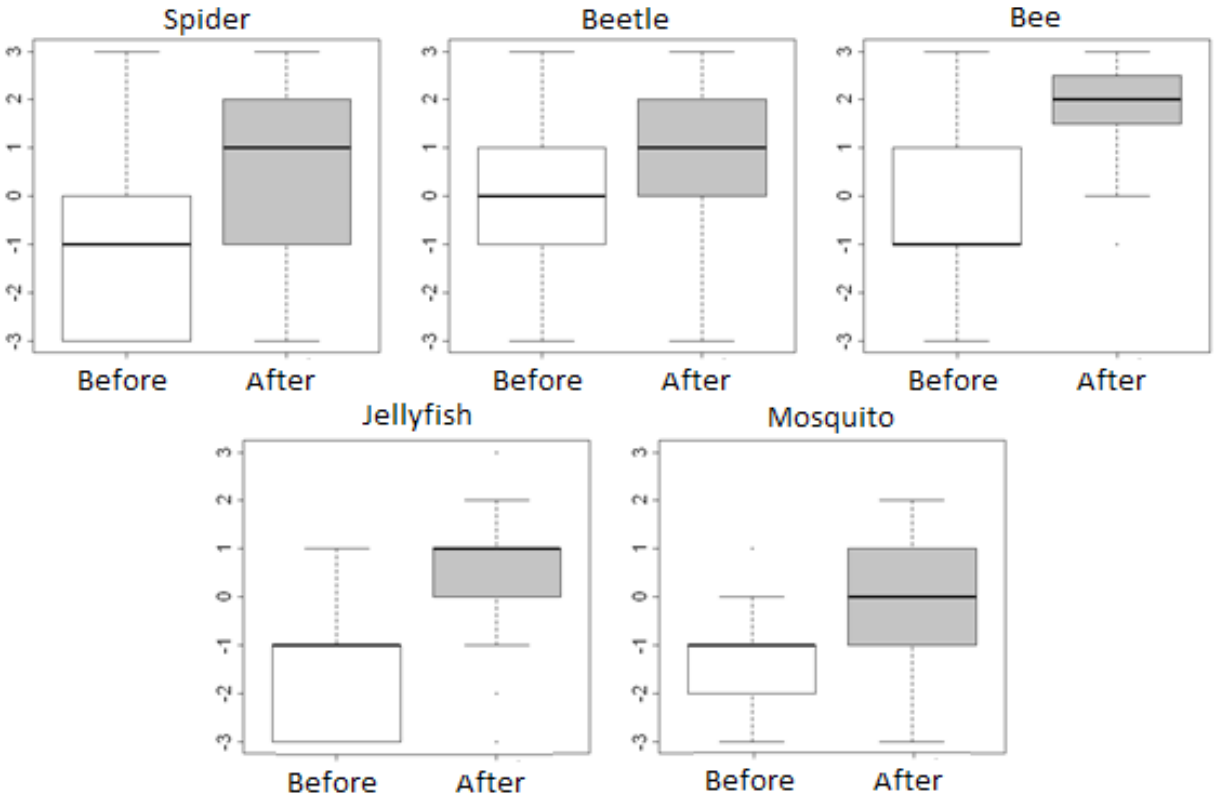
3.2. Perception about invertebrates

Concerning perception of invertebrates, students were asked to describe with 3 adjectives the following animals (Figure 2): spider, beetle, bee, jellyfish and mosquito. Before the intervention, these animals were considered by students as negative-neutral, but after that, perception significantly increased in all cases ($p < 0.001$). These results are in agreement with Drissner *et al.* (2014), where an intervention reflected significant increases in perception towards invertebrates, in particular towards insects, where most negative perceptions are found (Barrow, 2002; Drissner *et al.*, 2010, 2016; Kellert, 1993). In fact, Drissner, Haase, Nikolajek, & Hille (2011) and Drissner, Hille, Debatin, & Haase (2008) demonstrated that

their intervention encouraged students to see small invertebrates as more useful, less dangerous and having more value, thus deserving be preserved.

Figure 2

Boxplot representing students' perception about five invertebrates before (white) and after (grey) the intervention. Scale of values ranges from very negative perceptions (–3) to very positive perceptions (+3)



3.3. Taxonomy and classification

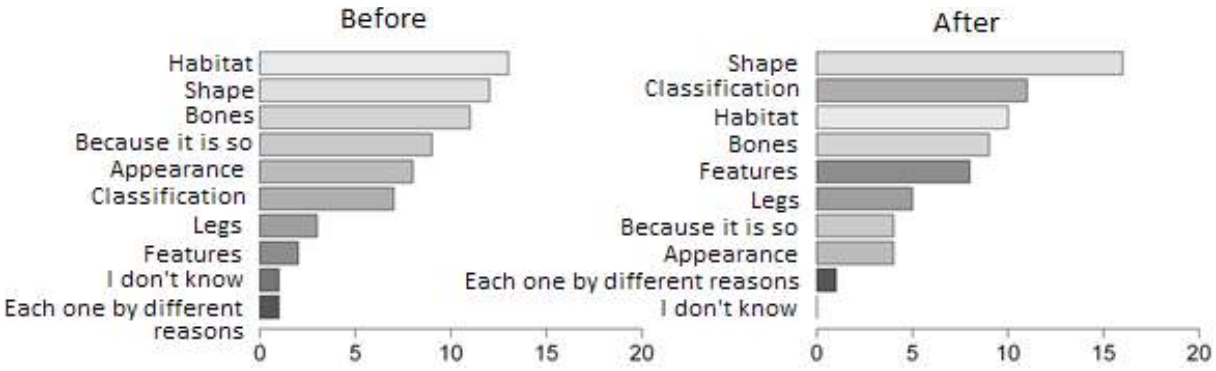
In this study, results differ from those of Yen *et al.* (2007). Here, before the intervention, fewer wrong answers were detected (13-50%), while after the intervention almost 100% of answers were correct. Nevertheless, reasons (Figure 3) given to justify their elections were similar to Yen *et al.* (2007), where habitat and shape constituted the main reason, before the intervention. However, after the intervention, "classification" increased significantly among other reasons, while "because it is so" decreased substantially.

Furthermore, especially before the intervention, students also reflected some alternative conceptions in the True/False statements section, related to misclassification, probably due to classification based on habitat and anatomy (Allen, 2015; Braund, 1991, 1998; Kattmann, 2001; Papadopoulou & Athanasiou, 2015; Trowbridge & Mintzes, 1985, 1988; Yen et al., 2007). Among the three aspects covered in this study, classification showed the highest persistence in terms of alternative conceptions, which results a recurrent area where alternative conceptions persist also among preservice teachers (López, Banos-González, & Esteve

Guirao, 2017; Melero & Gamarra, 2016; Urones, Vacas, & Sánchez-Barbudo, 2010), and even among teachers (Burgoon & Duran, 2012).

Figure 3

Reasons given by students before (left) and after (right) the intervention about why they classified invertebrates inside each taxon



4. Conclusions and Reflections

After the intervention, students showed more awareness of the relevance of invertebrates and more positive perceptions, increased their interest and expressed the usefulness of acquiring knowledge about these animals. Nonetheless, some alternative conceptions are resistant to changes.

This study reflects the relevance of basing the teaching-learning process on previous students' knowledge, as well as the convenience of employing active learning methodologies to encourage reflexive attitudes, interest and to learn to think by themselves critically. Finally, it is important to point out the reduced scope of the study, since a single age cohort is used. In this way, future research should be focus on alternative conceptions of teachers-to-be.

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The UN Sustainable Development Goals in higher education from a Scholarship of Teaching and Learning experience perspective

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Abstract

This study explores in accordance with UN Sustainable Development Goals (SDGs) how global warming, environmental issues and biodiversity related to business as usual could be addressed in higher education. Business schools could be considered to be at the heart of this and sustainability need to be further emphasized in teaching to pave the way for students' learning as future change agents. This study explores how the application of Scholarship of Teaching and Learning (SoTL) could pave way for an intervention aimed for an in-depth understanding of the contribution of sharing about teaching. The findings of the study presents how sharing about teaching activities among scholars might open a broader view on how SDGs could be integrated into syllabuses giving voice to value through intervention among scholars.

Keywords: SoTL, sustainability, teaching, SDGs.

1. Introduction

In terms of sustainability, Leclair, Clark, Ferrell, Joseph, and Leclair (2000) problematize the lack of relevant courses in higher education. Leclair *et al.* (2000) points out that there are often no courses with sufficient focus on sustainability at business schools. Also Lozano, Merrill, Sammalisto, Ceulmans and Lozanao (2017) highlight the need to raise the importance of sustainability in business education, which is in line with McDonald's (2013) argument on how sustainability need to be highlighted in teaching and pave the way for students' learning. Stubbs and Cocklin (2008) describe how the neoclassicist view in business education is simply related to the term "wear and tear" and therefore is perceived to be the opposite of the concept of sustainable development in terms of environmental impact and consumption patterns and or equivalent. McDonald's (2013) problematizes the thinking language business as usual, as one of the core issues to discuss among scholars at business schools. Additionally, McDonalds (2013) claim that sustainability is often unspoken in existing curricula and therefore exists without being communicated. Hence as suggested by Blasco (2011) one solution might be to search for syllabuses Hidden Curriculum, to break down any inertia towards raising sustainability.

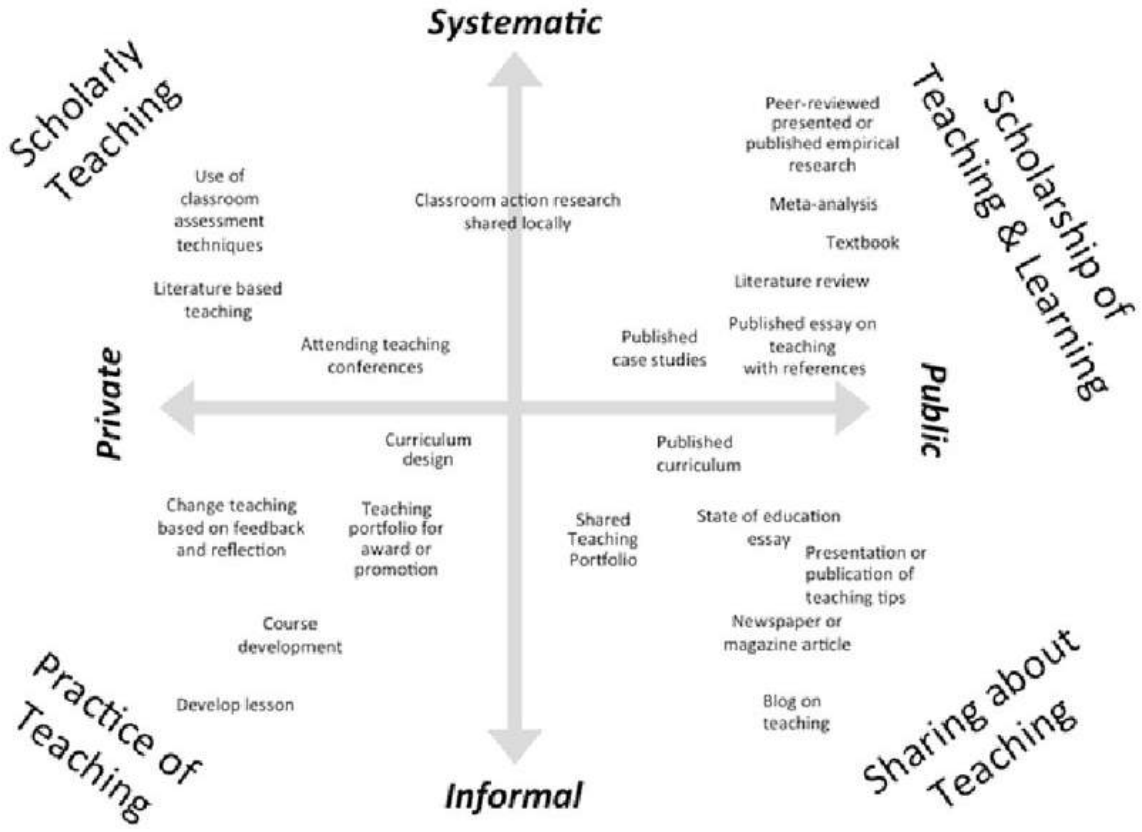
Universities and business schools engaged as signatories for the voluntary UN initiative PRME-Principles for Responsible Management Education could be expected to act as pioneers in implementing the SDGs into course syllabuses. McDonalds (2013) in addition emphasizes the importance of shared active teaching methods in students learning, for example: debates, reasoning and practical orientation, which has been the foundation for this study. The aim of this study is to approach the dimensions of SoTL to explore sustainability in higher education for an understanding of how systematic sharing scholarly teaching could create an intervention among scholars.

1.1. Dimensions of activities for Scholarship of Teaching and Learning

Kern, Mettetal, Dixson and Morgan (2015) argue for the role of SoTL, which presents the learning based on two of the dimensions public/private and systematic/informal *Fig.1.*

Figure 1

The role of Scholarship of Teaching and Learning



The authors emphasize how the essential is the placement along the two dimensions not the activities in themselves. In this study, working with practical examples on classroom action research shared locally approaches the systematic dimension of SoTL and sharing student's presentations through a poster exhibition address the dimension of private/ public. The public dimension helps define teaching-related activities beyond activities often associated with the practice of teaching. Teaching materials that are not shared is clearly not SoTL (Kern *et al.,* 2015). Hence, SoTL does not just happen by itself it requires careful consideration, planning and follow-up. Kern *et al.* (2015) therefore emphasizes the importance of teachers focusing on the intervention and the importance of a scientific approach in the practical learning "teaching that is well grounded in the sources and resources appropriate to the field" (Kern *et al.,* 2015, p. 2). Kern *et al.* (2015, p. 9) put forward the exception of "inquiry focused on student learning" and "conducted in partnership with students" as two principles of good practices connected to SoTL as discipline.

2. Methodology

In this study, a student poster exhibition has been used to explore how barriers in education can be challenged, values and contradictions discussed. The study is qualitative, 17 students at Kristianstad University was participating in the project and 10 posters were presented throughout a sustainability week. As my goal with the exhibition was to intervene with scholars, I placed a white-board in the heart of the exhibition to invite written and oral conversations. In total, it gave me 15 written conversations. *Fig. 2.* I also aimed to encourage an intervention by a post-it-on the wall interaction inviting both scholars and students to post their reflections on the topic. The post-it wall got 59 hits *Fig. 3.* All posters, the empirical material from the post-it-wall and written conversations has been collected and archived. These techniques allowed me to develop an understanding on *why* and *how* sustainability might be integrated into syllabuses (Bryman & Bell, 2011). Four focus groups sessions was performed with students enrolled in the project during the week. Each group session took about one hour. The interviews were conducted in English, as all students apart from two were international students. All interviews were recorded and transcribed verbatim.

Figure 2
White-board conversations

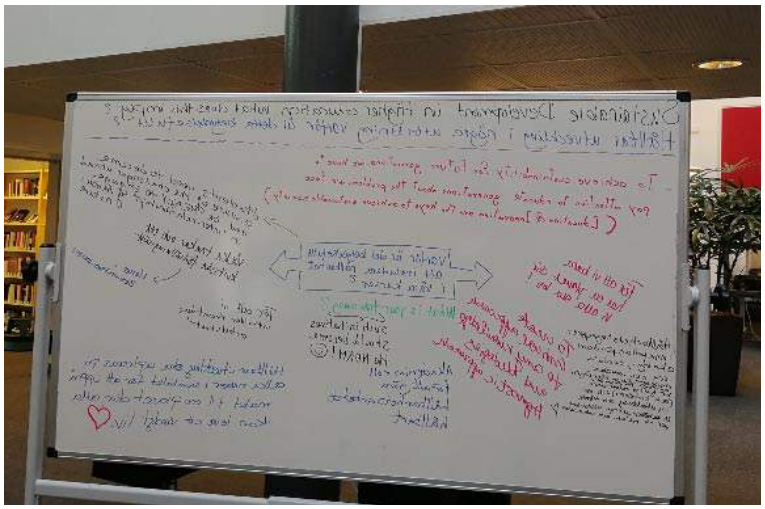


Figure 3
Post-it wall

3. Analysis and Conclusions

As PRME signatories, universities should be at the forefront in highlighting the SDGs, (McDonalds, 2013). Kristianstad University being a PRME Champions signatory overcoming barriers is particularly the case when it comes to implementing the SDGs in different disciplines. As PRME champions we will actively have to convince the program directors to change their course curriculum since most faculty members are keen on their academic freedom. This situation is illustrative for the kind of politics that will most often be present in institutions of higher education. Notwithstanding, this study showed that a cross-disciplinary approach could contribute to an intervention of implementing sustainability in higher education. To overcome barriers for scholars that do not want to consider teaching sustainability in their courses because they believe it does not relate to their field. Hence, such barriers of learning has been addressed through the application of SoTL focusing on

classroom assessment techniques shared locally and conducted in partnership with students. For example, one teacher visiting the poster exhibition pointed out on the post-it wall that

> PRME analogy: PRME is like the methodology part of the thesis: It might not affect the environment itself, but without it, the whole sustainability project would not be possible.

Other examples from the wall show how teaching activities in itself can lead to awareness of the importance for more communication on sustainability and the syllabuses Hidden curriculum in other disciplines, which might help overcome both structural and cultural barriers.

> Happy to see a hands-on example of company "Klippans Yllefabrik AB" becoming sustainable with help of our students, well done student A and student B.
>
> Interesting to see so many connection to health issues.
>
> Great poster presentation! Especially interesting to share sustainability in computer science!

It has been demonstrated how student's posters pave way for the importance of a local arena for collaboration on pedagogy. Presenting some examples of teaching activities of implementing sustainability and SGDs in partnership with students raised awareness of PRME-related activities, especially as it displayed the activities of interdisciplinary departments. Thus, scholarship of teaching can through systematic sharing of classroom action research shared locally pave ways to raise awareness about best practices of sustainability in syllabuses. This study shows how reflexivity particularly entail pedagogies that might encourage awareness for teachers to search for the Hidden Curriculum. To disseminate reflexivity among scholars the focus group interviews with students showed how SoTL could be used as a scientific platform for integration of sustainability within the academic mission of universities

> It is evident from the literature that sustainability or sustainable action can thrive profit, it is not just an idea we have in our head. As generation, Y we will get more and more consciousness and will demand this. If I go to a company, I know that I know more about sustainability, I can be a part of that change.
>
> Even if I will end up working in a small or bigger corporation we will be responsible, of course if I will have two choices I will go for the most sustainable one. In Germany where I come from Nestlé has a bad reputation a big company that have big issues I would not be happy to apply for a job there. I know now that I have the knowledge that I can go there and make a change. I want to be part of that change you know now that you can go there if you have that mindset.

One important lesson that can be learnt from the analysis of student's reflections is the need for integration of sustainability in our courses and program. The integration of the SDGs become evident for our students learning and as such challenges new ways for an intervention and dissemination of teaching activities shared among scholars. (Kern *et al.*, 2015).

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Understanding (In)accessible Education: Exploring the Factors that Promote and/or Deter Equitable Teaching and Learning

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Abstract

While attention to accessible teaching has grown considerably in recent years, evidence suggests that disabled students continue to experience a range of exclusions and barriers within postsecondary contexts (Marquis *et al.,* 2016; Hughes, Corcoran & Slee, 2016). Further attention to addressing such entrenched inequities is thus required. Complementing a wide body of research that explores the relative accessibility of learning contexts and/or evaluates the efficacy of particular interventions aimed at supporting accessible teaching (e.g., Everett & Oswald, 2018; Madriaga *et al.,* 2010), this study investigates contextual, conceptual, and individual factors that mediate change in teaching practices relating to accessibility for disabled students. In particular, we focus here on what motivates—and/or demotivates—instructors to teach in accessible ways.

Data of relevance to this question were drawn from focus groups and interviews with instructors (n=11) and teaching assistants (n=16) at a mid-sized, research-intensive Canadian university. Preliminary findings point toward a range of factors that encourage or discourage accessible teaching, including departmental, disciplinary, and institutional cultures; varying orientations to accessibility; significant encounters that influence teaching practice; and instructor affective experiences. Considering these findings, we argue for further attention within discussions of accessible teaching to the multiple and complex nature of motivation, including its socio-cultural components and its relation to (socially influenced) emotional experiences.

1. Introduction

A variety of legislative and policy developments, including the UN's sustainable development goals, emphasize the need to make postsecondary education accessible to students with disabilities. Despite a growing body of scholarship exploring strategies for enhancing equity in teaching and learning (e.g., Burgstahler & Cory, 2009), disabled students continue to face barriers and exclusions within postsecondary contexts (Marquis *et al.,* 2012; 2016; Hughes, Corcoran & Slee, 2016).

This paper presents the findings of a SoTL project designed to respond to these entrenched inequities: an exploratory, qualitative study that investigated instructor and teaching assistant (TA) experiences of working toward accessible education. Whereas much research focuses on establishing the relative accessibility of learning contexts or on evaluating the efficacy of particular interventions (Everett & Oswald, 2018; Healey *et al.,* 2006; Izzo, Murray, & Novak, 2008; Madriaga *et al.,* 2010; Morina, Cortés-Vega, & Molina, 2015), we instead took a step back, aiming to understand contextual, conceptual, and individual factors that promote or deter accessible teaching.

2. Methodology

We conducted semi-structured focus groups and interviews with instructors (n=11) and TAs (n = 16) at a research-intensive, Canadian university, inviting participants to engage in dialogic exchange about accessible teaching practice. For the preliminary analysis reported here, recordings of 10 sessions were transcribed, and initial coding was completed using a variant of constant comparative analysis (Merriam, 2009).

3. Findings

3.1. Context and culture

Comments speaking to the influence of context and culture demonstrated the ways accessibility efforts are or could be impacted by participants' disciplines, departments, and institutions, or by the specific courses they teach. For example, some participants gestured to the relative presence or absence of conversations about accessibility in their home departments, suggesting that accessible teaching might be motivated by contexts where such discussions are more common. One TA said, "*I feel like I haven't been made aware of teaching accessibly or anything like that. So I don't know if [departmental colleagues are] supportive, or … where they stand on that*" (P9).

Some participants also identified broader disciplinary contexts as motivating/ demotivating factors; this was seen, for example, in one instructor's suggestion that Social Sciences faculty are "*in the habit*" of considering accessibility and thus "*take it seriously*" (P23). Several participants also commented on the impact of institutional supports and processes on motivations to teach accessibly, noting the need for accessibility to be reflected and supported in university priorities, rewards, and training opportunities. Finally, participants also discussed the influence of their immediate teaching contexts, indicating that factors such as course size and structure affect their motivation and capacity to teach accessibly. One TA noted, for instance, "*I taught a very large class ... 600 people or so, and it's very hard to do any type of accessibility ... because there's just too many students*" (P25).

3.2. Orientations to accessibility

In several cases, participants spoke in ways that suggested or named particular orientations to accessibility that shape their motivations and practices. Some positioned accessibility as the "*nice* thing to do," for instance, framing it as a charitable act that might help or fix disabled students (e.g., *"I have always been able to see that people are different. And I try to help them more"* (P7)). Other participant comments reflected a sense of accessibility as the "*profitable* thing to do"—something with practical benefits related to economics, civic development, or instructor teaching practice. For example, one TA stated, "*monetarily and physically… if you have well-performing students, like, your department, you win*" (P1). Participants also spoke to the role of compliance with legislative or institutional mandates, suggesting that, for some, accessibility is seen as a "thing we *must* do" (though those mandates do not always lead to tangible action). As one TA put it, "*legislation is good [for] 'getting everybody to think about it,' but … you can't just turn that piece of legislation into an actual practice*" (P27). Other reported orientations included a sense that accessible teaching is the "*right*" or the "*best* thing to do." The former framing could be seen in comments that considered accessibility from a justice perspective, emphasizing a desire to do right by students and/or to contribute

to more equitable institutions and cultures (e.g., *"I think everyone deserves a good ... education if they want [it]"* (P14)). The 'best thing' framing, on the other hand, reflects understandings that accessible teaching is good pedagogical practice and should be embraced for that reason. Finally, some participants positioned accessible teaching as a "thing we *can/can't* do," speaking to their underlying sense of agency (or lack thereof) to teach in more accessible ways. Some TAs, for example, described occupying a relatively circumscribed role in the teaching environment, with one noting, "*there's only so much we can do, especially if the instructor of the course doesn't want certain things to happen*" (P15). Importantly, these perspectives were not mutually exclusive; several participants made comments aligned with more than one of these orientations.

3.3. Significant encounters

Participants frequently mentioned particular experiences which informed their accessibility practice. These experiences were often personal, related to the participant's social location; as one instructor noted, "*I suffer from mental health disorders … and that's … my motivating factor*" (P6). Other times, participants cited interactions with students, including accommodation requests and student feedback, as influencing their accessibility practices. For example, one TA said, "*my students have taught me how to be more accessible … I take my evaluations seriously*" (P3). Informing experiences also occurred beyond the classroom context, with participants mentioning experiences with family, friends, or peers, such as the instructor who explained: "*I had a nephew who, because of mental illness and an assignment, killed himself. That has always affected my way in which I see students*" (P8). Participants also identified accessibility-related training experiences and/or discussions with peers and colleagues as leading to shifts in their teaching practice.

3.4. Affective experiences

The data also reflect a range of emotional responses that arise in relation to the concept and practice of accessible teaching. For instance, one instructor noted, "*when I do a really good job of [accessible teaching], I feel so proud of [students]*" (P5), while another shared, "*I found it … so stressful that I got a migraine*" (P10). In some cases, participants described the ways in which such emotional factors affect motivations to teach accessibly. One faculty participant noted that some instructors feel overwhelmed at the thought of modifying their teaching practices, for example, pointing out that feeling *"like I have to change everything I'm doing all in one shot … can make it really hard for someone to start*" (P20). In contrast, another instructor described the ways in which positive feelings like excitement might support change in teaching practice: "*I'm excited about it. I like to think I'm open and really welcoming of any opportunity for self-reflection around my personal practice …. So I'm excited about these discussions*" (P22).

4. Discussion

This study intentionally explores the ways in which contextual, interpersonal and affective dimensions inform how participants arrive at, engage with, and make sense of issues of accessibility, contributing to literature that explores how socio-cultural factors enhance or prevent change in teaching and learning (Mårtensson, Roxå, & Olsson, 2011; Moore *et al.,* 2018). While the data suggest that faculty and TA responses to creating

accessible education differ in some areas (empowerment to affect change, knowledge of relevant policies), both groups found it motivating to discuss accessible teaching with others, which encourages us to consider how best to facilitate access to these supportive encounters.

Participants hold multiple orientations toward accessibility (positioning it as the charitable, profitable, right, or best thing or as something that 'must' be done) and describe a range of personal emotions and departmental moods that affect their motivation. This raises interesting challenges for colleagues responsible for designing and delivering training in accessible education. By assuming training attendees already ascribe to or should come to adopt one particular orientation, such as accessibility as the socially-just 'right' or 'best' thing to do, we may be failing to recognize other orientations that motivate faculty/ TAs to make change. While some orientations, like a charity-based framing, have been critiqued by disabled people as problematic, the potential motivating force of others merits further exploration. Additionally, as opposed to prioritizing accessibility theory and skills, accessibility training might play a significant role in affirming worry, easing overwhelm, and generating curiosity and excitement.

Overall, our preliminary analysis suggests the relevance of and need for further examination into the multifaceted dimensions of motivation—not from a psychological perspective necessarily, but with an understanding of the sociocultural context in which accessible education is facilitated on post-secondary campuses. The ways we orient to, talk about, and experience motivation in addressing issues of accessibility matter, as do our general affective states. If we expanded our understanding of 'why' people might come to care about accessible teaching practices and recognized the range of emotions we experience as we work to implement these approaches, we might invite more honest, creative, and collegial discussion, rather than top-down, conflictual, fear-based, isolated compliance with standards.

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'This wouldn't happen if you were using pen and Ink': An exploration of barriers to engaging with learning technology in HE

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Abstract

In September 2018 the UKs joint minister for Higher Education Sam Gyimah urged all universities to provide 'the best possible education experience – one in which digital technology is fully integrated' (JISC, 2018:3). At a broader level most institutions embrace digital technology, one example of this is the common use of virtual learning environments in the HE sector. However, despite universities adopting such platforms, individual academics do not always choose to engage with digital technologies resulting in inequalities of experience for learners.

Encouraging academics to engage with emergent educational technologies (EDtech) is critical in ensuring a contemporary and inclusive learning experience. However, in reality there are many barriers that academics face when deciding to integrate such technologies in their practice.

In September the JISC 'Digital Insights survey' suggested that 'Students are frustrated when teaching staff don't use digital systems competently, especially when this wastes time or reduces access to course materials' (JISC, 2018:13) fuelling debates around the importance of academics use of technology. Previous studies have highlighted some barriers to academics use of technology, however further work is needed to investigate motivations for academic staff to develop their practice in relation to using E-learning technologies and whether training and mentoring opportunities have an impact on this process.

This paper presents the findings of a research study, which evaluates the motivations, practices and outcomes of using technologies such as screen casting, podcasting and student response systems in Higher Education. The study draws upon research with academics and practitioners teaching in the Higher Education Sector. The findings suggest that many academics choose to embed technologies to enhance the student learning experience and this is often derived from their own interest in technology and the observation of others. Many academics identify the use of Edtech as a catalyst for student engagement, which in turn has a positive impact upon the student experience. Barriers to the implementation of Edtech for academics included time needed for training, lack of training and possible negative impact on student learning. Overall, the study concludes that in order to support and motivate staff, institutional, personal and perceptual barriers to the use of Etech need to be addressed.

Keywords: podcasts, screencasts, student response systems, Higher Education.

1. Introduction

Educational technology (Edtech) has the potential to significantly enhance the educational experiences and performance of learners in HE (Ertemer & Ottenbreit-Leftwich, 2013). However, whilst the use of technology in learning and teaching has increasing become more commonplace, the use of e-learning technology by academic or faculty staff has been

adopted sporadically across the context, at times with little or no consideration of pedagogic rationale. This is a cause for concern as the competence of teachers in the design and justification of using Edtech is crucial in its success (Englund *et al.,* 2017).

The expectation for academics to use emergent Edtech in their everyday teaching practice is much debated (Hardaker and Singh, 2011) despite this; there remains very little research that offers insight into the barriers to academics in Higher Education who chose to embrace specific platforms such as screencasts, podcasts and student response systems.

This paper presents the findings of a research study, which evaluates the motivations, practices and outcomes of using technologies such as screen casting, podcasting and student response systems in Higher Education. The study draws upon research with academics and practitioners teaching in the Higher Education Sector and evaluates the potential barriers to using the above, in teaching practice in Higher Education.

The research was conducted by two senior lecturers working in the social sciences at a large Northwest of England University. The researchers had anecdotally noted that their colleagues were often reluctant to engage with e-learning platforms, yet found it extremely rewarding when they were persuaded to give them 'a try'. The paper reports on the preliminary findings of an ongoing research study conducted with academic staff who have taught in HE since 2017. The study was granted university ethical approval in March 2018 and the e-questionnaire will remain live until July 2019. The e-survey link was made available in the public domain and circulated through the researchers Twitter accounts and special interest groups on Facebook. The invitation to participate contained information on the study, anonymity and right to withdraw.

2. Methodology

The methodology for this research was driven by an interpretivist approach that sought to elicit qualitative responses through the use of an e-questionnaire. This subjective approach aimed to understand the barriers and benefits behind academics' use of e-learning platforms and the value individual's place on these in their pedagogic practice. The questionnaire contained some initial diagnostic quantitative responses, however richer qualitative responses were received through the use of a number of open questions.

The decision to make the questionnaire electronic could be considered controversial given the research topic. However, it was decided that in order for respondents to engage with e-learning platforms they must have some proficiency in using the internet. Particularly given the normalisation of e-learning engagement in HE practices. The questionnaire was disseminated using the social media sites Facebook and Twitter.

The use of social media to disseminate questionnaires is becoming more prominent in social research. The power and scope of such mediums in attracting the attention of potential respondents is abundant. For example, Facebook a free social networking site is one of the most popular social media platforms globally and currently has over 2 billion users per month, making this flexible and low cost research tool attractive to researchers (Bennetts *et al.,* 2019). Whilst the actual benefits of using social media as a research tool remain rather underexplored (Arcia, 2014) the potential benefits warranted an exploration of this, particularly given the nature and context of the research.

3. Research Findings

— There were 34 respondents to date. 85% of respondents identified as female and 15% as male. The respondents had taught across a diverse range of subject disciplines including psychology sociology, childhood studies and literature.
— When asked to identify the platforms they had used in their teaching practice Podcasts were the most popular followed by student response systems and screencasts.
— The respondents in the survey discussed their rationales for using technologies in teaching and learning, the perceived benefits, barriers and disadvantages.

3.1. Rationale for Using Technologies in Teaching

Respondents who used technologies in their teaching commented on a range of reasons for the implementation of these. Some respondents noted their own personal interest in technology and the possibilities for enhancing teaching and learning. *"Experimentation driven by a general interest in the use of technology for supporting learning*". Others reflected that the use of technologies improved accessibility and offered different and flexible approaches to delivery of information and increased student engagement *"….to bring further variety to the classroom", "So, it adds something to teaching, keeps it fresh and interesting", "to get feedback from students during class*". Some respondents noted that student expectation was also a factor, *"Students want the latest technology and teaching should move with the times!"*

It was interesting to note that a number of respondents were motivated to use technologies out of the observation of colleagues using them or positive feedback from colleagues about their benefits, "*Seeing effective podcasts by a colleague", "Colleagues who had used them said they were helpful and time-saving".*

Some respondents did not use technologies in their teaching, one commented that their use did not resonate with their personal identity as a teacher, "*I don't, my field is historical, and part of my teaching persona is as someone who does not embrace new technology. The students respond well to this".*

3.2. Benefits of using technologies

Respondents commented upon a range of benefits in using technologies in their teaching many of which mirrored their stated motivations for their use. Student response systems were seen to increase engagement and the opportunity for student feedback in teaching sessions, "*getting anonymous feedback on student progress", "livening up classes", "engaging students differently*", *"Most students are happy to engage, and it gets a much wider response from classroom participants".*

3.3. Barriers and disadvantages of using technologies

There were a number of barriers and disadvantages raised to the implementation of technologies in teaching and learning. Respondents commented on the time required to learn to use them efficiently, "*Time to learn", "Time for training".* Others commented on a lack of effective training or the notion that staff should already know how to use them, *"…there is no training, often you have to find out about these things by yourself", "wanting training but thinking*

they should already know this stuff". Some staff were honest about their lack of confidence, *"fear of technology"*, *"lack of confidence"*, *"the newness of it can make individuals feel overwhelmed"*.

Some respondents raised concerns about the use of technology in teaching and learning and possible negative ramifications, "*it reduces human interaction, which young people desperately need"*, *"The technology should not monopolise the teaching and learning process"*.

4. Discussion

The research revealed a number of institutional barriers to staff embracing new technologies and factors such as 'time constraints' and the 'accessibility of training' were a prominent feature of responses. There are a number of reasons why these areas may be of particular note, but these must be considered in relation to the wider national and institutional HE agendas.

Currently the emphasis upon key metrics such as the Teaching Excellence Framework (TEF), Research Excellence Framework (REF), Graduate Outcomes, National Student Surveys (NSS), all heavily influence the engagement of academics with CPD and their willingness to experiment with technology. In addition, these metrics in turn dictate the CPD offer in general. As more and more departments and faculties feel the pressure of meeting, a number of diverse outcomes.

Interestingly, many of the responses received refer to the role of colleagues in this process, highlighting the significance of peer support and emphasising the importance of peer dialogue between colleagues and the sharing of experience to develop individual practice through a contextual understanding of the practice of others.

Personal barriers to embedding technologies were also noted in the survey responses. These included the individual's personal technological competence. Associated with this was their own personal confidence in their abilities to use technology effectively in the classroom. These issues are especially pertinent when researchers in the area have commented upon the necessity for tutors not only to be competent to use technologies but also to be able to resolve any problems that arise for their students when these are used in the classroom (Volery & Lord, 2000). In some cases, academics are required to bridge competency gaps for themselves and their students. Taylor (2000 cited in Islam, Beer & Slack, 2015) suggests that academics must be able to adopt new technologies as they arise, however the findings from this study suggest that personal competence and confidence levels could work against their ability to do this.

The survey responses also suggested that the academics subject discipline personal academic identity could influence an individual's motivation to embed technologies in teaching. One respondent was clear that the use of technology was in opposition to their teaching persona where as others commented that technology was more useful and appropriate in particular disciplines.

A further interesting and novel finding was the impact of perceptions of the use in technology in teaching on respondents' motivations to utilise them in their own practice. The study illustrated that some academics were wary of the use of technology because of a perceived fear that it would replace traditional teaching, and human interaction to the detriment of students.

Palloff & Pratt (2001) conducted research with university professors, some of whom indicated opinions that students learned more effectively with face-to-face teaching. Our

earlier research (McCabe & Oakley, 2016) suggests that that a blended approach to teaching allows for the strengths of all approaches to be synergised. It is not 'either or' but 'both and'. Also, we would contest that in a digital age a broader and more holistic view, rather than a sole focus on face-to-face as the dominant form of personal interaction, is necessitated. However, it is important that we do not reach the conclusion that 'one size fits all'. Phipps & Merisotis (1999) argue that it is vital that in designing teaching using e-technologies academics must be aware of the diversity of their students and their learning styles and needs.

5. Conclusions

The study confirms positive aspects of embedding technologies in teaching and learning, which have been documented in previous studies. It also illustrates barriers to the use of technologies for staff in higher education institutions. Our findings suggest to address the barriers effectively investment, interventions and support are needed at an institutional, personal and perceptual level.

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Uniendo sinergias para crear Innovación Educativa en el contexto universitario. Elaboración de materiales didácticos audiovisuales e interactivos para la enseñanza de contenidos sobre Nanotecnología

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Resumen

Esta comunicación pretende mostrar la labor conjunta realizada por un grupo multidisciplinar de profesores y alumnos de 3 universidades en el ámbito de la innovación educativa.

El trabajo se circunscribe dentro de un Proyecto de Innovación Educativa (PIE) de carácter internacional concedido por el Servicio de Asesoramiento Educativo (SAE) de la UPV/EHU en la pasada convocatoria del bienio 2018-1019 y supone la implicación directa de alumnado y profesorado de la Facultad de Farmacia de Vitoria-Gasteiz (UPV/EHU), de la Facultad de Ciencias Sociales de Salamanca (USAL) y de la Facultad de Letras de Coímbra (UC).

En un entorno académico donde el alumnado hoy en día es más audiovisual y digital que nunca, es prioritario empezar a trabajar desde el punto de vista docente bajo dicho soporte. Unido a esto, y pensando en el empleo de metodologías activas, se ha pensado en la elaboración de materiales docentes que contemplen una implicación por parte del alumnado directa y activa, con el apoyo del profesorado. Además, hay que añadir que en dicha elaboración está implicado alumnado y profesorado de campos tan distintos como la ciencia, la tecnología y la comunicación audiovisual, pretendiendo su convergencia y buscando la sinergia entre ambas actividades.

Se considera, por tanto, que este PIE se enmarca dentro de un nuevo contexto educativo universitario donde "el aprender y el enseñar" se unen en este caso de forma inter y multidisciplinar bajo un soporte multimedia, rompiendo con ellos espacios y fronteras académicas.

Abstract

This communication aims to show the joint work carried out by a multidisciplinary group of professors and students from 3 universities in the field of educational innovation.

The work is circumscribed within an international Teaching Innovation Project (PIE) granted by the Educational Advisory Service (SAE) of the UPV / EHU in the last call of the 2018-1019 biennium and involves the direct involvement of students and faculty of the Faculty of Pharmacy of Vitoria-Gasteiz (UPV/EHU), of the Faculty of Social Sciences of Salamanca (USAL) and of the Faculty of Arts and Humanities of Coimbra (UC).

In an academic environment where students today are more audiovisual and digital than ever, it is a priority to start working from a pedagogical perspective under this support. Coupled with this, and

thinking about the use of active methodologies, it has been developed teaching materials that include involvement by the direct and active student body, with the support of teachers. Moreover, it should be added that this process involves students and teachers from fields as diverse as science, technology and audiovisual communication, seeking convergence and seeking synergy between both activities.

1. Introducción

Siguiendo una filosofía de trabajo de colaboración multidisciplinar entre universidades y áreas de conocimiento, en los últimos años se están llevando a cabo una serie de proyectos de innovación educativa entre grupos de trabajo de las Universidades del País Vasco (UPV/EHU), Salamanca (USAL) y Coímbra (UC)[1]. Estos proyectos se desarrollan dentro de una perspectiva metodológica que apuesta porque el alumnado adquiera conocimientos y competencias en un marco de aprendizaje autónomo y activo teniendo siempre como referencia el contexto profesional actual[2,3]. Se incide, además, en las grandes potencialidades que abren los nuevos contenidos digitales, desde el punto de vista de innovación educativa dentro del contexto universitario.

El PIE titulado *"Elaboración de materiales didácticos en el campo de la nanotecnología a través de píldoras audiovisuales multimedia"* enlaza con el modelo educativo IKD (aprendizaje cooperativo y dinámico), promovido por la UPV/EHU, y sus planteamientos metodológicos se fundamentan en los aspectos aportados por el Espacio Europeo de Educación Superior.

A este respecto, se ha elegido como "materia prima" del proyecto la Nanotecnología, ya que, resulta de gran interés en la formación tanto de graduados en Farmacia[4] como en Ciencia y Tecnología de los Alimentos[5].

Se pretende ampliar los conocimientos por parte del alumnado de la UPV/EHU en el campo de la nanotecnología tanto en la investigación e innovación en salud como en el campo alimentario, la cual está despuntando por el gran número de aplicaciones que ofrece de cara a un futuro desarrollo tecnológico e industrial. Al mismo tiempo y con el objetivo de unir sinergias el alumnado de la USAL y de la UC desde las asignaturas de *Géneros Audiovisuales* y la asignatura de *Jornalismo Multimedia* elaborarán contenidos digitales e interactivos vinculados a la citada materia de nanotecnología. Se materializa con ello una práctica pedagógica innovadora que une materias de áreas y grados muy diversos con un objetivo común.

2. Objetivos

Dos son los principales objetivos de este proyecto:

— Elaboración de material didáctico digital relacionado con la nanotecnología.
— Diseño y creación de una plataforma web que albergue contenidos multimedia e interactivos sobre la aplicación de la nanotecnología en la industria farmacéutica y alimentaria.

3. Metodología

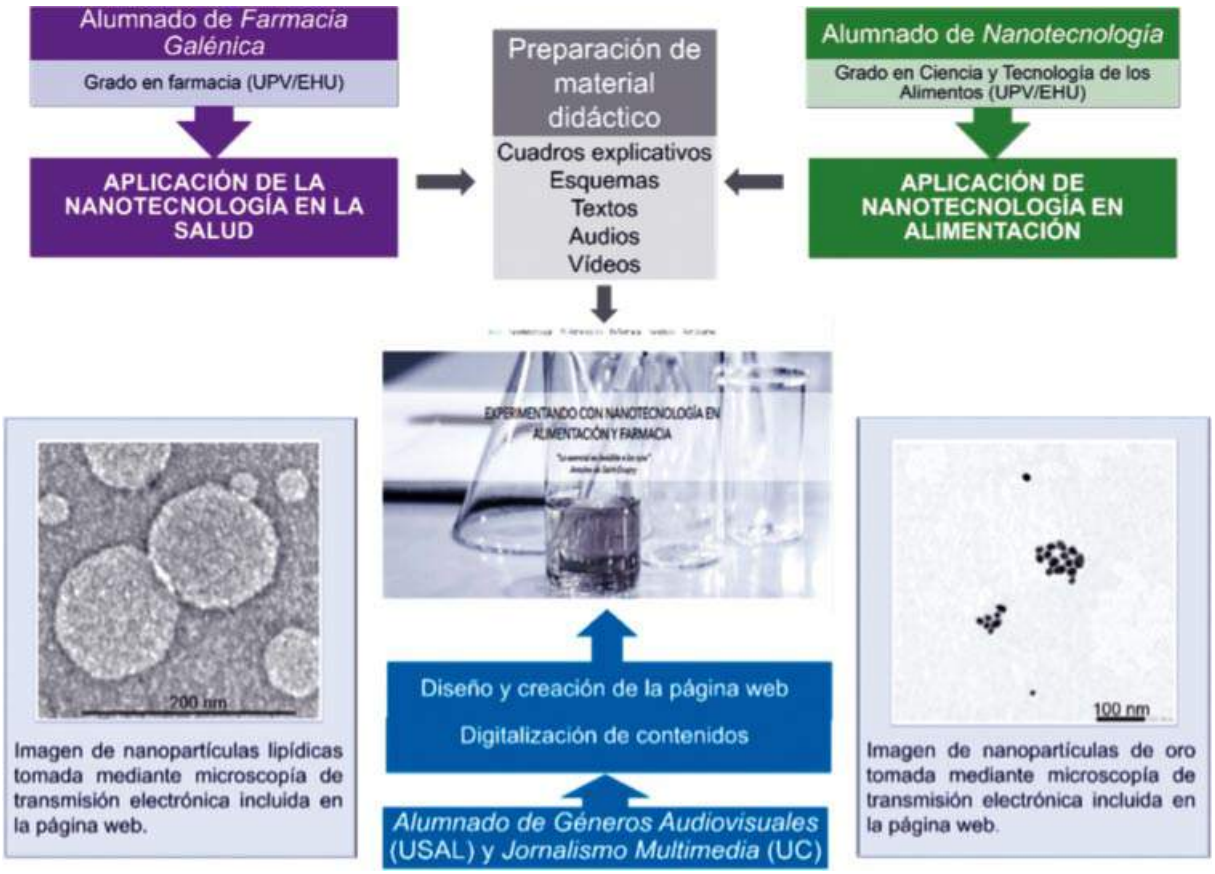
La metodología docente que se utilizará para llevar a cabo este PIE parte de un trabajo colaborativo entre profesorado y alumnado de tres instituciones académicas, de tal manera que, desde la UPV/EHU se elaborarán los contenidos de nanotecnología con una aplica-

ción específica en la industria farmacéutica y alimentaria. Concretamente trabajarán desde el punto de vista didáctico dentro de las asignaturas de *Nanociencia y Nanotecnología,* del Grado en Ciencia y Tecnología de los Alimentos y de *Farmacia Galénica,* del Grado en Farmacia. Desde la USAL, en la asignatura de *Géneros Audiovisuales,* del Grado en Comunicación Audiovisual y de forma conjunta con la UC, dentro de las asignaturas de *Laboratorio Multimedia II y IV* del Grado en Jornalismo e Comunicação, adaptarán dichos contenidos al formato digital e interactivo. Ver figura 1.

Otra de las principales innovaciones que implica este PIE es que el alumnado de la UPV/EHU profundizará en el conocimiento práctico de la nanotecnología a través de la realización y grabación de varias sesiones prácticas sobre la preparación, caracterización y evaluación en cultivo celular, de diferentes tipos de nanopartículas, siendo esta particularidad especialmente innovadora dentro de la enseñanza de las asignaturas, puesto que la grabación de dichos contenidos no forma parte de la metodología docente habitual. Concretamente la evaluación consistirá en la preparación de sistemas de administración de material genético para su aplicación en terapia génica, así como en la síntesis de nanopartículas de oro y su aplicación en el campo de la tecnología alimentaria. La grabación resultante de dichos experimentos, así como otros contenidos teóricos sobre la materia serán posteriormente transformados en contenidos multimedia e interactivos por alumnado de la USAL y la UC que serán publicados en una plataforma web.

Figura 1

Esquema de la metodología seguida en el PIE



4. Desarrollo

4.1. Elaboración de los contenidos de la página web

Se ha determinado que la página web llevará por título "Experimentando con la nanotecnología en alimentación y farmacia", a la que se podrá acceder en el siguiente enlace https://proyectonanotecnol.wixsite.com/pienanotecnologia y se han diseñado los contenidos y la estructuración de la misma. Se han definido 6 pestañas: Inicio, Nanotecnología, Nanotecnología en Farmacia, Nanotecnología en alimentos, Nanobook, Participantes, donde se albergarán los contenidos multimedia e interactivos sobre las mismas, como así se puede apreciar en la figura 2:

Figura 2
Página de inicio de la página web

4.1.1. *Elaboración de material didáctico digital sobre conceptos generales de Nanotecnología*

En este primer apartado de la página web se pretende elaborar material relativo a aspectos generales de nanotecnología, como son, la definición, posibles áreas de aplicación, aspectos legislativos y tipo de sistemas nanotecnológicos. Entre los materiales elaborados destacan varios vídeos uno sobre la elaboración de nanopartículas de oro,[6] elaborado por el alumnado de la UPV/EHU. Dichos vídeos posteriormente serán incluidos en la plataforma web.

4.1.2. *Elaboración de material didáctico digital sobre Nanotecnología y alimentación*

Los contenidos de esta página web relativos a Nanotecnología en Alimentación, se han elaborado mediante la realización de cinco prácticas de aula de la asignatura de *Nanociencia*

y Nanotecnología. Se han formado grupos de trabajo de tres alumnos encargados de la realización de cada apartado y se ha dirigido el trabajo de cada grupo en aras de una mayor especialización y buscando la concreción. También se han abierto debates sobre el diseño de la página con el objetivo de conocer su opinión como potenciales usuarios de esa página web y que posteriormente han sido compartidos con el alumnado de la USAL y UC para su materialización.

Dentro de esos contenidos cabe destacar la elaboración de un "Nanobook". Este material docente es el resultado directo de la participación del alumnado en las clases y que ha plasmado en un contenido interactivo como así se puede apreciar en la figura.3.

Figura 3

Imagen de portada del Nanobook correspondiente al curso 2018/19

4.1.3. *Elaboración de material didáctico digital sobre Nanotecnología y Farmacia*

La confección del apartado correspondiente a *Nanotecnología y Farmacia* se ha realizado a través de un trabajo en grupos de 4 alumnos. El material didáctico será recogido en esta sección de la página web y se centrará en 4 apartados principales: nanodiagnóstico, nanobiosensores, nanoterapia y nanomedicina regenerativa, que han sido determinados en el aula y compartidos con el alumnado de la USAL y la UC que en este caso tendrá como objetivo digitalizar dichos contenidos.

5. Resultados

La metodología docente que contempla la multidisciplinaridad entre áreas tan diversas como la Ciencia y Tecnología y las relacionadas con la Comunicación y la Información han dado como resultado la elaboración de materiales didácticos innovadores. Ahora bien, el ver-

dadero valor educativo radica en la eficacia de dichos materiales a la hora de llevar a cabo el proceso de "enseñanza aprendizaje" y sobre todo en la evaluación de las asignaturas implicadas en este PIE.

Se ha diseñado el siguiente cuestionario con el fin de conocer el grado de satisfacción del alumnado sobre la metodología que se ha utilizado para la enseñanza de la materia de nanotecnología en las citadas asignaturas.

Figura 4

Cuestionario para conocer el grado de satisfacción del alumnado

Responde a las siguientes preguntas

1. ¿Tu participación en la realización de la página web te ha supuesto un mayor y mejor conocimiento de esta materia?
2. ¿Tu participación ha estimulado tu interés?
3. ¿Consideras interesante este tipo de iniciativas como método de aprendizaje?
4. Por último, crees que esta página web puede ayudar a obtener un mejor rendimiento académico?

La implementación definitiva de esta nueva metodología se contempla el próximo curso académico 2019/20, donde se podrá realizar una evaluación comparativa en cuanto a resultados académicos entre el alumnado que ha utilizado este tipo de materiales digitales y los que no.

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The use of digital technology for teaching and learning – a pilot study of social work students' experience of using a recording studio for role-play

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Abstract

This paper discusses the potential of advances in digital technology for assisting teaching and learning for social work students. It looks at a novel approach to teaching practice skills in the discipline of social work and its use for transdisciplinarity. The group of students referred to here are a unique group of learners. The Bachelor of Social Work (BSW) in University College Cork is a full-time undergraduate degree and is open to mature students only. It has a unique place nationally and is the only programme of its kind in Ireland that leads to a professional qualification in social work specifically for non-traditional students. Due to the age profile, backgrounds and experiences of students, the teaching of social work skills can be challenging. Some of these challenges and advances in technology to assist skills teaching will be considered here, as well as the conceptual frameworks that underlie the approach to teaching. Key principles of Universal Design for Learning will be explored in the context of some early stage empirical research undertaken with students engaged in skills learning. Some attention will also be given to how advances in digital technology can assist a more enhanced, inclusive and collaborative learning environment for students.

Keywords: Social work, video recording, reflective practice, communication skills, peer learning.

1. Introduction

Social work in Ireland is regulated by CORU (Regulating Health & Social Care Professionals). One of the functions of the Social Workers Registration Board is to set the standards of proficiency for social workers. The standards of proficiency are the threshold standards required for the safe and appropriate practice of the profession in Ireland. They are the knowledge, skills, competencies and professional attributes for the safe practising of the profession. The standards of proficiency are the standards required for all entrants to the register (CORU, 2018). One of the core proficiencies is *effective communication,* where students are expected to demonstrate a capacity to engage with service users effectively and to demonstrate a satisfactory level of interpersonal skills. The module dedicated to teaching and learning practice skills is known as the *Practice Skills Laboratory*. The social work programme in UCC is a generic social work programme and designed to equip students with transferrable skills that can be applied in all areas of practice. The following sections will detail some of the theoretical frameworks that inform the teaching and learning of communication skills.

2. Reflective Teaching and Learning in the Context of Skills Laboratory

According to Trevithick *et al.* (2004) good communication is at the heart of best practice in social work. Social work programmes have a responsibility to prepare students

for practice. It is also crucial that social work education about the "interpersonal nature of communication and its place within the social work task is conveyed to, understood and practised by pre-qualifying students rather than simply emphasising the regulatory demands to develop skills placed on them by external bodies" (Bolger, 2013, p. 197). The module content of the skills laboratory provides students with the opportunity to develop basic social work skills and to develop a critical understanding of self and others in a variety of professional contexts. The concept of reflective teaching and learning is presented to social work students in year two of their studies. This framework is a useful tool for mature students as they become central observers to themselves and others. Student learning is experiential in that "learning is through doing" that also involves "learning through reflecting on the doing", (Schon, 1983). Rogers (1969, p.5) defines the essence of experiential learning as having "a quality of personal involvement – the whole person in both his feelings and cognitive aspects being in the learning event". Similarly, Thompson, (2015) discusses the three essential components of learning: the Think-Feel-Do framework. The first necessary element is the cognitive dimension (*thinking*) where students need to consider what they are doing instead of applying themselves to situations in way that is robotic and formulaic. He warns of the danger in not thinking about what we are doing and that it can "desensitize us to potential problems and pitfalls" (Thompson and Thompson, 2008 in Thompson, 2015, p. xvii). The second relates to the affective dimension or *feeling* where students need to recognise that "the process of learning involves feelings as well as thoughts and actions" (ibid). The third dimension, *doing*, involves practising ideas and developing and building on skills. The practice skills laboratory focuses on each of these three elements using "active learning mehthodologies" (Ni Raghallaigh & Cunniffe, 2013).

3. Practice Skills Laboratory: The Process

The skills laboratory allows students opportunities for simulated practice. As part of the reflective model students are introduced to role-play and the scaffolding of this is central to the teaching of the module in the first semester. Initially students can find it difficult to envisage themselves role-playing as it requires an element of risk-taking where students can feel uncomfortable and exposed. Therefore, a lot of facilitation has to take place to make the conditions of role-playing optimal. The ideal learning environment is one where students feel supported by their peers and facilitator, where they feel safe to test out new or different approaches and where students receive clear and constructive feedback. For this group of students, each student was set the task of making it public in the learning group what they needed as individual learners to make the group a supportive learning environment and what they were willing to contribute to the group in order to facilitate this type of learning. Each student was then given a contract where the group's commitment as well as the each individual student's commitment to creating a supportive learning environment was made explicit.

A number of challenges have been recognised in facilitating such an interactive and experiential module (ibid, 2013; Dinham, 2006). For this particular group of mature students, many come with years of life experience and, therefore, have become unconscious and somewhat oblivious to *how* they do things and how they might be perceived by others. Schon (1983) talks about the importance of not only acting but noticing how we act and this is something that is a prerequisite for practice. The skills lab is a space where students get to develop and test out their communication and interviewing skills by engaging in both live and recorded role-plays. They also get the opportunity to 'view and review' recorded role-plays where wider class discussion, peer feedback and individual reflection takes place.

4. Pilot Study

The aim of the pilot was to explore a new state of the art recording studio as a potentially effective method in the delivery of a skills module among social workers in training. The rationale for undertaking this pilot was a result of a review of student feedback. The aim was to redesign the aproach to practice skills teaching incorporating principles of Universal Design for Learning. The objectives were to (i) move away from the traditional hand-held camera method of recording student role-plays during class time. Students instead used the recording studio outside of class time to record their role-plays, thus allowing students greater autonomy (ii) use digital feedback to stimulate student engagement (iii) reach out to colleagues/students in other departments working towards mutual goals in teaching practice skills – it was hoped that social work students and student nurses could role-play together.

All role-play recordings took place University's new recording studio. It is a video and audio recording facility which can be used by both staff and students. The studio allows users to record video presentations onto USB keys. The room is a self-service function and is designed not to require support. When role-plays are recorded against a green screen, they can later be edited to include a backdrop of choice, for example, an office setting, hospital background or family living room, depending on the practice context of the simulation. The facilitator can also embed digital prompts throughout the recording. All students in the pilot used the recording studio. Students were given different simulated practice scenarios to role-play with some playing the role of the social worker and some playing the role of the client. Some students volunteered to do a role-play with students from the school of nursing. Once students recorded their practice scenarios they emailed their recordings to the facilitator who prepared them for class.

5. Discussion & Conclusion

The feedback was overwhelming positive. Students seemed to appreciate an inclusive approach to trying out new methods of teaching and learning practice skills where their input and feedback was gathered at each stage of the process. Similar to other studies (Ni Raghallaigh & Cunniffe, 2013) the pilot highlighted that environment matters to student learning and that the climate in which learning takes place is of central importance. The recording studio not only provided them with a professional and student-friendly environment in which to record their role-plays, it allowed them to be autonomous learners and provided them with a level of flexibility. Students also commented that digital feedback provided a springboard for them in facilitating active peer engagement and feedback. Another key finding was that transdisciplinary collaboration provides a richer and more authentic learning experience for social work students and extends the breadth of learning. Despite students' initial reservations about role-play, they believed in the value of role-play for the teaching and learning of social work skills, and ultimately wanted more!

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Teachers' Professional Identity as Inquirers: the Voice of Teacher Educators

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Abstract

This study reports on teacher educators' perceptions of research in teacher professional identity. Teachers, as professionals, needs more than just develop and acquired teaching and management skills. Society demands that teachers develop certain competencies that allow them to face educational complexity. Skills such reflection thinking, use educational research to improve their practice, produce educational knowledge and know how to use tools for analysing the context of the education, are essential for teachers in the 21st century. Therefore, it is necessary to educate inquiry-oriented teachers during the initial teacher education and help them to develop a teacher professional identity as inquirers.

The study was guided by two research questions: 1. What are the positions repertoires that teacher educators acknowledge in primary teachers? 2. How is research considered in different positions repertoires?

Nineteen teacher educators participated in the study through individual self-reports.

The results show that the teacher educators acknowledge three main positions in the teacher professional identity: as an *instructor*, as a *mediator*, and as an *inquirer*. Considering which position is the predominant we have identified four different repertoires of positions: *mediator position*, *instructor position*, *balanced positions,* and *mixed position*. Related teacher educators' perceptions about the function of research we identify differences and similarities between clusters.

1. Introduction

The research focused on how research-based teacher education (TE) programs influence the construction of teacher's professional identity (TPI) as inquirer have a special interest in the last two decades (Afdal & Spernes, 2018; Niemi & Nevgi, 2014).

Research-based programs in TE is a requirement and aim in policies, educational research, and TE practices (Darling-Hammond, 2017). A central aim of this kind of programme is to educate inquiry-oriented future teachers (Toom *et al.*, 2008; Munthe & Rodge, 2015). This approach facilitates the develop of critical reflection and problem-solving skills and enable future teachers to take the position as knowledge creators rather than knowledge recipients (COM, 2007; Taylor, 2017).

There is some literature about the appreciation and participation of the student's teacher in research-based programs (Yancovic-Allen, 2018). However, although the role of teacher educators seems crucial (Darling-Hammon, 2006; Lunenberg, Dengerink, & Korthagen 2014) there has been less research about how they perceive the relation between research and teaching or how they can help to develop an inquiry teacher's orientation.

The Dialogical Self Theory (DST) in education provides a new view in the study of the development of TPI (Meijers & Hermans, 2018). This dialogical approach lies in the definition of teacher identity, which is composed of multiple positions that work as a dynamic system in the landscape of the human mind (Akkerman & Meijer, 2011). We define the concept of

position as the performance of a specific professional function. Also, the DST provides a lens for understanding a different kind of social relationships that allow the development of professional identity and their influence on it (Hermans, 2001). Thereby, the DST can help to understand how teacher educators guide student' teachers doing the transition from a position like a student to a position like a teacher and to understand how identity is socially constructed over time (Hermans & Gieser, 2012).

Teacher educators play an important role and are one of the most influential parties in the development of TPI (Izadinia, 2018). While there has been increasing attention to teacher identity within the academic literature internationally (Hamilton & Clandinin, 2011), there is not yet substantial research on how teacher educators might support teacher identity development (Beauchamp & Thomas, 2009; Izadinia, 2013) and specially teacher identity as inquirer. This study aims to make a first approximation on the subject

The aim of this study was understanding the teacher educators' perceptions about which are the main positions that teachers should develop and how research are considered on the TPI. To achieve this aim, we identify two objectives:

— *Objective 1*: What are the positions repertoires that teacher educators acknowledge in primary teachers?
— *Objective 2*: How is research considered in different positions repertoires?

2. Method

Participants were 19 volunteer teacher educators (10 female and 6 male) from a Catalan University.

Teacher educators' perceptions about research on TPI were collected through a written self-reports called *Teacher Professional Identity* (TePi) during the academic year 2018-2019. The instrument had two sections. The first one called "*The future primary teachers*" collect the perceptions about which are the main functions in teachers' work; the second section called "*The research and the practice-based research in the classrooms*" collect the teacher educators' perceptions about research.

Data were analysed using content analysis methods. We doing an iterative coding process, which consisted of five steps. Firstly, we reading recurrently each self-report to understand the information and to become familiar with the content. Secondly, we decided the unit of analysis based on meaning. Statements were categorized between functions and research perceptions. We established a total of 103 statements (77 relate to the functions and 26 refers to teacher educators' perceptions about research). Thirdly, statements referred to the functions were analysed identifying the emerging positions. Fourthly, statements referred to the research conceptions were analysed related to the functions that teacher educators give it. Finally, we analysed the relations between emerging positions and conceptions about research.

To assess the inter-rater agreement level, two independent researchers analysed the totality of the statements by reaching 86,76% agreement and discussing the questionable cases until reaching consensus.

3. Preliminary Results

3.1. What are the positions repertoires that teacher educators acknowledge in primary teachers?

Preliminary results allow us identify 3 main positions: *mediator* (45,45%) related to the functions that involve an affective and relational character, *instructor* (42,86%) related to the functions with an academic character such as the planning and design of UD, management of the class group and attention to diversity (DUA), and *inquirer* (11,68%) related to functions that on the one hand imply the permanent formation of the teachers and on the other the creation of knowledge and the analysis and improve the teaching practices.

The analysis of their frequency and their combination allow us to identify four teacher educators' clusters: *mediator position* (10,53%), *instructor position* (21,05%), *balanced positions* (42,11%) and *mixed positions* (26,32%).

3.2. How teacher educators understand the research in each one of the repertoires of positions

Differences and similiters among the understanding about research in each one of the repertoires of positions will we discuss in the presentation.

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Reflexión sobre el papel de los equipos de mejora a partir de la medición de la percepción de sus participantes

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Resumen

En esta comunicación se pretende explorar la percepción de valor del profesorado novel con relación a los equipos de mejora como herramienta para el avance en la práctica docente. Concretamente, se han medido, mediante cuestionarios, los resultados de satisfacción de su participación en equipos de mejora de la docencia en el marco del Programa de Desarrollo de Competencias del Profesorado Novel de la Universidad de Deusto y se ha contrastado el resultado con la literatura disponible.

El nuevo paradigma de formación que emerge tras el acuerdo de Bolonia exige al profesorado asumir un rol de facilitador que requiere el desarrollo de sus competencias profesionales.

En este trabajo se pretende contrastar las ventajas que ofrecen los equipos de mejora, tanto a nivel profesional como personal (Sánchez y Mayor, 2006; Van Lankveld, Schoonenboom, Croiset, Volman y Beishuizen, 2017; Van Lankveld *et al.,* 2016), así como sus posibles inconvenientes en cuanto a coste (Sánchez y Mayor, 2006) y dispersión y fragmentación (Gómez, M., Escofet, A. y Freixa, M., 2014; Van Lankveld *et al.,* 2016).

Se valora también la importancia de la figura del facilitador como referencia para la reflexión sobre la práctica docente. Finalmente, se exploran los elementos clave para que un equipo de mejora funcione, atendiendo a tres esferas: la procedimental (Fabela-Cárdenas y García-Treviño, 2014; Karlsen y Larrea, 2015), la contextual (Gómez *et al.,* 2014; Karlsen y Larrea, 2015) y la relacional (Gómez *et al.,* 2014).

Abstract

This communication will explore the perception of the value of novice teachers in relation to improvement teams as a tool for enhancing teaching practice. Specifically, the satisfaction results of their participation in teaching improvement teams have been measured, using questionnaires within the framework of the Programme for the Development of Competences by Novel Teaching Staff at the University of Deusto, and the results have been compared with the available literature.

The new training paradigm that emerges after the Bologna Agreement demands teachers to assume the role of facilitator that requires the development of their professional competencies.

This paper intends to contrast the advantages offered by improvement teams, both at a professional and personal level (Van Lankveld, Schoonenboom, Croiset, Volman and Beishuizen, 2017; Sánchez and Mayor, 2006; Van Lankveld *et al.,* 2016), as well as their possible disadvantages in terms of cost (Sánchez and Mayor, 2006) and dispersion and fragmentation (Gómez, M., Escofet, A. and Freixa, M., 2014; Van Lankveld *et al.,* 2016).

The importance of the figure of the facilitator as a reference for reflection on teaching practice is also valued. Finally, the key elements for an improvement team to succeed are explored, focusing on three spheres: procedural (Fabela-Cárdenas and García-Treviño, 2014; Karlsen and Larrea, 2015), contextual (Gómez *et al.,* 2014; Karlsen and Larrea, 2015) and relational (Gómez *et al.,* 2014).

1. Introducción

La Universidad de Deusto, tras el cambio de paradigma de enseñanza-aprendizaje introducido en su Marco Pedagógico de 2001 (Universidad de Deusto, 2001), apuesta, no solo por renovar su modelo de formación para estudiantes, sino también para el profesorado. Para

ello presta especial atención a sus planes de formación docente como el Plan de Formación de Profesorado Novel, que en el curso 2018/19 finalizará su segunda edición, con una dedicación de 200 horas por cada participante.

En este plan los equipos de mejora constituyen el eje alrededor del cual se articula la formación: en equipos interdisciplinares los participantes deben desarrollar un proyecto conjunto de mejora docente, desarrollando así las competencias docentes y, entre ellas, la colegialidad, como modo de intensificar su aprendizaje (Aláez, Arruti, Ferrán, Quevedo y Romero, 2018).

Ahora, tras la segunda edición, en la que ya se han implementado algunas acciones de mejora, se ha creído conveniente hacer un análisis de contraste entre lo que dice la bibliografía sobre los equipos de mejora y las impresiones del profesorado participante y de las facilitadoras del proceso. Así, se ha pasado un cuestionario anónimo a un total de 25 profesores (12 de la primera edición y 13 de la segunda) y a las 6 facilitadoras. Las preguntas siguen una escala de 1 a 5, siendo el 3,5 nuestro valor de referencia, y en algunos casos son de respuesta abierta.

Se presentan a continuación los resultados del estudio con las preguntas agrupadas por temas.

2. Ventajas y desventajas percibidas en la experiencia

Las ventajas percibidas por el profesorado participante, al igual que ocurre en otros estudios, son tanto profesionales como personales. Las principales coincidencias tienen que ver con la ruptura de la sensación de aislamiento del docente, al constituir comunidades de práctica al estilo de Wenger y Wenger-Trayner (2015). Así, coincide con el de Sánchez y Mayor (2006) en la ventaja fundamental en relación con la oportunidad de compartir experiencias entre compañeros (4,4), de reflexionar sobre la propia práctica (4,3), mejorar las relaciones entre compañeros (4,3) y de sentirse acompañados en el proceso de aprendizaje de la profesión docente (4,1), lo cual es también apuntado por Van Lankveld *et al.* (2016), al referirse a los equipos de mejora como un espacio que estimula el aprendizaje mutuo y logra explicitar el conocimiento tácito. Son estas cuestiones relacionadas con el refuerzo de la identidad profesional docente que ponen de manifiesto tanto Van Lankveld *et al.* (2016) como Van Lankveld, Schoonenboom, Croiset, Volman y Beishuizen (2017).

Sin embargo, el profesorado comunica una percepción notablemente diferente en relación con otras ventajas que son señaladas por estos y otros autores. Así, no conceden importancia a la mejora de la autoestima (2,9) ni al bienestar dentro de la organización (3,3) que aducían Topping (2005) y Patton y Parker (2017); tampoco especialmente a los avances en habilidades de comunicación e interacción social (3,6) que Topping (2005) señalaba ni al avance en creatividad (3,6) apuntada por Gómez, Escofet y Freixa (2014).

Por otra parte, los inconvenientes percibidos se concentran alrededor del excesivo número de tareas del personal docente-investigador (4,2) y, de forma más atenuada, en la dificultad de cuadrar agendas (3,1), lo que coincide con lo concluido por Sánchez y Mayor (2006). Sin embargo, la necesidad de gestionar la diversidad no es considerado un problema (2,2), a diferencia de lo aflorado en el análisis de Gómez *et al.* (2014), en el que las características personales de sus miembros pueden incidir negativamente en el resultado.

3. El papel de las facilitadoras

El papel de las personas que acompañan a estos equipos, las facilitadoras, es considerado un aspecto clave para su funcionamiento. En relación con la función que desempeñan, los resultados señalan que, tanto para estas como para los participantes, su papel fundamental es acompañar a reflexionar sobre el proceso de docencia y, en segundo lugar, posibilitar el intercambio de experiencias. En la Universidad de Deusto, la revisión y autoevaluación para la mejora continua de la labor docente es de vital importancia y es una de las competencias clave del profesorado. Estos resultados avalan esta cuestión.

En la revisión de la literatura, Sánchez y Mayor (2006) corroboran los datos anteriores. Concretamente, consideran necesario que los facilitadores desarrollen ellos mismos una actitud reflexiva frente a la labor docente, para así promover, a su vez, una reflexión en el grupo que acompañan y posibilitar el necesario intercambio de experiencias. No obstante, según estos mismos autores, la labor principal del facilitador sería servir de guía, apoyo y consejo para los equipos de profesorado novel, acompañándoles a desarrollar sus competencias docentes. Esta idea contrasta con el papel que la Universidad de Deusto reserva para el facilitador, que, desde una óptica menos intervencionista, es más acorde con Bakkenes, Vermunt y Wubbels (2010), que apuntan la importancia del rol del facilitador como animador para que los docentes compartan experiencias e inquietudes y avancen así hacia una mayor cohesión entre ellos.

4. Factores de éxito de los equipos de mejora

Son muchos los factores que pueden considerarse clave para el éxito de un equipo, si bien pueden agruparse en procedimentales, contextuales y relacionales. Entre los procedimentales los autores destacan, en primer lugar, la identificación conjunta del problema a resolver (Karlsen y Larrea, 2015) y, tras este, fijar los estándares de trabajo y diseñar el propio plan (Fabela-Cárdenas y García-Treviño, 2014). El profesorado del programa coincide en señalar como más importantes estos dos factores, si bien en orden contrario, concediendo más relevancia al segundo (4,4) que al primero (4,3).

En cuanto a los factores contextuales, los autores hablan de dos: el espacio de comunicación y el tiempo, ya que es necesario crear un contexto comunicativo adecuado para facilitar la colaboración (Karlsen y Larrea, 2015) y cuidar que el tiempo dedicado también sea el suficiente y de calidad, para que sea posible la reflexión compartida, creación y convivencia (Gómez *et al.,* 2014). En los equipos de ambas ediciones, no obstante, no se destaca ninguno de estos factores como de influencia en el éxito.

Por último, los factores relacionales, como la estabilidad o motivación, a que hacen referencia autores como Gómez *et al.* (2014), han sido muy bien valorados por todos los profesores, con puntuaciones de entre 4,1 a 4,4. Las preguntas relacionadas con la compartición de experiencias son los que mayor índice de factor de éxito presentan.

5. Conclusiones

El objetivo del estudio presentado ha sido el contraste entre la experiencia vivida por el profesorado novel de la Universidad de Deusto en equipos para la mejora de la docencia y lo que señala la literatura al respecto. Se puede concluir que los resultados obtenidos se alinean

con lo apuntado por los principales autores, si bien afloran diferencias posiblemente relacionadas con la singularidad de la cultura institucional.

Las principales ventajas percibidas por el profesorado participante están relacionadas con la oportunidad que generan de reflexión compartida sobre la práctica docente. A nivel institucional se podría decir que la extensión de esta forma de proceder redundaría en un hábito de evaluación cuyas fuentes fundamentales serían los propios compañeros y el mismo profesor. La dinámica de generar y recibir el feedback mutuo contribuye a fomentar la capacidad de reflexión y pensamiento crítico que requiere el aprendizaje continuo por parte de la organización. Además, en la medida que este proceso mejora las relaciones entre compañeros, sin duda permite avanzar hacia el clima de confianza que facilita el desarrollo de las potencialidades de los equipos.

Se constata la relevancia del rol de las facilitadoras como animadoras del proceso de reflexión. Su trabajo paralelo en un equipo de mejora de facilitadoras ha repercutido positivamente en el devenir de los equipos de profesorado novel.

Por último, atendiendo al propio equipo de mejora, contar con un buen plan de trabajo e identificar conjuntamente el objeto de mejora son considerados los principales factores de éxito. En esta relación quedan postergados como factores de éxito el espacio físico utilizado, que puede no destacar por no haber supuesto un elemento distorsionador, a modo de factor tipo higiénico de Herzberg (1974). Caso contrario sería el factor tiempo que, curiosamente, aun siendo considerado la mayor desventaja, en la realidad no ha supuesto obstáculo para que los equipos consiguieran su objetivo, probablemente por la presencia de factores realmente motivacionales (Herzberg, 1974). Y es que la satisfacción generalizada del profesorado con su equipo, con el intercambio de experiencias, con conocer cómo los iguales abordan los retos y dificultades, el estar satisfecho con la propia aportación al equipo… ha supuesto tal factor de motivación que ha provocado que el inconveniente del tiempo y agenda se disipen hasta prácticamente su no consideración.

El nuevo espacio de aprendizaje continuo generado en torno a los equipos de mejora tiene por eje la reflexión, el análisis y la mejora de la propia práctica docente. Y el clima de colaboración y confianza que se ha generado ha constituido el contexto que lo ha posibilitado.

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Incorporación de la metodología de escritura a través del currículo: diagnóstico del proceso de enseñanza-aprendizaje para desarrollar habilidades en comunicación escrita y determinar los géneros discursivos de los textos académicos en la carrera de Enfermería

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Resumen

Introducción: La escritura tiene gran importancia en el desarrollo de las personas. Permite transformar e incrementar el conocimiento, además de favorecer el desarrollo del pensamiento crítico, la resolución de problemas, y la comunicación de pensamientos, experiencias y sentimientos. Sin embargo, la adquisición de esta habilidad es un proceso largo y complejo. Objetivos: Realizar el diagnóstico del proceso de enseñanza-aprendizaje para desarrollar habilidades en comunicación escrita en español y determinar los géneros discursivos de los textos académicos en estudiantes de Enfermería Metodología: El presente estudio corresponde a una iniciativa multimétodo que incluye levantamiento y análisis de datos cuantitativos y cualitativos. La fase cuantitativa es de tipo descriptivo transversal. Se aplicó encuesta semiestructurada a 261 estudiantes. Los datos fueron analizados utilizando tablas de frecuencia y contingencia, mediante el software STATAv.14. La fase cualitativa correspondió a un análisis de 174 informes escritos. Resultados: 64% de los estudiantes afirma no tener formación en la competencia de comunicación escrita. En el análisis cualitativo fueron identificados cuatro géneros discursivos: entrevista, trabajos cuantitativos de revisión bibliográfica, tesis y artículo científico. Discusión: Si bien existe consenso en que la escritura es una habilidad primordial a desarrollar, dicha habilidad está condicionada por la capacidad de éste para hacer suya la necesidad de su desarrollo, y, asimismo, identificar las falencias a mejorar. Conclusión: Los estudiantes necesitan aprender a escribir adecuadamente, por medio de experiencias activas que estimulen su participación.

Palabras clave: escritura a través del currículum, Estudiantes enfermería.

Abstract

Background: Writing has great importance in the development of people. Allows to transform and increase knowledge, also helps the development of critical thinking, problem resolutions, and comunication of thoughts, experiences and feelings. However, the acquisition of this skill is a long and complex process. Objectives: To do a diagnosis of the teaching-learning process to develop skills in written communication in spanish and determine the discursive genders of academic texts in undergraduate Nursing students. Methodology: This research corresponds to a multimethod study that includes the collection and analysis of quantitative and qualitative data. The quantitative phase was a transversal descriptive design. Semi-structured survey was applied to 261 students. The data was analyzed using frequency and contingency tables, using the software STATAv.14. The qualitative phase corresponded to analysis of 174 written reports, of diferents levels of the career Results: 64% of the students affirm that they have no training in written communication. In the qualitative analysis, four discursive genders were identified: interview, quantitative works of bibliographic revision, thesis and scientific article. Discussion: Although there is a consensus that writing is a fundamental skill to be developed ineach person. This ability is conditioned by the ability of each person to make the need of its development his own, and, also, to identify the shortcomings to be improved. Conclusion: Students need to learn how to write properly, through active experiences that stimulate their participation.

1. Antecedentes

La Universidad del Desarrollo (UDD) ha definido en su Proyecto Educativo 2015 ciertas competencias genéricas que otorgan un sello distintivo a sus profesionales. Entre éstas se encuentra la comunicación, por lo tanto, cada unidad académica debe procurar la adquisición de dicha competencia entre sus estudiantes (1).

Existe consenso en Chile que los estudiantes universitarios presentan un déficit importante en la comunicación escrita. La adquisición de la habilidad para escribir requiere de un desarrollo constante que comienza en la etapa escolar y debe continuar fortaleciéndose en la educación superior (2-4). Con el fin de dar respuesta a esta necesidad, surge el movimiento Writing Across the Curriculum, en español Escritura a través del currículo (EAC). Este movimiento considera la escritura como una herramienta de enseñanza-aprendizaje. Se fundamenta en que los estudiantes mejoran las habilidades de escritura cuando se sienten comprometidos con la temática, es decir, cuando escriben sobre los temas de su propia disciplina (3,5).

Las distintas universidades que han promovido en su currículo esta herramienta pedagógica, concuerdan que los docentes no sólo deben transmitir sus conceptos, sino que también deben enseñar sus prácticas de lectura y escritura, para lo cual es fundamental que tanto cada carrera como disciplina, sea capaz de identificar sus propias particularidades (5, 6). Por lo tanto, es fundamental tener claro que cada disciplina posee géneros discursivos académicos que lo identifican (7).

A partir de lo expuesto, surge la motivación en la carrera de Enfermería UDD de dar respuesta a los siguientes objetivos: realizar el diagnóstico del proceso de enseñanza-aprendizaje para desarrollar las habilidades en comunicación escrita en español y determinar los géneros discursivos de los textos académicos en estudiantes de Enfermería.

2. Método

El presente estudio corresponde a una iniciativa multi-método que incluye levantamiento y análisis de datos cuantitativos y cualitativos. La fase cuantitativa es de tipo descriptivo transversal. Se aplicó encuesta semiestructurada a 261 estudiantes. Los datos fueron analizados utilizando tablas de frecuencia y contingencia, mediante el software STATAv.14. La fase cualitativa correspondió a un análisis de 174 informes escritos, en diferentes niveles de la carrera desde 1ero a 5to año. A todos los participantes se les solicitó la firma de consentimiento informado y se cautelaron los Principios Éticos de Emanuel. Los datos fueron analizados mediante programa computacional Excel.

3. Resultados

Un 64% de los estudiantes afirma no tener formación en la competencia de comunicación escrita. Dentro de aquellos que indicaron tener formación (35%) (Tabla 1), especificaron que obtuvieron dicha formación en colegio y talleres dentro de la Universidad.

Tabla 1
Porcentaje de alumnos que afirma tener formación en la competencia de comunicación escrita en español

¿Tiene usted formación en la competencia de comunicación escrita?	%
No	63,6%
Si	34,2%
No responde	2,1%

En el análisis cualitativo de 174 informes escritos realizados por estudiantes de la carrera de Enfermería, de primer a quinto año del Plan de Estudios. Se identificaron cuatro géneros discursivos: entrevista, trabajos cuantitativos de revisión bibliográfica, tesis y artículo científico (Tabla 2).

Tabla 2
Características de los géneros discursivos identificados

	Entrevista	Trabajos cuantitativos de revisión bibliográfica	Artículo científico	Tesis
Registro	Familiar	Altamente Formal	Altamente formal	Altamente formal
Nivel Técnico	Escasamente técnico	Medianamente técnico	Altamente técnico	Altamente técnico
Tipo textual	Entrevista	Revisión bibliográfica cuantitativa	Artículo Científico	Tesis de grado
Propósitos	Informar	Informar		Informar, Argumentar
Audiencias	Profesional y académica en formación de pregrado	Académicas y profesional	Profesional y Académica	Profesional y Académica
Estructura	Introducción, preguntas y respuestas, conclusión, autoevaluación y bibliografía.	Introducción, Marco Teórico, Preguntas de Investigación, Objetivos, Referencias, Flujograma, Tabla de Búsqueda.	Resumen, Introducción, Marco Teórico, Pregunta de Investigación, Objetivos, Diseño Metodológico, Presentación y Análisis de Resultados, Discusión de Resultados, Conclusiones, Referencias Bibliográficas, Anexos.	Resumen, Introducción, Marco Teórico, Pregunta de Investigación, Objetivos, Diseño Metodológico, Presentación y Análisis de Resultados, Discusión de Resultados, Conclusiones, Referencias Bibliográficas, Anexos.

4. Discusión

Si bien existe consenso en que la escritura es una habilidad primordial a desarrollar en el individuo, dicha habilidad está condicionada por la capacidad de éste para hacer suya la necesidad de su desarrollo, y, asimismo, identificar las falencias a mejorar. Si el estudiante confía demasiado en su capacidad para escribir de una forma correcta, difícilmente sentirá la necesidad de capacitarse para perfeccionar este saber. Es necesario explicitar e intencionar la escritura en la universidad, lo cual mejorará los textos escritos, su desempeño y aprendizajes.

5. Conclusión

Los estudiantes necesitan aprender a escribir adecuadamente, por medio de experiencias activas que estimulen su participación, ya que la escritura es el medio por el cual construirán conocimiento disciplinar a lo largo de su formación de pregrado.

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Student-teachers' perceptions of a proposal to develop their identities as inquirers

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Abstract

This study reports on students' perceptions of inquiry activities conducted during their first practicum in primary teacher education. Encouraging student-teachers to meet the challenge of becoming inquiring practitioners requires integrating research activities and practice into teacher education. Thus, teacher educational programmes should be designed and redesigned with a focus on a research-based approach if they are to successfully encourage teachers to use research in their professional practice. The practicum studied here was designed based on educational design research principals in order to promote the construction of student-teachers' identities as inquirers. The proposal was carried out during the first practicum period of a Spanish teacher education programme (second year). Students spent 120 hours at a school over a semester and attended four hours a week of university sessions where a tutor guided the practicum. The practicum was divided into thirteen distinct activities or pedagogically meaningful situations, distributed into three phases: analysis-exploration, design-construction, and evaluation-reflection.

The study was guided by two research questions: 1. How did students assess inquiry activities? 2. What were the student-teachers' perceptions of the barriers and the facilitators they found when carrying out the inquiry activities?

Twenty-seven student-teachers participated in the study through individual written self-reports.

The results show that the students assessed the overall didactic proposal positively. The activities carried out at the school or in collaboration with the university were rated the highest. In addition, the students reported feeling that inquiry was difficult and that they were not sufficiently prepared to conduct it well. Finally, considering the facilitators and barriers identified by the students, ideas for improving the proposal in the future are provided.

1. Introduction

To encourage teachers to use research in their professional practice, teacher training programmes should be designed and redesigned to focus on a research-based approach (RBA) (Alvunger & Wahlström, 2017).

There is surprisingly little research in Spain on the research-based approach (RBA) to teacher education, although this approach has aroused great international interest.

Relevant contributions (Leat, Reid & Lofthouse, 2015) have highlighted the need to understand how students perceive research during and after their participation in a research-based programme.

Becoming and training an inquiring practitioner is a challenge for student-teachers. To help them face this challenge, a true research orientation in teacher education must incorporate supervised practice in pedagogically significant situations (Krokfors, 2007).

We designed a student-teacher education programme taking into account the characteristics mentioned above, in order to promote student-teachers' development as inquiring practitioners.

The study was guided by the following research questions:

1. How do students assess inquiry activities?
2. What are the student-teachers' perceptions of the barriers and the facilitators in a practicum based on inquiry activities?

2. Method

The program was carried out during Practicum I, the first practices of the Spanish teacher training program (second year and 120 hours in a specific classroom school). The training sessions at the university were distributed in three phases inspired by McKenney & Reeves (2012): analysis and exploration of context, design and construction of research-based educational practice, and evaluation and reflection on practice. The proposal resulted in the design of thirteen pedagogically significant situations distributed among the three phases.

The sample was twenty-seven student-volunteer teachers, 23 women and 4 men, with an average age of 21.5 years participated in the study.

The instrument used was a self-report written along the practicum, with two different parts. The first one asked the students to rate each activity in relation to six factors (usefulness, meaning, learning, satisfaction, ease and happiness) on a Likert scale (1-5). On the second one, the students explained the barriers and facilitators for each activity.

The data were analysed using both quantitative and qualitative methods; descriptive statistics for the self-report (Likert scale) and inductive analysis of content categorization for open questions, reaching a 90% agreement, discussing the few questionable cases until a consensus was reached.

3. Results

3.1. How do students assess inquiry activities?

The overall learning proposal received a high score (M = 4.04). The highest scores were: Making sense (M = 4.52), Usefulness (M = 4.44), Learning (M = 4.11) and Satisfaction (M = 4.07); and the lowest Ease (M = 3.56) and Happiness (M = 3.74).

The three learning tasks with the highest scores were *3. Design of an interview* (M = 4.56), *11. Design an evidence-based intervention* (M = 4.44), and *12. Develop the intervention in the classroom* (M = 4.67).

And the three learning tasks with lower scores were: *4. Search in the scientific literature* (M = 3.11), *9. Search in the scientific literature* (M = 3.59), and *10. Individual academic reading* (M = 3.67).

3.2. What are the student-teachers' perceptions of the barriers and the facilitators in a practicum based on inquiry activities?

The activities of the Phase were perceived as useful for: a) generating questions as future teachers; b) promoting reflection on complex issues; c) acquiring knowledge and finding and selecting information; d) defining the focus of the intervention; e) sharing doubts about the context of the intervention; f) structuring and organizing ideas; g) addressing problems in the real context; h) increasing knowledge about the classroom; and i) identifying problem areas for improvement in the intervention.

The perceived barriers in this Phase were: a) lack of prior knowledge necessary to understand academic readings; b) difficulties in synthesizing and understanding information; and c) how to adjust data collection instruments (interviews and observation tools) for use in the classroom.

Phase 2 activities were found useful for: a) showing research databases and the importance of the research question; b) discovering authors with different points of view; c) concretizing the research issue through writing; d) sharing the problem with classmates; and f) concretizing the intervention proposal.

In terms of barriers, difficulties were reported in a) specifying selection criteria for articles; b) understanding information; c) transferring scientific knowledge to concrete proposals; d) developing a clear, accurate and feasible research question; and e) managing the classroom during the intervention.

And the evaluation of the activity in Phase 3 facilitated a) the identification of the planning and intervention elements that had worked and those that had not; b) the feeling that they would be able to replicate the positive results and modify the elements that had not worked in future interventions; and c) the opportunity to share what they had learned with others.

4. Conclusions

The interest of this work consists in the design of a comprehensive educational proposal for the teacher for the training of teachers who request it in the context of a teaching practice.

The overall results indicate that the proposal achieved its main learning objectives. Although students perceived the proposal as challenging in certain respects, it made sense to them and they found it useful, and reported that they had a deeper understanding of the research.

In the assessment of the activities, the results have shown that the student-teachers successfully understood the educational process. Interaction with others was a good supporting activity and was valued by the students (Wagsas & Spernes, 2018). The barriers were related to the key skills required for each activity, e.g. the search for and selection of appropriate articles and the understanding of information.

The limitations of the study are the sample —only 27 students— and the fact that it is the first practice for them.

Finally, according to our results, it would be interesting to design a longitudinal study to understand how student-teachers develop their perceptions of self-efficacy and their attitude towards inquiry during initial training and what kind of support facilitates their development.

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How University Teacher Training Plans can Help Implement and Develop the Scholarship of Teaching and Learning

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Abstract

The objective of this communication is a preliminary study on the current status of the training plans for university lecturers in Spain regarding the Scholarship of Teaching and Learning (SoTL). The aim of the present work is a reflection on how to implement and improve the Scholarship of Teaching and Learning Process in university teacher training plans.

The focus of this work is to make those responsible for the current university lecturer training plans aware of how they can improve the training so that they are closer to the research approaches in the academic field on the teaching-learning process.

Improving the process of learning and teaching in higher education means contributing to the increase in the knowledge of relevant and significant learning aspects. Currently, this represents an important challenge in the reform process in which the universities belonging to the European Higher Education Area (EHEA) are involved.

Implementing, updating, improving or developing university teacher training plans is a challenge for Spanish and other European universities alike, with a view to respond to the requests of the European Higher Education Area (EHEA) and to jump-start European convergence in the field of education.

Keywords: Pedagogical training teachers, higher education, professional development, university pedagogy, competencies, Scholarship of Teaching and Learning.

1. State of the Art

The Bologna process and the creation of a European Higher Education Area (EHEA) have determined several changes in the university setting, among which:

- the transformation of the design and development of the university education with the introduction of competency-based trainings
- the renewal of methodology and evaluation systems
- the introduction of quality assurance systems in higher education institutions
- new teaching careers have been established on the basis of the successive accreditation system for contract teachers (R.D. 1052/2002)
- the sexennium of Knowledge Transfer and Innovation (Spain being the first country to create an evaluation model of this type), the 2018 change has the two following objectives:

  1. the recognition of the teaching and research staff's excellence and their effort in their role of assuming the responsibility of this transfer as a substantial part of their scientific task
  2. to increase the transfer, innovation and dissemination of knowledge to enterprises and into society as a whole.

Article 89.5 of the LOMLOU establishes that "...universities will promote the implementation of programs aimed at the methodological renewal of university education for the fulfillment of the quality objectives from the European Higher Education Area".

The ENQA Report on Criteria and Guidelines for Quality Assurance in the European Higher Education Area undertaken by Spain also includes criteria to guarantee teaching staff quality, indicating that institutions must ensure that teaching staff are qualified and competent to carry out their work; "opportunities must be given to teaching staff in order to develop and expand their teaching capacity". In this way, it is fundamental to create opportunities to allow teacher reflexion, going beyond the fulfillment of their obligations.

2. General

The Scholarship of Teaching and Learning (SoTL) is based on the reciprocal relationship between teaching and learning at university level (Boyer, 1990).

The SoTL approach invites teachers to examine their work and practice, directly in the classroom with students, recording successes and failures in order to share their experiences with other professionals that can reflect and use them and develop teaching and learning processes. SoTL serves to disseminate the results of research and to make the implementation of theories and educational practices related to teaching and learning accessible (Hutchings and Shulman, 1999).

Hutchings and Shulman (1999) also explain that in SoTL, teachers must systematically investigate questions related to student learning. The purpose is to go further than a single course, program or institution - to advance in the field of teaching and learning, developing deep knowledge and continuous improvement. Its ultimate goal is the understanding and improvement of student learning and teaching practice through disciplinary and interdisciplinary peer review and public dissemination.

A teacher, nowadays, in addition to being responsible for students' learning of an academic discipline, must also help students to acquire and develop personal competences. In this context, talking about SoTL means recognizing the importance and priority of the subject of "teaching and learning" in the university by studying the problem through:

— appropriate methods for different discipline epistemologies
— putting results into practice
— communicating the obtained results
— self-reflecting and peer reviewing.

The guidelines established by the EHEA suggest that young people who finish their degree not only have "knowledge" as before, but also "competences". The acquisition of these competences has required a complete overhaul of the entire teaching and learning process. All this is not enough, we also need to see what the "competences" are that need to be developed by the teachers. For this reason we need to rethink current teacher training.

University professors carry out their professionalism according to four main task guidelines:

— teaching
— investigation
— management responsibilities
— knowledge transfer.

In this investigation we focus only on the teaching aspect of these guidelines, whilst also taking into account the fact that the other three tasks take up a lot of university teachers' time and energy.

It's true that universities provide 360º training in teacher training plans, but what is relevant to this work is the part that refers to the actual teaching role.

3. Research

3.1. Research Questions

— To which extent do university teacher training plans contribute to generating this academic approach to teaching and learning?
— To which extent are training plans designed to advance professional development to improve these processes from a research point of view?
— To what extent is the research on the teaching and learning process developed in university?
— What would university teacher training programs have to offer for teaching to not just be a "teaching process" but more of a "research process" focused on the teaching-learning process?

3.2. Research Objectives

— To reflect on the Scholarship of Teaching and Learning (SoTL).
— To locate and detect the experience of what is currently in the training plans for Spanish universities teachers.
— To propose some action lines so that the integration of the teaching and learning academic approach begins to be known and disseminated in Spain as it is today in English-speaking countries.
— To promote concrete actions so that scientific communities and teachers who work in Higher Education educational innovation feel committed, so that they can look for new points of contact and exchange with other teachers in order to improve their professionalism.
— To specify some measures to improve training plans so that they are closer to the investigation perspective of SoT.

3.3. Methodology

This paper is part of a broader investigation on the analysis of University Teacher Training at a European wide level in which different models and structures of university teacher training are analysed and compared.

3.3.1. *Population and sample*

Selection and size:

— Country choice: Spain.
— All Spanish universities: among which we have chosen public ones.
— Among public universities: teacher training plans sourced through the Internet were analysed.

We have used Universia as a database, which is the university network reference for Ibero-America consisting of 1,341 universities. The following filters in the search have been applied (date of consultation: March 2019):

— Type of institution: UNIVERSITY: 83.
— Character of the institution: PUBLIC: 50-PRIVATE: 29.
— Types of studies offered: ALL.
— Autonomous Communities: 17.
— Provinces: 33.

The sample size consists of 50 Spanish public universities (we have decided to investigate teacher training plans from public universities) using information obtained by consulting public information available on the universities' websites.

3.3.2. *Content analysis process*

Analysis criteria:

1. Is there any updated (2018-2019) plan on the university website?
2. Is there any training activity related to the principles or methodology related with SoTL?

The following table shows the results of the research by summarising the answers to the above written questions in the last two columns.

Table 1
Teacher Training plans and SoTL approach

Autonomous Community	Provinces	University	N	Training Plan 18-19	SoTL
Comunidad de Madrid	Madrid	Universidad Complutense de Madrid	1	YES	Y/N
		Universidad Autónoma de Madrid	2	YES	NO
		Universidad Politécnica de Madrid	3	YES	NO
		Universidad Carlos III de Madrid	4	YES	NO#
		Universidad Rey Juan Carlos	5	NO	NO
		Universidad de Alcal	6	YES	NO
		Universidad Nacional de Educación a Distancia	7	NO	NO
		Universidad Internacional Menéndez Pelayo	8	NO	NO
Andalucía	Almería	Universidad de Almería	9	YES	NO
	Cádiz	Universidad de Cádiz	10	YES	NO
	Córdoba	Universidad de Córdoba	11	YES	NO
	Granada	Universidad de Granada	12	YES	Y/N
	Huelva	Universidad de Huelva	13	YES	Y/N
	Jaén	Universidad de Jaén	14	NO	NO
	Málaga	Universidad de Málaga	15	YES	NO
	Sevilla	Universidad de Sevilla	16	YES	NO
		Universidad Pablo de Olavide de Sevilla	17	YES	NO
		Universidad Internacional de Andalucía	18	YES	NO
Cataluña	Barcelona	Universitat Autònoma de Barcelona	19	YES	Y/N
		Universidad de Barcelona	20	YES	Y/N
		Universidad Politécnica de Catalunya Barcelona	21	YES	NO
		Universitat Pompeu Fabra	22	YES	Y/N
	Gerona	Universitat de Giron	23	YES	NO
	Lleida	Universidad de Lleida	24	NO	NO
	Tarragona	Universitat Rovira i Virgil	25	NO	NO
Comunidad Valenciana	Alicante	Universidad Miguel Hernández de Elche	26	YES	NO
		Universidad de Alicante	27	YES	NO
	Castellón	Universidad Jaume I de Castellón	28	YES	NO
	Valencia	Universitat de València	29	YES	NO
		Universitat Politècnica de València	30	YES	NO
Castilla y Leon	Burgos	Universidad de Burgos	31	YES	NO
	León	Universidad de Leó	32	YES	NO
	Salamanca	Universidad de Salamanca	33	YES	NO
	Valladolid	Universidad de Valladolid	34	YES	NO

Autonomous Community	Provinces	University	N	Training Plan 18-19	SoTL
Galicia	A Coruña	Universidad de Santiago de Compostela	35	YES	NO
		Universidad da Coruña	36	YES	NO
	Pontevedra	Universidad de Vigo	37	YES	NO
Isla Canarias	Las Palmas	Universidad de Las Palmas de Gran Canaria	38	YES	NO
	Sta. Cruz de Tenerife	Universidad de La Laguna	39	YES	NO
Región de Murcia	Murcia	Universidad de Murcia	40	YES	NO
		Universidad Politécnica de Cartagena	41	YES	NO
Aragon	Zaragoza	Universidad de Zaragoza*	42	YES/G9*	Y/N
P. de Asturias	Asturias	Universidad de Oviedo*	43	YES/G9*	NO
C. de Navarra	Navarra	Universidad Pública de Navarra*	44	NO/G9*	NO
País Vasco	Vizcaya	Universidad del País Vasco*	45	NO/G9*	NO
Extremadura	Badajoz	Universidad de Extramadura*	46	YES/G9*	NO
Cantabria	Cantabria	Universidad de Cantabria*	47	YES/G9*	NO
Castilla-La Mancha	Ciudad Real	Universidad de Castilla-La Mancha*	48	YES/G9*	NO#
Islas Baleares	Islas Baleares	Universitat de les Illes Baleares*	49	NO/G9*	NO
La Rioja	La Rioja	Universidad de La Rioja*	50	YES/G9*	NO#
Total = 17	Total = 33	Total = 50	50	YES = 41 NO = 9	YES = 0 NO = 40 NO# = 2 Y/N = 8

* These universities belong to Group 9, an association formed of Spanish public universities whose common objective is to promote collaboration among university institutions belonging to the Group - both in terms of teaching and research activities. This is done by: i) favouring the exchange of teaching staff ii) stimulating student mobility, iii) developing training courses and iv) creating joint chairs exchanging information on academic and teaching matters.

NO# refers to the special cases listed below:

1. if there is a training plan but it is not publicly accessible
2. if the approach exists in the general programme but the details of the single courses cannot be found on the web page.

Y/N refers to the special cases listed below:

1. if the approach is present in the general program of the training plan but is not implemented in the courses
2. if the approach is present in the methodology of a single course training plan, even if it is not explicitly mentioned.

4. Results and Proposals

The analysis carried out on Spanish teachers' university training plans has shown that the SoTL approach is not so disseminated in Spain, as it is in English-speaking countries. It has been noted that some universities (16%) present although there is a slight use of the SoTl approach in the general part of their teacher training plans; this approach is not reflected by the actions that they offer in their practice for teacher training (courses, seminars, etc.).

Here in this paper, based on our findings, we would like to propose an increase in the dissemination of SoTL in Spanish-speaking countries; in such a way that it can be as

widespread as it is in English-speaking countries. To do this we propose the following lines of action.

1. To implement, through the State University Teaching Network (Red Estatal de Docencia Universitaria-RED-U) (https://red-u.org/), "study days", similar to the ones started in Jaén (Spain) in November 2018 (https: //jornadas2018.red-u.org/programa/)
2. To consolidate proposals of international congresses such as EuroSoTL in Bilbao 2019, propelling an international collaboration with the European group of the International Society for Scholarship of Teaching and Learning —ISSOTL— and the RED-U.
3. To design new teacher training plans to introduce into their SoTL proposals. It is important that research methodology in social sciences and the scholarship of teaching and learning are included (for example, contents in relation to methods of collecting and analysing information in education or dissemination and scientific publication). The objective is to update university lecturers about research methodologies in educational areas so that they can make use of this methodology by carrying out "teaching-learning" research processes in their subject and in their specific area.
4. To know the scientific sources of the dissemination of teaching-learning research for specific subjects. For example, in JCR there is an area called "Category Profile" where you can find a specific category "EDUCATION, SCIENTIFIC DISCIPLINES" where more than 40 journals appear with an impact factor (it is true that most of them are from Medicine or Engineering and Education). In Spain, for example, journals such as the RED-U Magazine that would serve as a vehicle for disseminating research in specific areas, or also, more specifically, the UB's Law and Education Journal (Revista de Derecho y Educación de la UB), etc. .
5. To propose educational innovation projects that favor their evaluation and a possible investigation of the results.
6. As academic structures, to help the propagation of this SoTL approach, in Spain we find the emerging Research Institutes of Education, following the IUCE model of the University of Salamanca characterized by its interdisciplinary nature (see, iuce.usal.es).

If the SoTL begins to be known and spread in the scientific communities and among the teachers who work in the educational innovation of Spanish Higher Education could favour a more committed feeling among teachers to encourage them to look for points of contact and exchange between them. These good teaching practices can then come "out of the closet" (https: //jornadas2018.red-u.org/programa/) and be recognised at a public and institutional level.

Starting from the analysis of these training plans that assuming only a partial and not explicit address of the SoTL topics in Spanish universities; one possible proposal for future work would be to study which aspects could be improved and what are the missing competencies that could be included in the existing plans so that the university professors can manage and be confident with a SoTL approach.

5. Conclusions

In this historical period of European (and therefore including Spanish) universities, it is important to reflect on the state of the art of university teacher training. From the Bologna

Plan onwards, a lot of work has been done and efforts have been made by universities, even if there is still a lot of work to do in this direction. As a result of this, it is important to know what different European universities are doing in terms of teacher training. Starting with a particular focus on a preliminary review, of the teacher training plans of Spanish universities.

A university lecturer can be innovative in their teaching but they remain a professional in their discipline, due to their specialised training they do not dominate research in the educational field (teaching and learning).

The SoTL approach introduces the possibility for the teaching to be public, shared and peer-reviewed in accordance with a cooperative evaluation process to create a "virtuous circle" and improve the teaching and learning process. To achieve all this, it is necessary to implement training strategies in line with the SoTL principle.

The proposal of this work is to develop these skills among university professors in Spain, taking into consideration the fact that there is a considerable difference between a simple innovation in teaching and an academic approach in the teaching and learning process (SoTL). The SoTL research methodologies can represent the possibility to really understand if a student's learning is deep, relevant and meaningful.

Updating, improving and developing university teacher training plans is something that will be challenging for all European and Spanish universities in order to respond to the requests of the EHEA and to put a real "education convergence process" of Europe in motion.

Improving the process of learning and teaching in higher education means contributing to increase knowledge about learning and this represents the current and important challenge in the reform process in which the universities that belong to the EHEA are involved.

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La observación de pares entre profesores universitarios: ¿cuál es su valor educativo?

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Resumen

La Especialización en Docencia Universitaria (EDU) del Instituto Universitario del Hospital Italiano (IUHI) contempla dentro de su propuesta formativa un dispositivo de observaciones de clases entre pares que se inscribe en el módulo de Práctica Docente Supervisada (PDS). Comprende un taller inicial sobre observación, las observaciones de clases, la realización de un informe por parte de quien observa y un encuentro posterior de devolución hacia el observado que es mediado por una docente de la EDU.

Este dispositivo forma parte de una propuesta que apunta a sostener la reflexión sobre la propia práctica de enseñanza (Schon, 1992; Edelstein, 2011; Perrenoud, 2004) para analizarla a la luz de conceptos pedagógicos que permitan repensarla, distanciarse y generar alternativas (Brockbank y McGill, 2002; Carr, 1990). El acto de observar puede constituir una herramienta poderosa para la reflexión en y sobre la acción docente y tiene un valor fundamental para el desarrollo de profesionales reflexivos (Anijovich, 2009).

¿Qué valor tiene observar para los docentes? ¿Qué aprenden los observadores?

Realizamos un estudio cualitativo descriptivo-interpretativo en el que analizamos 41 informes de observación realizados por alumnos/as de las cohortes 2017-2018, enfocándonos en las preguntas de uno de sus apartados cuyo propósito es estimular la reflexión sobre la práctica.

A partir de la lectura de este apartado construimos categorías que conforman dos grupos. Por un lado, aparecen valoraciones de los observadores hacia sus pares y sobre la clase. Por otro, encontramos valoraciones hacia la experiencia de ser observador en tanto les permite identificarse, reflejarse, transferir alguna idea concreta a su práctica. En un caso, el dispositivo permite afinar la mirada sobre las prácticas docentes, construyendo un análisis desde categorías pedagógicas. En el otro, trasciende esta acción y vuelve hacia el observador generando una mirada crítica, reflexiva y transformadora sobre sí.

Este dispositivo permite ejercer una práctica docente reflexiva en tanto posibilita que los profesionales en formación hagan conscientes sus repertorios de acción mediante la reconstrucción conceptual y la reestructuración de sus modos de representación, comprensión y actuación, en instancias de reflexión y construcción conjunta con docentes y compañeros (Roni *et al.,* 2013).

Abstract

In the context of a two year teacher training programme, there is a module thathas the purpose of supervising the teaching practices carried out by these professionals in training. For this module, a peer observation device was created. The device consists of an initial workshop with guidelines, the observation of a peer's class, a written report made by the observer and a feedback meeting mediated by a teacher of the programme.

Observation can be a powerful tool for reflecting in and on action and it has a central value in the development of reflective professionals (Anijovich, 2009). The peer observation device aims to promote teacher's reflection on their practice (Schon, 1992; Edelstein, 2011; Perrenoud, 2004), stimulating an analysis with pedagogical concepts, a distancing to rethink the practice and the possibility of designing alternatives (Brockbank and McGill, 2002; Carr, 1990).

This study centers on the educational value of observation for teachers in training. What do they learn when observing peers teach? Through a qualitative descriptive-interpretative approach, we analyse41 observation reports written by teachers in training during 2017-2018. The analysis focuses on a segment of the reports assigned to the reflection on the observation activity.

From this analysis, two groups of categories were created. One group refers to teacher's estimations of their peers and the class observed. The other group refers to estimations towards the experience of being observers and how it allows them to identify themselves, see themselves reflected or transfer ideas to their own practice. In the first case, observation enables teachers to refine their vision on teaching practices by analysing them with pedagogical concepts. In the second case, reflection goes beyond this first level of analysis allowing the observer to gain a critical, reflexive view which promotes a transformation of their teaching practice.

As a result, this device enables teachers in training to make conscious their action repertoires through a conceptual reconstruction and a restructuration of their representations, comprehensions and actions (Roni, Eder, Schwartzman, 2013). Achieving, through a joint reflection and construction process with teachers and peers, the development of reflective teaching practices.

1. Introducción

Los profesionales de la salud que deciden formarse como docentes suelen ejercer ya esta actividad de forma secundaria a su tarea asistencial sin mucha planificación ni revisión crítica de sus prácticas. En este sentido, tomar como objeto de reflexión aquello que éstos ya saben y hacen es un puntapié inicial para las propuestas de formación docente.

¿Cómo promover una mirada crítica acerca de sus modos de hacer y ser docentes? ¿cómo acompañar sus prácticas reales para que puedan ser revisadas y tomadas como objeto de reflexión? La formación de docentes universitarios en servicio deberá generar situaciones de aprendizaje que reconozcan la cotidianeidad como fuente primaria para cuestionar concepciones y hacer conscientes los propios repertorios de acción, a través de instrumentos conceptuales de análisis (Roni *et al.,* 2013).

Una estrategia posible es la realización de observaciones de clases entre pares, es decir entre los mismos docentes que cursan la formación. Observar es un proceso que puede constituirse en una oportunidad privilegiada para reflexionar sobre la acción (Schön,1992, Ornique y Sabelli, 2014), en tanto contribuye a afinar la mirada sobre las prácticas docentes (propias y de terceros) con categorías pedagógicas.

Esta observación precisa 3 instancias: preparación, desarrollo y análisis posterior (Anijovich *et al.,* 2009), requiere atención voluntaria y selectiva en función del objetivo y algún instrumento para recoger información sobre la situación observada (De Ketele, 1984 en Anijovich *et al.,* 2009). Mirar las prácticas docentes con la intención de comprenderlas y aprender de éstas, a través de las categorías pedagógicas puestas en juego, supone interpretar situaciones particulares como casos de un fenómeno más amplio (Orland-Barak y Leshem, 2009). También implica visibilizar los marcos de interpretación que dan sentido a lo observado (Ornique y Sabelli, 2014).

En este trabajo se analizan los informes de observación de docentes a sus pares, para comprender en qué medida este proceso puede ser formativo, no sólo para los docentes observados sino también para quienes desempeñan el rol del observador. A partir del análisis de los informes que redactan en forma posterior nos proponemos comprender: ¿Qué valor tiene para los observadores ir a mirar las clases de otros docentes? ¿Qué aprenden en este proceso?

2. Metodología y contexto

Este estudio fue realizado en un Instituto Universitario de la Ciudad de Buenos Aires (Argentina) orientado al campo de la salud en los niveles de grado, posgrado y de especiali-

zaciones en servicio a través del sistema de residencias hospitalarias. En este contexto, la Especialización en Docencia Universitaria para profesionales de la salud (en adelante, EDU) contempla un dispositivo de observaciones de clases entre pares que permite abordar reflexivamente las prácticas reales ejercidas por los docentes en formación que cursan este posgrado. Los participantes de la EDU ofrecen dos clases que ya dictan para ser observadas por sus compañeros. Así, todos ejercen ambos roles: observar y ser observados. Las clases pueden situarse en cualquiera de las propuestas educativas desarrolladas en el Instituto Universitario y en diferentes contextos o ámbitos de práctica (hospitalario, universitario, comunidad, sociedades científicas).

El dispositivo de observación entre pares se desarrolla en cuatro etapas:

1. Asistencia a un *taller sobre observación*, en el que se trabaja sobre el sentido de observar, el rol del observador no participante, el instrumento de observación, la construcción del informe y feedback al colega.
2. *Observación de clase* de un compañero/a de formación con una guía de observación estructurada que enfoca: la modalidad de clase, secuencia de actividades, relación contenido-estrategias de enseñanza, relación docente-alumno, entre otros.
3. Elaboración de *informe de devolución* por parte del observador. Este incluye datos contextuales de la clase, interpretación de lo sucedido, conclusiones (fortalezas, oportunidades de mejora y sugerencias para acciones futuras), y reflexión para la propia práctica.
4. *Encuentro de devolución entre pares*, donde el observador comparte su mirada respecto de aspectos valiosos de la clase observada, cuestiones a revisar y sugerencias de mejora. Este espacio es coordinado por una docente de la EDU.

Para el presente estudio, analizamos a través de un proceso de codificación (Maxwell, 2008), 41 informes (etapa 3) realizados por participantes de las cohortes 2017-2018 de la EDU. El propósito de reconocer qué valor tiene observar para los docentes en formación, qué aprenden y, fundamentalmente, en qué radica la potencia de este dispositivo. Para ello, nos enfocamos en el apartado final de cada informe que solicita a los observadores responder las siguientes preguntas que apunta a estimular la reflexión sobre la práctica: ¿Qué aprendiste de tu colega?, ¿Qué te resultó interesante o sorpresivo?, ¿Cómo podéis usar la perspectiva de tu colega en tu propia actividad docente?

3. Resultados

A partir del análisis de 41 informes, encontramos tendencias centrales que agrupamos en dos tipos de valoraciones que los docentes realizan: aquellas que enfocan *la clase observada* y *las que se centran en la experiencia de observar*.

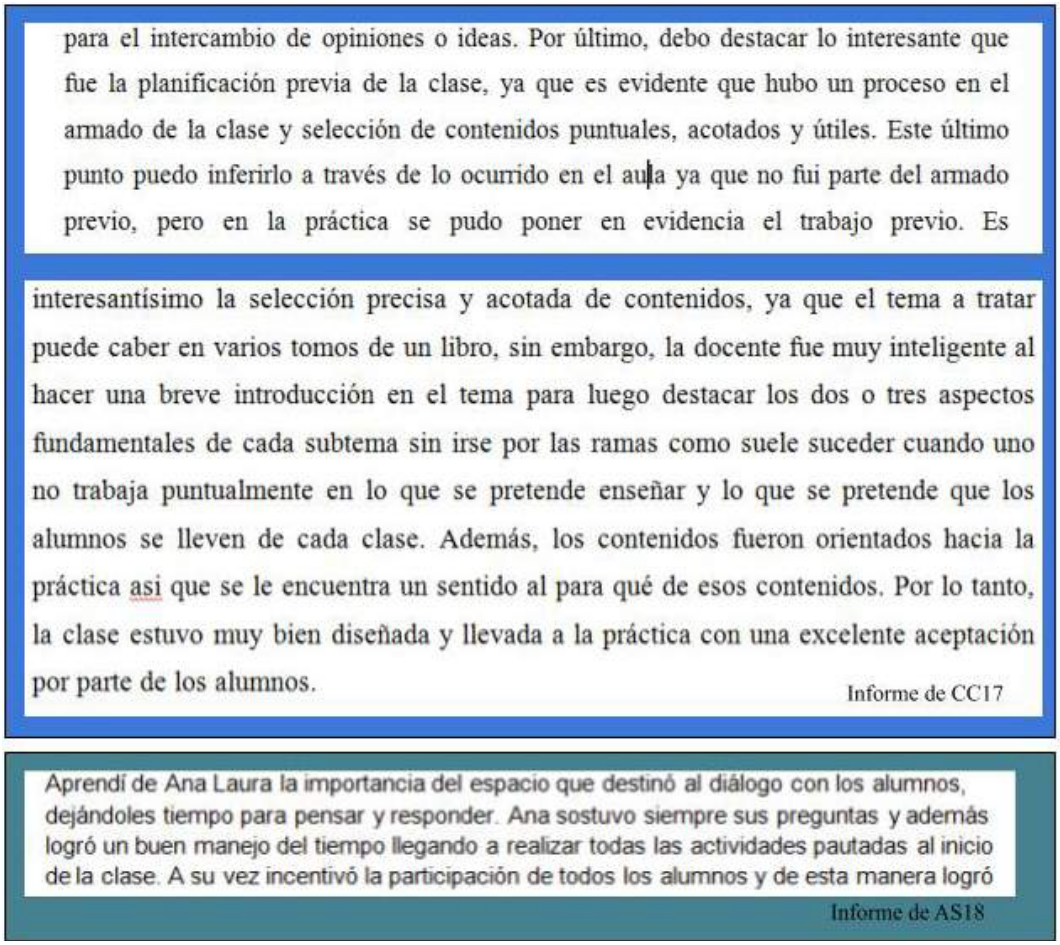
3.1. Valoraciones sobre las clases observadas

Este tipo de valoraciones refiere a aspectos que los observadores identifican como características destacables en la construcción de una situación educativa. Encontramos cuestiones vinculadas a la planificación, explicitación de objetivos de aprendizaje, actividades propuestas a los estudiantes, manejo de las interacciones en plenario. Estas apreciaciones las realizan, generalmente, desde marcos conceptuales pedagógicos, lo que nos permite reconocer la construcción de conocimientos didácticos a partir de casos concretos.

A continuación presentaremos algunos fragmentos de los informes que ilustran el modo en que los observadores abordan estos aspectos.

La mayoría de los docentes refiere a la importancia de la planificación de la clase (15 menciones):

Figura 1
Fragmentos de informes sobre planificación de clases



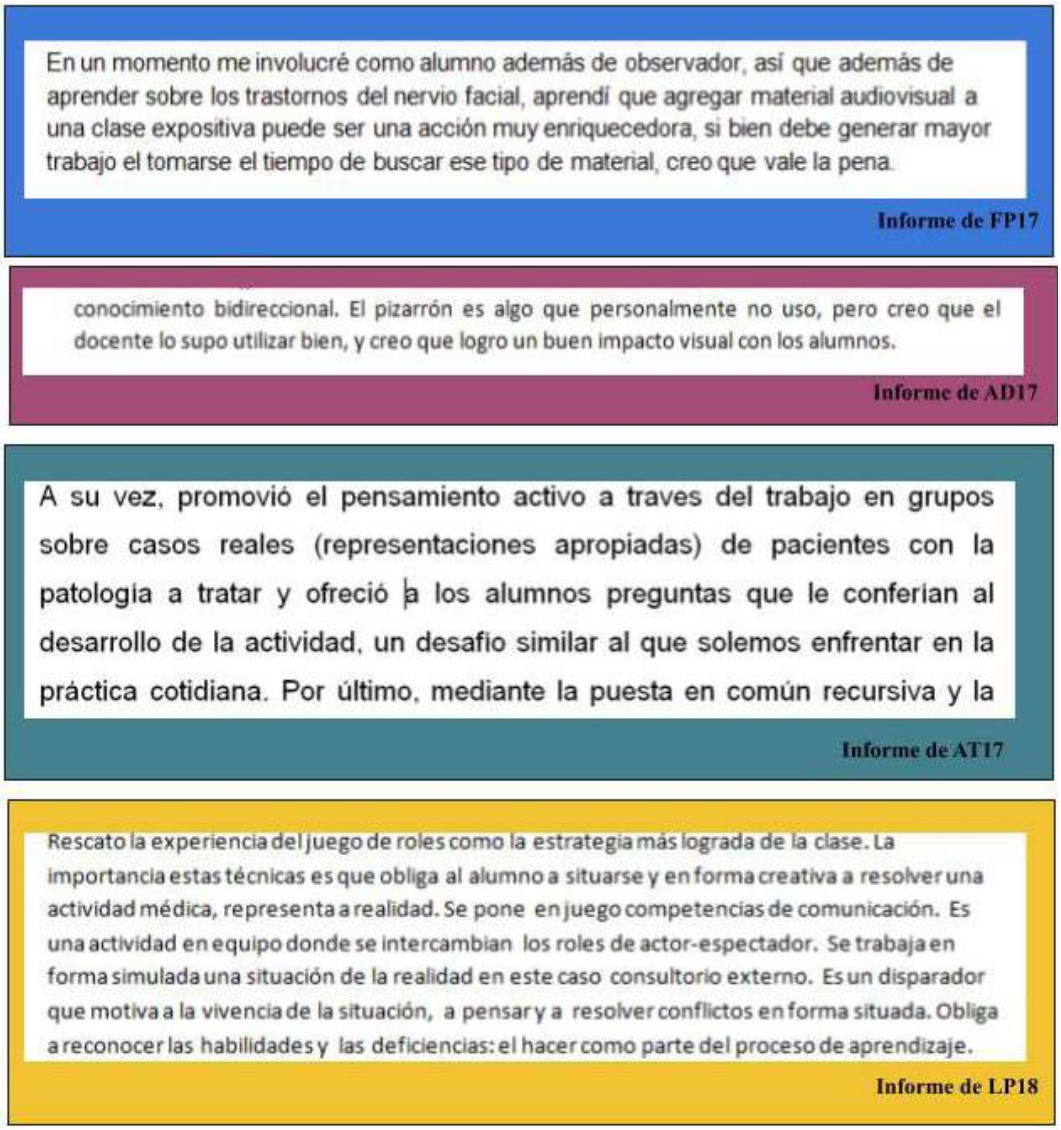
Tal como se muestra en la *Fig.1*, los docentes ponen en valor *la planificación de las clases* traducida en la administración del tiempo, selección de contenidos, momentos y actividades previstas.

En segundo lugar, encontramos que destacan *actividades de aprendizaje* observadas en las clases de sus pares (14 menciones), entre las que mencionan mayormente el uso de casos. En tercer lugar, aprecian *los recursos* (11 menciones), como el uso del pizarrón o del material audiovisual. Ejemplificamos en la *Fig. 2*:

La *Fig. 2* ilustra cómo los observadores destacan la pertinencia de incluir ciertos recursos como el *material audiovisual* o *pizarrón* para promover los aprendizajes de sus estudiantes. También identifican el valor de incluir actividades tales como el *trabajo en grupos*, el *uso de casos* y el *juego de rol* como propuestas adecuadas al contenido a desarrollar.

Figura 2

Fragmentos de informes sobre actividades en clases

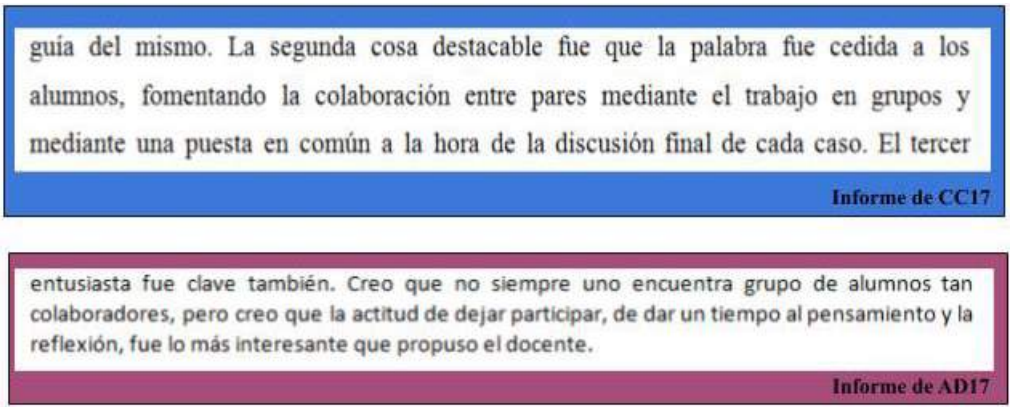


Como cuarta tendencia, identificamos que destacan el *manejo de las interacciones* de los estudiantes en el aula (11 menciones), tal como se ilustra en la *Fig 3*:

En la *Fig. 3*, los docentes reconocen la importancia de fomentar la interacción entre estudiantes y dar tiempo para que ocurra, en lugar de otorgar una respuesta inmediata o solo exponer información. Esto evidencia cómo encuentran maneras para favorecer el diálogo en las aulas y dar espacio al pensamiento y la reflexión.

Figura 3

Fragmentos de informes sobre manejo de las interacciones entre estudiantes

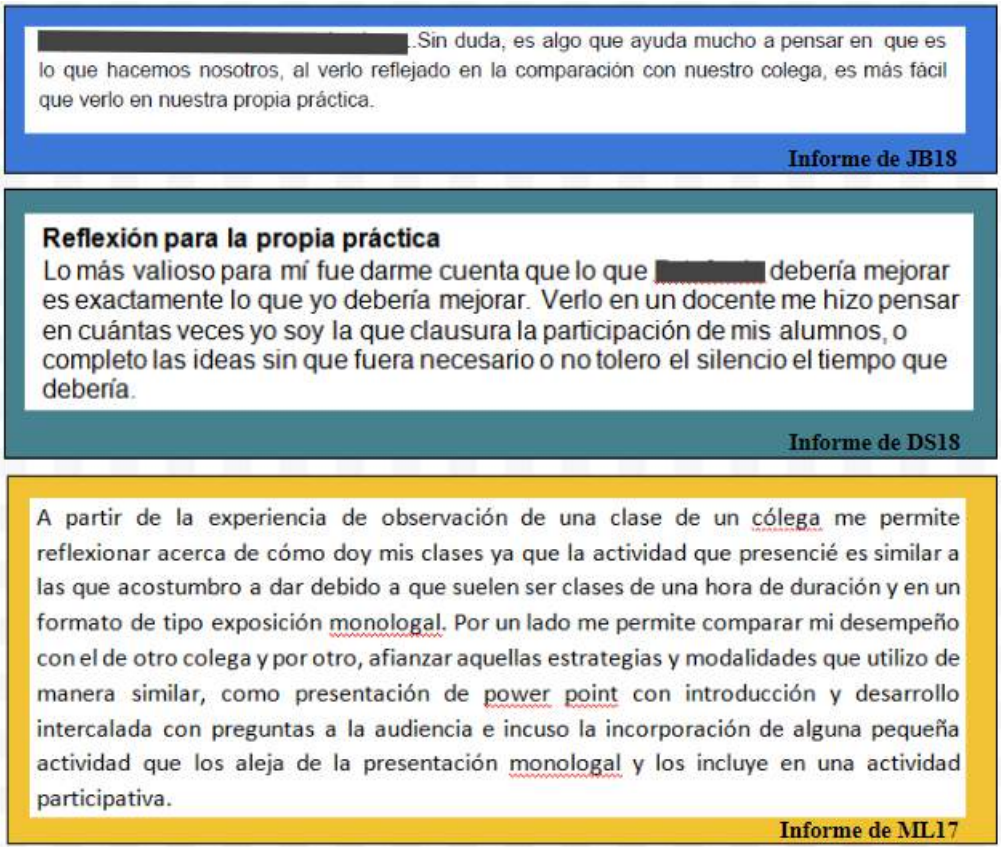


3.2. Valoraciones sobre la experiencia de observar

En este segundo grupo, encontramos que los docentes valoran el dispositivo en tanto les permite pensar sobre su propia tarea al reflexionar sobre las de sus compañeros. Ejemplificaremos con algunos fragmentos textuales:

Figura 4

Fragmentos de informes sobre el valor del dispositivo



La *Fig. 4* muestra la reflexión que los docentes realizan sobre aquello que el dispositivo de observación entre pares les permite en términos de su propia profesionalización en docencia universitaria. Identifican en la actividad docente de sus pares modos de hacer que podrían ensayar e incluir en sus propios repertorios de actuación en futuras prácticas.

4. Conclusiones

A partir de lo expuesto, consideramos que este dispositivo en su totalidad —preparación, observación, construcción del informe escrito y encuentro de devolución— constituye una tarea de aprendizaje que posibilita a los docentes en formación reflexionar críticamente sobre su tarea a través del análisis didáctico. La implementación de una propuesta que otorgue un rol central a la observación de prácticas reales ejercidas, y que permita tomar las situaciones como objeto de análisis compartido entre pares docentes en formación, puede considerarse como un dispositivo para ejercer una *práctica profesional reflexiva* (en publicaciones previas lo hemos denominado *dispositivo para jugar el juego completo de la docencia* Cfr. Schwartzman *et al.,* 2014). Permiten encontrar problemas o identificar logros, con especial atención en las áreas de incertidumbre y controversia del quehacer docente, con la intención de cuestionar concepciones y hacer conscientes los propios repertorios de acción, a través de instrumentos conceptuales de análisis. Los docentes de ciencias de la salud en formación reconocieron la planificación de la clase, el uso de variadas actividades de aprendizaje y de recursos didácticos para pensar la enseñanza en sus aulas. Además, valoraron el impacto que tuvo observar a pares para repensar sus propias acciones.

Este trabajo resulta entonces un aporte para comprender qué contenidos promover en la reflexión sobre la acción docente, cuáles son las necesidades formativas que identifican los profesores, así como los modos de llevar adelante experiencias de aprendizaje basadas en la profesionalización de la tarea docente universitaria.

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Visual Thinking para la mejora del aprendizaje en Ciencias de la Salud

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Resumen

La seguridad del paciente es un eje central para Enfermería y un elemento transversal a lo largo del Grado. Por ello, el cálculo de dosificación se considera un factor clave. En las reuniones de coordinación del grupo de innovación docente, se detectaron dificultades en el desarrollo del proceso cognitivo del cálculo de dosis, que se repetían en otras asignaturas en las que se realizan cálculos matemáticos. Por eso, se vio la necesidad de introducir metodologías que facilitaran ese aprendizaje, comenzando con una asignatura básica de 1.er curso y 1er cuatrimestre, Sistemas de Información y análisis de datos, en la se trabajan estos elementos cognitivos (deductivos e inductivos).

Revisadas las metodologías más adecuadas, se optó por utilizar Visual Thinking (VT), dado que el aprendizaje visual refuerza los primeros pasos del aprendizaje de la Taxonomía de Bloom, por lo que en el curso 2018/19 se introduce dicha metodología.

Objetivo: analizar si la utilización de VT mejora los resultados de aprendizaje en la asignatura Sistemas de Información y análisis de datos.

Metodología: La población diana fueron dos cohortes de 116 y 122 alumnas/os (87,1% y 91% de mujeres) correspondientes al alumnado de primer curso de los cursos académicos 2017/18 y 2018/19, diferenciados en dos líneas idiomáticas (euskera y castellano), de características muy heterogéneas respecto al tamaño del grupo, edad y vía de acceso.

Se analizan dos tipos ejercicios (deductivos e inductivos) realizados en sesiones diferentes durante los cursos 2017/18 y 2018/19, utilizando la prueba estadística no paramétrica U de Mann-Whitney para comparar los resultados de los dos cursos.

Resultados: Si bien los resultados obtenidos no demostraron una clara mejoría en la primera sesión de cada tipo de ejercicio (aunque significativo en el grupo idiomático más grande $p < 0,001$), en la segunda sesión se comprobó un incremento de 0,46 y 0,70 puntos en las calificaciones de los componentes deductivo e inductivo respectivamente ($p < 0,001$).

Conclusiones: La utilización de Visual Thinking ha producido una mejora significativa del aprendizaje relacionado con los cálculos matemáticos. No obstante, hay que continuar investigando para ratificar esos resultados.

Abstract

Patient safety is the essence of Nursing and a transversal element throughout the Degree. Therefore, the dosage calculation is considered a key factor. In coordination meetings of the teaching innovation group, issues were detected in the development of the cognitive process of dose calculation, which repeated in other subjects in which mathematical calculations are performed. Therefore, we found necessary to introduce methodologies to facilitate this learning, starting off with a basic subject in 1st year and 1st semester, Information Systems and data analysis, in which these cognitive elements (deductive and inductive) are worked with .

Once having the most appropriate methodologies checked out, it was decided the use of Visual Thinking (VT), since visual learning reinforces the first steps of learning Bloom's Taxonomy, so in the 2018/19 course that methodology was introduced.

Objective: to analyze if the use of VT improves the learning results in the subject of Information Systems and data analysis.

Methodology: The target population were two cohorts of 116 and 122 students (87,1% and 91% of women) regarding the first-year students of the academic courses 2017/18 and 2018/19, differentiated

into two language lines (Basque and Spanish), with very heterogeneous characteristics regarding group size, age and access route.

Two types of exercises (deductive and inductive) are analyzed, performed in different sessions during the 2017/18 and 2018/19 courses, using the Mann-Whitney nonparametric U-test to compare the results of both courses.

Results: Although the results obtained did not show a clear improvement in the first session of each type of exercise (even though significant in the larger language group $p < 0.001$), in the second session an increase of 0,46 and 0,70 points was found in the grades of the deductive and inductive components respectively ($p < 0,001$).

Conclusions: The use of Visual Thinking has produced a significant improvement in learning related to mathematical calculations. However, we must continue to investigate to ratify these results.

1. Introducción

En el Grado en Enfermería la seguridad del paciente es un eje central y transversal. El cálculo de dosificación se considera un factor clave para la seguridad del paciente. En las reuniones de coordinación del Grado en Enfermería de la Sección Donostia/San Sebastián de la Facultad de Medicina y Enfermería del País Vasco (UPV/EHU), se detectaron dificultades en el cálculo de dosis, que se repetían en otras asignaturas en las que se realizan cálculos matemáticos.

Para facilitar el proceso de aprendizaje, se consideró que era necesario introducir cambios metodológicos, comenzando con una asignatura básica de primer curso y primer cuatrimestre, Sistemas de Información y análisis de datos, en la se trabajan estos elementos cognitivos (deductivos vinculados a la estadística descriptiva e inductivos a la estadística inferencial).

Realizada una revisión bibliográfica para determinar qué metodologías podían ser más adecuadas para el caso, se optó por utilizar Visual Thinking (VT) [1-4], dado que el aprendizaje visual refuerza los primeros pasos del aprendizaje de la Taxonomía de Bloom [5-7].

2. Objetivo

Analizar si la utilización de Visual Thinking mejora los resultados de aprendizaje en la asignatura Sistemas de Información y análisis de datos.

3. Metodología

La población diana fueron dos cohortes de primer curso de los cursos académicos 2017/18 y 2018/19, de 116 y 122 alumnas/os (87,1% y 91% de mujeres), diferenciados en dos líneas idiomáticas (euskera y castellano).

En el curso 2018/19 se comienza a utilizar Visual Thinking para reforzar los primeros pasos del aprendizaje de la taxonomía de Bloom. En las clases magistrales elaboran mapas visuales en un modelo de aprendizaje colaborativo dentro del aula, reforzado con gamificación utilizando las plataformas Kahoot® y Quizizz®.

Se analizaron los resultados de 2 tipos de ejercicios, que tienen carácter evaluativo y se realizan en dos momentos diferentes. Los ejercicios de estadística descriptiva, que se realizan

en primer lugar, tienen un componente deductivo, con una resolución más mecánica. Los de estadística inferencial, tienen naturaleza inductiva, que exigen cumplir los primeros pasos de la taxonomía de Bloom para su resolución. El primer ejercicio de cada tipo se realiza siguiendo el cronograma previsto para la asignatura y el segundo de ambos tipos el último día de ese cuatrimestre (diciembre).

Para el análisis estadístico de los resultados de los dos cursos, se utiliza la prueba no paramétrica U de Mann-Whitney (nivel de significancia $p < 0,05$).

4. Resultados

Las características de los grupos estudiados respecto al tamaño del grupo, edad, vía de acceso y la nota media de acceso en el cupo general se muestran en la Tabla 1. Dicho alumnado supuso el 87,6% del alumnado que accede al grado de Enfermería. El resto del alumnado accede al grado por otras vías (Mayores de 25 años: Mayores de 45 años; Mayores de 40 años y experiencia laboral; Discapacidad; Deportistas de élite)

Tabla 1
Características de los grupos del estudio

	n	Edad	Mujeres	Acceso por el cupo general	Nota media acceso cupo general
2017/18	116	19,14 [*18,41-19,86*]	87,10%	91,4%	11,008 [*10,82-11,19*]
2018/19	122	19,73 [*18,82-20,65*]	91,00%	93,5%	11,248 [*11,05-11,44*]
2017/18 euskera	82	18,24 [*17,95-18,54*]	89,00%	96,3%	11,264 [*10,89-11,26*]
2017/18 castellano	34	21,88 [*19,30-24,47*]	82,40%	70,6%	11,076 [*10,89-11,26*]
2018/19 euskera	93	18,52 [*18,29-18,74*]	94,60%	97,8%	11,523 [*11,41-11,64*]
2018/19 castellano	29	25,34 [*21,32-29,37*]	79,30%	75,9%	11,257 [*11,08-11,43*]

Atendiendo a la homogeneidad de los grupos analizados (Tabla 2), en ningún caso hay diferencia respecto al sexo y la forma de acceso. Si analizamos la edad, medida en años cumplidos, en todos los casos se produce una diferencia estadísticamente significativa. Sin embargo, la diferencia de las medias de edad entre los dos cursos analizados es inferior a 1 año (2017/18: 19,31 años [18,49-20,13]; 2018/19: 20,14 años [19,07-21,20]). Entre los grupos de euskera, la diferencia de la media entre los grupos es inferior a medio año. Los grupos de castellano, más pequeños y mucho más heterogéneos por recoger la mayoría de casos de acceso al grado en enfermería por otras vías, presentan diferencias más importantes con respecto a los grupos de euskera y entre los propios grupos de castellano.

Respecto a la nota media de acceso del cupo general, aunque la diferencia es inferior a medio punto, el resultado es estadísticamente significativo.

Tabla 2
Análisis de las diferencias entre los grupos del estudio

Grupos analizados	Edad	Sexo	Forma de acceso	Nota media acceso cupo general
	U de Mann-Whitney	*Chi cuadrado*	*Chi cuadrado*	*U de Mann-Whitney*
2017/18 vs 2018/19	p = 0,010	p = 0,333	p = 0,166	p < 0,001
2017/18 euskera vs 2018/19 euskera	p = 0,030	p = 0,173	p = 0,150	p = 0,002
2017/18 castellano vs 2018/19 castellano	p = 0,097	p = 0,759	p = 0,092	p = 0,112

La media de las calificaciones de los ejercicios realizados, en función del curso, línea idiomática y sexo se recogen en la tabla 3. Es destacable la mejora que se produce en el grupo de euskera y el peor resultado que se produce en el primer ejercicio de cada tipo en el grupo de castellano.

Tabla 3
Calificación media obtenida por cada grupo en las diferentes pruebas realizadas

	Estadística descriptiva	Estadística descriptiva. *Diciembre*	Estadística inferencial	Estadística inferencial. *Diciembre*
2017/18	6,22 [*5,57-6,88*]	7,71 [*7,45-7,97*]	5,16 [*4,45-5,87*]	6,95 [*6,54-7,37*]
2018/19	6,10 [*5,33-6,86*]	8,17 [*7,82-8,53*]	5,64 [*4,97-6,31*]	7,65 [*7,34-7,95*]
2017/18 euskera	6,07[*5,29-6,85*]	7,51 [*7,17-7,85*]	4,91 [*4,02-5,79*]	6,98 [*6,47-7,48*]
2018/19 euskera	7,35 [*6,61-8,10*]	8,41 [*8,04-8,78*]	6,43 [*5,72-7,13*]	7,91 [*7,62-8,20*]
2017/18 castellano	6,58 [*5,31-7,87*]	8,18 [*7,86-8,49*]	5,76 [*4,57-6,95*]	6,89 [*6,11-7,68*]
2018/19 castellano	2,07 [*0,64-3,50*]	7,39 [*6,56-8,22*]	3,11 [*1,69-4,52*]	6,80 [*5,95-7,66*]
2017/18 mujeres	6,17 [*5,46-6,88*]	7,37 [*7,48-7,98*]	4,94 [*4,17-5,71*]	6,91 [*6,47-7,35*]
2018/19 mujeres	6,31 [*5,52-7,10*]	8,19 [*7,48-8,57*]	5,79 [*5,09-6,49*]	7,65 [*7,33-7,99*]
2017/18 hombres	6,60 [*4,67-8,53*]	7,53 [*6,30-8,77*]	6,61 [*4,72-8,50*]	7,26 [*5,81-8,71*]
2018/19 hombres	4,00 [*0,86-7,14*]	7,95 [*7,10-8,80*]	4,11 [*1,37-6,85*]	7,56 [*6,71-8,41*]
Acceso Cupo Gral.2017/18	6.16 [*5,47-6,85*]	7,63 [*7,34-7,91*]	5,08 [*4,33-5,84*]	7,01[*6,59-7,42*]
Acceso Cupo Gral.2018/19	6,36 [*5,58-7,14*]	8,34 [*8,03-8,66*]	5,85 [*5,16-6,54*]	7,82 [*7,56-8,10*]
Otros accesos 2017/18	6,69 [*4,36-9,02*]	8,31 [*7,74-8,89*]	5,71 [*3,37-8,05*]	6,52[*4,55-8,49*]
Otros accesos 2018/19	2,78 [*0,43-5,99*]	5,98 [*3,33-8,62*]	2,92 [*0,12-5,73*]	5,40 [*3,09-7,71*]

Analizando globalmente los datos de los dos cursos (Tabla 4), en el primer ejercicio hubo una disminución y aumento en los ejercicios deductivo e inductivo respectivamente, éste no fue significativo. Sin embargo, en los ejercicios de diciembre la mejora es significativa en am-

bos casos. Según el idioma, en el grupo de euskera se aprecia una mejora estadísticamente significativa en todos los casos. Por el contrario, en el grupo de castellano los resultados obtenidos en los primeros ejercicios fueron peores, mejorando el resultado en los ejercicios de diciembre. A nivel global, no hubo un aumento significativo de las calificaciones con respecto al curso anterior

Tabla 4
Análisis de las calificaciones obtenidas en los cursos 2017/18 y 2018/19
(U de Mann-Whitney)

	Estadística descriptiva	Estadística descriptiva. *Diciembre*	Estadística inferencial	Estadística inferencial. *Diciembre*
2017/18 vs 2018/19	p = 0,037	p < 0,001	p = 0,267	p = 0,001
2017/18 euskera vs 2018/19 euskera	p < 0,001	p < 0,001	p = 0,017	p < 0,001
2017/18 castellano vs 2018/19 castellano	p < 0,001	p = 0,090	p = 0,006	p = 0,928
2017/18 mujeres vs 2018/19 mujeres	p < 0,001	p < 0,001	p = 0,001	p = 0,001
2017/18 hombres vs 2018/19 hombres	p = 0,638	p = 0,864	p = 0,337	p = 0,380
Acceso Cupo Gral.2017/18 VS Acceso Cupo Gral.2018/19	p = 0,005	p < 0,001	p = 0,095	p < 0,001
Otros acceos.2017/18 VS Otros accesos2018/19	p = 0,043	p = 0,071	p = 0,110	p = 0,357

En cuanto al sexo, las calificaciones obtenidas por las mujeres mejoraron mientras que en los hombres los resultados fueron inferiores en el primer ejercicio, homogeneizándose los resultados en diciembre. Sin embargo, no se pudo demostrar diferencia estadística entre hombres y mujeres.

Además, quienes acceden al grado a través del cupo general presentan una mejora significativa. Por el contrario, quienes acceden por otras vías en 2018/19 obtuvieron resultados inferiores en el primer ejercicio, homogeneizándose los resultados en diciembre. En este caso existe una diferencia estadísticamente significativa en todos los ejercicios entre el alumnado que accede a través del cupo general y el que accede por otros cupos.

5. Discusión

Aunque los dos grupos no son completamente homogéneos, presentan diferencias en la edad y en la nota de acceso. Los grupos más heterogéneos son los grupos de castellano, que normalmente recogen a todo el alumnado que accede al grado por otras vías.

Si bien en el primer ejercicio no existió una mejoría en las calificaciones, las calificaciones obtenidas en el segundo ejercicio presentaron una mejoría estadísticamente significativa. En el grupo mayoritario y más homogéneo (euskera) existió una mejora significativa, con una valoración positiva de la utilización de VT. Probablemente, dicha mejoría viene dada por una mayor experiencia de este grupo con herramientas educativas similares.

Sin embargo, en el grupo de castellano, más heterogéneo, en los primeros ejercicios hay un claro retroceso en la calificación. Dichos resultados pudieran deberse en parte a la resistencia inicial demostrada por este grupo prueba, de lo cual se cita el comentario realizado

por integrantes del mismo: "*Al comienzo los mapas me parecieron una tontería y ahora, al mirarlos, me parecen de mucha ayuda*".

Los hombres presentan peores resultados que las mujeres, sin que dicha diferencia sea estadísticamente significativa. Asimismo, resultados similares se han obtenido con el alumnado que accede a la universidad por otras vías (mayores de 25 años, de 40 años…) presentes en su mayor parte en el grupo de castellano. Todo ello hace que este grupo por diferencia de edad y metodologías educativas previamente utilizadas, tenga mayores dificultades iniciales con la metodología "Visual Thinking", que se van solventando a medida que se van integrando en la misma.

6. Conclusiones

La utilización de Visual Thinking ha producido una mejora significativa del aprendizaje relacionado con los cálculos matemáticos vinculados a la bioestadística, tanto en los que tenían un componente predominantemente deductivo, como en los que eran de tipo inductivo.

La aparición de resistencia a la introducción de una nueva metodología como VT, plantea la existencia de un factor actitudinal clave, que será necesario abordar desde el primer momento para facilitar su implantación.

No obstante, es necesario continuar investigando para ratificar si VT permite mejorar los resultados de aprendizaje en esta materia.

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Análisis retrospectivo sobre la influencia del Método del Caso en la percepción del alumnado de Enfermería Geriátrica

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Resumen

Introducción: El Método del Caso (MdC) es una metodología educativa que permite al estudiante desarrollar las habilidades necesarias para responder ante situaciones de cuidado complejas. El objetivo de este artículo es describir la percepción de los estudiantes a lo largo de 5 años de experiencia en la implementación del MdC en la asignatura de Enfermería Geriátrica en la Escuela de Enfermería de Vitoria-Gasteiz (España).

Métodos: La planificación, diseño e implementación del MdC se realizó en base a las cuatro fases del programa ERAGIN. Los datos de satisfacción del alumnado fueron recogidos mediante la encuesta diseñada por la Universidad del País Vasco para dicho programa.

Resultados: El alumnado valora que el MdC ayuda a establecer relaciones entre teoría y práctica, analizar situaciones de la práctica profesional y tomar decisiones. La mayoría de los estudiantes repetiría MdC en un futuro.

Reflexiones: El MdC se ha establecido como metodología docente sostenida en el tiempo y exitosa en la asignatura de Enfermería Geriátrica que favorece la implicación del alumnado a juzgar por las valoraciones positivas del alumnado.

Abstract

Introduction: The Case Method (CM) is a teaching method which allows students to develop necessary skills to respond to future complex healthcare situations. The aim of this short paper is to describe the student perception throughout the 5 year experience after implementing CM within the Geriatric Nursing Course in the Nursing School of Vitoria-Gasteiz (Spain).

Method: The planning, designing and implementing of CM followed the four-phase approach of the ERAGIN programme. Student satisfaction data was collected using the questionnaire which had been specifically designed for that programme by the University of the Basque Country.

Results: Students feel that CM helps them establish a relation between theory and practice, analyse clinical situations and make decisions. Most students would choose to do CM again in the future.

Reflections: CM has been successfully established in the Geriatric Nursing course and it encourages the implication of students based on the positive feedback received.

1.. Introducción

La Comisión Europea alerta de que la carencia de competencias básicas y transversales de muchos graduados son una realidad. Por ello, esta institución insiste en que el sistema de educación superior necesita dar respuesta a la demanda de profesionales altamente cualificados puesto que las capacidades de pensamiento crítico, comunicación y adaptación a contextos que cambian rápidamente son ahora más importantes que nunca (1).

Ante las exigencias de calidad identificadas por las instituciones europeas, la Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU) optó por la promoción de metodologías activas a través del programa ERAGIN, entre otras, el Método del Caso (MdC), el cual constituye una metodología de alta calidad en docencia (2). El MdC permite al alumnado enfrentarse a situaciones de la vida real en el aula, promoviendo el análisis de situaciones, la aportación de soluciones y favoreciendo la toma de decisiones situándose desde la perspectiva del profesional además de mejorar las habilidades de pensamiento crítico (3,4). Estas habilidades son necesarias para el desarrollo del rol de la enfermera ante futuras situaciones de cuidado complejo (5).

El objetivo de este artículo es presentar los resultados de la encuesta de satisfacción del alumnado respecto al MdC de los últimos 5 cursos académicos en la asignatura de Enfermería Geriátrica en el Grado de Enfermería de la Escuela Universitaria de Vitoria-Gasteiz (España).

2. Metodología

La planificación y el diseño de la asignatura Enfermería Geriátrica integrando el MdC se realizó durante el programa ERAGIN durante el curso 2014-15. Los materiales didácticos, las actividades de aprendizaje y los instrumentos de evaluación se validaron tras la experiencia piloto del 2015. Tras evaluar la implementación del MdC se realizó la propuesta definitiva y se publicó el centro de recursos IKD baliabideak (https://addi.ehu.es/handle/10810/17760).

A partir del curso 2014-15, el MdC se ha integrado en el currículum de la asignatura Enfermería Geriátrica y tras cada implementación se han recogido de manera sistemática encuestas de satisfacción del alumnado. Por lo que se dispone de datos de los últimos 5 cursos académicos (2014/15, 2015/16, 2016/17, 2017/18 y 2018/19).

Para la recogida de los datos sobre la percepción del alumnado sobre el MdC concretamente se ha empleado el cuestionario de opinión diseñado por la UPV/EHU para el programa ERAGIN. En este estudio se presentan los resultados relativos a 2 apartados de dicho cuestionario:

— Valoración del grado de ayuda de la metodología: 14 ítems con escala tipo Likert (1 = muy poco; 2 = poco; 3 = bastante; 4 = mucho).
— Opinión acerca de optar por esta metodología en el futuro: dos categorías (sí/no).

Los datos fueron analizados mediante estadística descriptiva (porcentajes, medias y medias ponderadas). La máxima puntuación de cada ítem en la tabla 2 es 4.

3. Resultados

En relación con los resultados de los últimos 5 cursos académicos, cabe comentar que en total 203 estudiantes han realizado el MdC en la asignatura de Enfermería Geriátrica. De todos ellos, 185 completaron el cuestionario ERAGIN (tasa de respuesta 91,1%). Las características sociodemográficas de las muestras de estudiantes se muestran en la Tabla 1.

Como es de esperar por el Grado del que se trata, el porcentaje de mujeres en muy alto. Este hecho no difiere de otras Universidades. La edad media del alumnado también corresponde con el año académico en el que se imparte la asignatura de Enfermería Geriátrica (2.º curso).

Tabla 1

Características sociodemográficas de las muestras de estudiantes

	Curso académico				
	14/15	**15/16**	**16/17**	**17/18**	**18/19**
Muestra de estudiantes (n)	27	41	33	40	44
Mujeres (%)	85,2	90,2	90,9	90,0	84,1
Edad media	20,2	19,6	19,8	19,9	19,7

Los resultados de la valoración del grado de ayuda del MdC (expresados en medias ponderadas) y la opinión acerca de optar por esta metodología en un futuro se muestran en la Tabla 2. Las áreas de valoración media más altas de los estudiantes han sido "Establecer relaciones entre teoría y práctica", "Analizar situaciones de la práctica profesional" y "Tomar decisiones en torno a una situación real". Por el contrario, el área de valoración media más baja ha sido "Indagar por tu cuenta en torno al trabajo planteado". Además, la mayoría de los estudiantes de cada curso optarían por repetir MdC en un futuro.

Tabla 2

Resultados de la encuesta ERAGIN de satisfacción del alumnado con la metodología

Valora en qué medida consideras que la metodología empleada te ha ayudado a:	**Curso académico**					**Media**
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	
Comprender contenidos teóricos	3,1	3,1	2,9	3,3	3,2	3,12
Establecer relaciones entre teoría y práctica	3,5	3,5	3,5	3,6	3,4	3,50
Relacionar los contenidos de la asignatura y obtener una visión integrada	3,2	3,1	3,2	3,4	3,2	3,22
Aumentar el interés y la motivación por la asignatura	2,6	2,8	2,8	3,0	2,8	2,80
Analizar situaciones de la práctica profesional	3,7	3,3	3,3	3,5	3,4	3,44
Indagar por tu cuenta en torno al trabajo planteado	3,0	1,6	2,9	3,1	3,1	2,74
Tomar decisiones en torno a una situación real	3,6	3,3	3,2	3,5	3,4	3,40
Resolver problemas u ofrecer soluciones a situaciones reales	3,4	3,2	3,3	3,3	3,2	3,28
Desarrollar tus habilidades de comunicación (oral o escrita)	3,0	2,8	3,1	2,8	2,7	2,88
Desarrollar tu autonomía para aprender	2,9	2,7	3,2	2,9	2,9	2,92
Tomar una actitud participativa respecto a tu aprendizaje	3,3	3,1	3,3	3,1	3,1	3,18
Mejorar tus capacidades de trabajo en grupo	3,3	3,3	3,5	3,5	3,3	3,38
Desarrollar competencias necesarias en la práctica profesional	3,4	3,1	3,3	3,3	3,1	3,24
El sistema de evaluación ha sido adecuado a la metodología	3,0	2,8	2,8	3,1	3,1	2,96
Si en el futuro pudieras elegir ¿optarías por esta metodología? Sí (%)	24 (88,9)	30 (73,2)	29 (87,9)	38 (95,0)	41 (93,2)	

4. Discusión

Se aprecia una alta valoración de los ítems de capacidad de trabajo en grupo, adquisición de actitud participativa con su aprendizaje, relacionar teoría-práctica, analizar situaciones de la práctica y tomar decisiones. La satisfacción del alumnado con estos aspectos de la metodología se ha observado en otros estudios anteriores (3,5). Indagar sobre el trabajo planteado y aumentar la motivación por la asignatura fueron los ítems menos valorados, probablemente debido a la mayor carga de trabajo asociada a las metodologías activas (3). Si bien la motivación por la asignatura se ha mantenido, el alumnado ha ido calificando con una mayor puntuación en el ítem de Indagar por tu cuenta en torno al trabajo planteado. Esto quizás se deba a la mayor experiencia por parte de los docentes a la hora de instruir en dicha competencia.

El porcentaje de estudiantes que optarían por MdC de nuevo en un futuro ha sido muy alto en todos los cursos, especialmente en los dos últimos (>93%), probablemente relacionado con una mayor destreza adquirida por los docentes en dicha metodología y, como las medias de la tabla 2 indican, por la percepción del alumnado de beneficio que supone el trabajar con el MdC frente a la metodología tradicional expositiva.

5. Reflexiones

Desde su implantación en 2014, el MdC se ha insertado en el currículum de la asignatura Enfermería Geriátrica de manera exitosa. La implicación y alta satisfacción demostrada por el alumnado anima a continuar trabajando con esta metodología. A futuro, sería deseable medir el valor añadido del MdC evaluando resultados de aprendizaje superando la satisfacción del alumnado.

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Las emociones de los estudiantes de grado de Enfermería ante los diferentes momentos de aprendizaje

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Resumen

Introducción. El Grado de Enfermería ha experimentado cambios importantes en los últimos años derivados de su adaptación al Espacio Europeo de Educación Superior. Sin embargo, la gestión emocional ante situaciones de estrés no se ha abordado, siendo un elemento importante. El presente estudio aborda el objetivo de estimular la evolución en la gestión emocional a lo largo de la formación de los alumnos del Grado de Enfermería.

Método: Diseño observacional, longitudinal y prospectivo en estudiantes de 3º Grado de Enfermería. Las variables evaluadas fueron: dimensiones de la Inteligencia Emocional Percibida (IEP), el género y la edad. Para el análisis se usaron las tablas de contingencia y la prueba t de muestras relacionadas.

Resultados: Participaron 42 estudiantes con una media de edad (24.81 ± 1.164 años). No se encontraron cambios significativos entre las dimensiones de la IEP en los dos momentos de la medición. En cambio, se observó una relación de dependencia moderada y estadísticamente significativa entre la edad y la comprensión. En el sexo se apreció una relación de dependencia moderada y significativa con la percepción.

Conclusiones: La IEP no experimenta variación a lo largo de la formación académica. La edad y el género influyen en la gestión emocional de los alumnos de enfermería.

Palabras clave: nursing students, emotional management, learning.

Abstract

Introduction. The Nursing Degree has undergone significant changes in recent years, deriving from its adaptation to the European Higher Education Area. Nevertheless, the management of emotions during stressful situations has not been dealt with, even though it is an important issue. The present study is aimed at stimulating evolution in the management of emotions in nursing students over the course of their training.

Method: Observational, longitudinal and prospective study of third-year nursing students. The variables evaluated were: dimensions of Perceived Emotional Intelligence (PEI), gender, and age. Contingency tables and the t test of paired were used for analysis.

Results: 42 students participated, with an average age of (24.81 ± 1.164 years old). Significant changes were not found between the dimensions of PEI at the two times of measurement. On the other hand, a relationship of moderate and statistically significant dependence was found between age and comprehension. In sex, a relationship of moderate, significant dependence was found with perception.

Conclusions: PEI doesn't change over the course of academic training. Age and gender influence the handling of emotions among nursing students.

Keywords: nursing students, emotional management, learning.

1. Metodología

Es un estudio observacional, longitudinal y prospectivo. Se ha medido la IEP en alumnos 3.º de Enfermería, en dos momentos diferentes del primer semestre: al inicio del semestre, y a la finalización de la formación teórica, donde se ha impartido contenidos de Salud Mental y Cuidados Paliativos, incluidos en las asignaturas de las Enfermería Clínicas.

El instrumento de evaluación fue el test *Trait Meta-Mood Scale* (TMMS-24), elaborado por Salovey *et al.* (1995),modificado y adaptado al español por Fernández-Berrocal *et al.* (2004). Explora tres dimensiones de la IE: atención emocional (Percepción), claridad emocional (Comprensión) y gestión emocional (Regulación).

Las variables de estudio fueron: edad, género y los componentes del TMMS-24.

Para determinar las diferencias entre las dimensiones de la IEP en dos momentos, se realizó una prueba T para muestras emparejadas.

Para averiguar si existía la posibilidad de una asociación entre las dimensiones de la IEP, el género, y la edad, se analizaron los datos categorizados mediante las Tablas de Contingencia y el coeficiente de contingencia, cuyo valor está comprendido entre 0 y 1.

Las dimensiones de la IEP se categorizaron en tres niveles: Percepción 0 debe mejorar por poca atención, 1 adecuado y 2 debe mejorar por exceso de atención; Comprensión y regulación: 0 debe mejorar, 1 adecuado y 2 excelente. Y la edad: 0 = »Menor de 25», y 1 = «Mayor o igual a 25».

La significación se consideró para $p < 0.05$. El análisis se hizo con el programa estadístico SPSS versión 22.

2. Resultados

Los 42 participantes, tenían una media de edad de 24.81±1.164 años. El 66,7% estaba comprendido entre 19-24 años y el 33.3%, osciló entre 25y 48 años.

Al estudiar la relación de independencia entre edad categorizada y las tres dimensiones de la IEP categorizadas, se puede observar que hay una relación de dependencia moderada y además estadísticamente significativa entre la edad y la comprensión (CC = 0.328, p-valor = 0.025). Según sexo, hay también una relación de dependencia moderada y significativa con la percepción (CC = 0.415, p-valor = 0.013).

Se analizaron las relaciones entre la edad y cada una de las dimensiones.

En el caso de la percepción, solo 9.5% de la muestra presta demasiada atención y de ellos 25% son menores de 25 años. La categoría más representada es la de adecuada percepción con un 66.7% de la muestra, de los cuales 67.9% son menores de 25 años.

En el caso de la comprensión no hubo individuos que presentaran poca comprensión y la mayoría, un 61.9% mostraron una excelente comprensión. Esta categoría está distribuida de manera diferente en función de la edad: hubo un 53.8% menores de 25 y un 46.2% mayores de 25. 87.5 % de los alumnos con adecuada compresión son menores de 25 años.

En el caso de la regulación la situación es muy diferente. Toda la muestra está entre debe mejorar su regulación y adecuada regulación. Del total de la muestra 41.5% son alumnos menores de 25 años que deben mejorar su regulación, mientras que el 14.6% son alumnos mayores de 25 años, con adecuada regulación.

La relación de dependencia entre el sexo y las tres dimensiones de la IEP es fuerte y estadísticamente significativa (CC = 0.415, p-valor = 0.013) entre el sexo y la percepción.

En cuanto a la dimensión de la percepción, el mismo porcentaje de hombres y mujeres prestan demasiada atención. En el caso de la adecuada percepción hay 96.4% mujeres y 3.6% hombres.

En la dimensión de la compresión, los hombres de la muestra estaban en la categoría de excelente percepción, representando el 9.5% de la muestra total.

En cuanto a la regulación, el porcentaje de hombres que debe mejorar su regulación es mucho menor al de los que tienen adecuada regulación (*25% versus 75%).* En el caso de las mujeres la situación es al revés (*62.2% versus 37.8%*).

Se realizó una prueba T para muestra relacionadas para determinar las diferencias entre las dimensiones de la IEP medidas en dos momentos (Tabla 1).

Tabla 1

Medidas de la IEP en dos momentos

TMMS	Media	SD	p-valor
Percepción 1	28.78	4.762	0.654
Percepción 2	28.46	5.254	
Comprensión 1	36.34	6.696	0.305
Comprensión 2	35.61	6.271	
Regulación 1	22.64	4.498	0.334
Regulación 2	23.13	3.643	

Se puede concluir que no hay diferencias significativas entre las dimensiones de la IEP a corto plazo, aunque se puede ver un decrecimiento en la Comprensión entre la primera y la segunda medida.

3. Discusión

Los resultados de este presente estudio han puesto de manifiesto que hay una relación de dependencia significativa entre la percepción emocional y el género.

A la hora de identificar el porcentaje de hombres y mujeres que prestan atención excesiva, se ha visto que es el mismo. Resultado diferente a otros estudios donde las mujeres perciben más sus propias emociones (Extremera y Durán, 2007; Limonero *et al.*, 2004). En cambio, se observa que el porcentaje de hombres que tiene que mejorar la regulación de sus emociones es menor que el de las mujeres. Este dato coincide con el estudio de Extremera y Durán (2007). Hay que tener en cuenta que en el presente estudio de los 42 participantes, 4 eran hombres.

Asimismo, se observa en este estudio una relación de dependencia significativa entre la comprensión de las emociones y la edad.

Más de la mitad de los participantes, presentan una excelente comprensión, estando repartida entre los dos grupos (menores y mayores de 25 años), y la mayoría que tienen una adecuada comprensión, son menores de 25 años. Uno de los resultados de un estudio elaborado con adultos españoles entre 17 y 76 años, fue que los adultos de mediana edad tenían mayores niveles de IE, excepto en la comprensión de las emociones que disminuía progresivamente con la edad (Cabello *et al.*, 2016).

Para finalizar, la IEP se mantuvo igual a lo largo de la formación académica. Aunque la edad, pueda influir en la evolución de la IE a largo plazo, se relaciona más con la Comprensión, siendo solo una parte de la gestión emocional. Se debe analizar qué contenidos teóricos pueden ser los más adecuados para realizar un trabajo más profundo de las emociones en el Grado de Enfermería. En este curso concreto, las materias que mejor podrían responder a este objetivo serían las áreas de Salud Mental y Cuidados Paliativos.

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From the knowledge and competence-based learning in the field of fluid mechanics and hydraulic engineering to the full employment of the graduates

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Abstract

The Department of Nuclear Engineering and Fluid Mechanics of the Faculty of Engineering in Bilbao, which belongs to the University of the Basque Country (UPV/EHU), offers a complete and unique training program in hydraulic studies. The holistic design of the curriculum has turned out to guarantee the success in the full employment of the graduates following the hydraulic specialty. The details of the learning plan presented here, combines both knowledge learning and situated learning based on competence acquisition.

The specific and transversal skills of the students are developed throughout the Bachelor's degree of Industrial Technology Engineering and the Master´s degree of Industrial Engineering in the compulsory subjects of Fluid Mechanics and Fluid Facilities and Machinery and in several optional subjects of the majoring studies in Hydraulic engineering (e.g. Fluid Mechanical Power Plants and Alternative Energy Sources, Hydraulic Resources Management and Hydroelectric Power Plants, Hydraulic Power, Pneumatics, Fluid Pipeline Networks, Hydraulic System Operation and Maintenance and Computational Fluid Mechanics). In addition, the majority of the students have the opportunity and decide to follow an internship program in companies of the local and regional industrial environment, supervised by the tutors in the company and the University, and where the specific skills acquired in the studies have to be deployed. As a result of the practical work in the company, a final project is developed and defended in front of a tribunal.

After finishing the University Master in Industrial Engineering, our graduates are ready to incorporate to the job market. This is possible because the whole teaching staff is focused in emerging experiences that foster the active learning of the student body that feels encouraged and involved in the development of the hydraulic knowledge throughout the specialty. The acquisition of the competences related to the aforementioned subjects implies the continuous stimulation of the student that must develop skills in inquiry and innovation, both in the undergraduate and in the master. The work presented here shows the characteristics of the teaching-learning experience and gathers the detailed data corresponding to 100 % of employed graduates during the years when Bolonia plan has been working.

1. Introduction

Due to the importance of fluids in our everyday life (atmosphere, air that we breathe is a gaseous fluid and we have liquid fluid in rivers, seas or even inside our body), the Department of Nuclear Engineering and Fluid Mechanics considered that future industrial engineers needed to have a deep knowledge in hydraulics **[1]**.

The world of fluids implies many disciplines that are difficult to bring together. Anyway, according to the tradition of the Faculty of Engineering in Bilbao in the water sector, a specialty was developed for the Industrial Engineering degree in order to work on the most relevant issues of the water sector (Management, Operation, Pipeline Networks and Hydroelectric Power Plants **[2,3]**), together with some other disciplines related to the

operation such us CFD, Hydraulic Power or Pneumatics. This specialty is a unique case in Spain among all the Master's degrees offered in industrial engineering.

Students need to get the competences by carrying out alternative activities, based on the innovation. After passing the subjects, they are ready to incorporate to the job market. An Educational Cooperation Program sets the students in the path of the job market for the first time where they develop their Master´s Thesis in situ. Often, after finishing their studies at the university, they end up working in the same companies. The university teaching encompasses a curriculum of a degree that enables the practice of the Industrial Engineering profession with regulated professional assignments **[4]**. Among the competences, the following are included: design, test and analysis of fluid machinery and design and development of projects for fluid facilities.

The final objective is to get the students into the job market within the hydraulic area and the covered academic path will be described in the following sections.

2. Bachelor's Degree and Bachelor's Thesis

In the Bachelor's degree of Industrial Technology Engineering, students start to study the fundamentals of Fluid Mechanics during the 2nd academic year by means of a compulsory subject with 6 ECTS credits. This subject is the basis for the rest of the hydraulic studies.

During the 4th academic year students can choose a preintensification. In the so-called "Energetic Technics" preintensification, energies related to fluids are briefly explained: Hydroelectric Power Plants, Tidal and Wave Power Plants and Wind Farms.

The contents learnt in these subjects is usually applied when students develop the Bachelor's Thesis than implies 6 ECTS credits. Within this framework, every academic year different restoration and improvement projects are developed for minihydraulic power plants, wind farms are designed, etc.

Even though students that finish the Bachelor's Thesis are graduates in Industrial Technology Engineering, most of them carry on with their academic training and join the Master's degree of Industrial Engineering.

3. Master's Degree in Industrial Engineering: Hydraulics Specialty. Practices in Companies and Master's Thesis

Due to the importance of hydraulic machinery (pumps, for example, are the most used type of machine after engines), there is a compulsory subject related to Fluid Facilities and Machinery with 4,5 ECTS credits during the 1st academic year of the master. Besides, there are 10 specialties offered within the master and, among them, the Hydraulic Engineering specialty implies 30 ECTS credits that comprises the subjects shown in *Table 1*.

Table 1
Subjects that make up the Hydraulics Specialty

Subject	Academic year	Four-month	Credits (ECTS)
Hydraulic Resources Management and Hydroelectric Power Plants	1	2	6
Hydraulic Power	1	2	3
Pneumatics	2	1	3
Computational Fluid Mechanics	2	1	6
Hydraulic System Operation and Maintenance	2	1	6
Fluid Pipeline Networks	2	1	6

A brief description of these subjects is given below:

- Hydraulic Resources Management and Hydroelectric Power Plants: together with the development of the syllabus of the subject the student must develop a project that will contain and quantify the hydrological and energetic needs in the short and long term; the water basin needs to be characterized and its potential will be evaluated in order to install hydroelectric power plants that will be optimized hydraulically and economically.
- Hydraulic Power: the objective is to study the generation, transmission and control of motions and forces produced by pressurized oil. The subject is developed with a high experimental and practical orientation, where the students will design a wide variety of fluid power circuits, with the corresponding computational simulation and experimental testing in the hydraulic benches of the laboratory.
- Pneumatics: this subject explores the principles and uses of Pneumatics; students learn to define a pneumatic circuit in order to get a specific action, to program defined sequences of action and finally, to assemble the elements in a pneumatic panel according to the sequence needed to get it. Abilities acquired will be shown by developing these entire tasks in a project.
- Computational Fluid Mechanics: the student is initiated in the knowledge of numerical methods. Different practical examples where fluid mechanics is present are simulated. First, complete computational models are set up, followed by a calculation process and a final solution. A post-processing analysis of the results is needed to understand the validity of computational fluid mechanics codes.
- Hydraulic System Operation and Maintenance: the focus in this subject is practical, with hands-on exercises using R **[5]**. Students learn to solve real-life problems in the field of, generally speaking, water management. That is, the methodology followed is the learning by problems approach. Classes are typically sessions of 2 hours in which students, after a brief introduction by the teacher, need to solve an exercise.
- Fluid Pipeline Networks: the fields of application of fluid networks are very varied and using the EPANET **[6]** software different fluids are modeled (water, air, organic fluids, etc.), being able to simulate any situation (the problem of meshed or branched networks) of the current "piping".

The average dimension of the group of students selecting the specialty of Hydraulic Engineering is of 15. The companies that develop their work in the hydraulic sector (engineering, consultancy, manufacture of hydraulic machinery, public companies related

to water management, etc.), turn to the Faculty of Engineering in Bilbao, by means of the Educational Cooperation Program to get students that have studied the Hydraulics specialty. These students will have the chance to put into practice their knowledge and start their professional experience.

Most of the students develop their Master's Thesis in the framework of this program and finish their academic training being able to get into the job market within the hydraulic field.

4. Jobs in the Hydraulic Field

Due to a self-imposed continuous improvement process, the teaching staff related to the subjects of the Hydraulics specialty try to carry out a monitoring of the graduates and, at the same time, set up new contacts with companies of the fluid mechanics and hydraulic engineering sector.

The teaching staff make contact with the graduates and ask them to inform about the type of company they are working in. Results since the master started are shown in *Table 2*.

Table 2
Working condition of the graduates of the Master's degree of Industrial Technology Engineering

Academic year	Working	Studying	Hydraulic field	Other fields
15-16	100%	0%	60%	40%
16-17	100%	0%	71%	29%
17-18	90%	10 %	71%	29%

All the graduates that have answered are studying or working in different fields (R&D, design an development, testing, manufacturing, construction of facilities, commercial, management) and different technological areas (water treatment, hydraulic machinery, automotive, environmental engineering, electricity production power plants). Most of them are related to the hydraulic sector and, as a result, the teaching staff considers the final result satisfactorily. This survey has proved the high demand in industrial local companies of graduates at the level of MSc majored in hydraulic engineering. According to this outcome, the progressive growth in the enrolment of students during these years is coherent with the success in the fast entrance into the labor market of our graduates.

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Situated Learning in the instructional Laboratories of the Fluid Mechanics Area of the Engineering Studies: Definition of the Problem and Design of the Solution

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Abstract

In order to achieve a significant situated learning through the instructional laboratories of the subjects in the area of Fluid Mechanics of the bachelor and master studies in Industrial Engineering of the Faculty of Engineering in Bilbao, the educational innovation project FLUID-IBL was born in 2018. This project intends to develop and establish an effective methodology and the corresponding teaching instruments aligned with the "inquiry based learning" approach where the students learn from their own experience by investigating in a collaborative way.

In the framework of this educational innovation, some deficiencies affecting the teaching-learning process in the practical tasks of the instructional laboratory have been detected and analyzed: (i) the student body develops tasks without being aware of the objective of the research or the principle that is being checked; (ii) the oral and written communication is inadequate with typical signs of plagiarism; (iii) the cooperative work is not carried out properly; and (iv) the faculty is diverse and general guidelines in methodology and evaluation are not always fulfilled.

In order to figure out the problem, during 2018, 5 tasks have been developed to analyze and transform the teaching procedures: (T1) evaluation of the marks obtained by the students as the basis of the methodology; (T2) discussion and evaluation of the current teaching methodology among the faculty; (T3) evaluation of the teaching procedures by the ex-student body by means of interviews and surveys; (T4) detailed and agreed definition of a new formative, progressive and competency-based assessment; and (T5) planning of the existing evaluation instruments and creation of new ones. In accordance with this analysis, implementation of some proposals and measures and the corresponding analysis of the results will take place during 2019. Firstly, the new evaluation resources and methodological innovations will be applied (T6). Then, the obtained impact in the learning process of the student body will be quantified by comparing results before and after the implementation of the actions (T7).

This piece of work presents the results of the first 5 tasks that have already been carried out and shows the actuation plan for the last 2 ongoing tasks.

1. Introduction

The educational innovation project FLUID-IBL started in March 2018 with the objective of achieving a significant situated learning in the instructional laboratories of the Fluid Mechanics area of the bachelor and master studies in industrial engineering of the Faculty of Engineering in Bilbao **[1]**. The faculty that is involved in this project has developed a structured strategy to solve the deficiencies affecting the teaching-learning process in the practical tasks of the instructional laboratory so that the student body will be able to reach the expected learning outcomes.

The lack of a clear definition of the learning objectives and a clear evaluation of their achievement represents a general problem for engineering subjects **[2,3]**. Besides, laboratory

tasks have a relative high weight in terms of ECTS credits for the two subjects that have been considered within the project (*Fluid Mechanics* and *Fluid Facilities and Machinery*) and this adds a distinctive feature to the management and the evaluation of the student body **[4-6]**. In this case, a high degree in experimentalism is demanded in order to learn the basic principles of fluid mechanics and the operation of fluid machinery. This way, a constructivist learning will be developed based on the experience itself. The transition of engineering studies towards a competency-based pedagogy takes this kind of situated learning into account **[7]**.

These are the main objectives of this work:

1. Optimize a significant situated learning for the student body by means of laboratory practices in the compulsory subjects in the area of Fluid Mechanics.
2. Obtain an effective collaborative work of the teams of the student body.
3. Carry out a clear and objective evaluation of the learning results developed by the student body by means of detailed evaluation criteria and instruments (e.g. rubrics).
4. Carry out a continuous training evaluation of the laboratory tasks, in time and with feedback.

2. Analysis of the Problem

In the context of the aforementioned two subjects, laboratory practices turn out to be an appropriate methodology to develop this strategy and these learning results are pursued:

- Use instrumentation to measure physical variables of fluids in order to understand, characterize and demonstrate their behavior and the operation of machines involving fluids.
- Interpret and analyze experimental results by data processing and comparison with the theoretical predictions.
- Issue a technical report with a critical evaluation of the experimental work carried out together with an adequate oral and written communication.

All the students need to take the two subjects that have been considered within the project for the Bachelor's degree of Industrial Technology Engineering (360 enrolled students) and the Master's degree of Industrial Engineering (220 enrolled students) in three different linguistic profiles, Basque, Spanish and English. The number of students in every group is high: 75 students for lectures and 25 students in laboratories.

The faculty has identified these problems related to the laboratory practices: (i) the student body develops tasks without being aware of the objective of the research or the principle that is being checked; (ii) the oral and written communication is inadequate with typical signs of plagiarism; (iii) the cooperative work is not carried out properly; and (iv) the faculty is diverse and general guidelines in methodology and evaluation are not always fulfilled.

3. Tasks that Have Already Been Developed

In order to figure out the identified problems, during 2018, 5 tasks have been developed to analyze and transform the teaching procedures: (T1) evaluation of the marks obtained by the students as the basis of the methodology (see *Table 1*); (T2) discussion and evaluation

of the current teaching methodology among the faculty; (T3) evaluation of the teaching procedures by the ex-student body by means of interviews and surveys (*Figure 1* shows some of the results); (T4) detailed and agreed definition of a new formative, progressive and competency-based assessment; and (T5) planning of the existing evaluation instruments and creation of new ones.

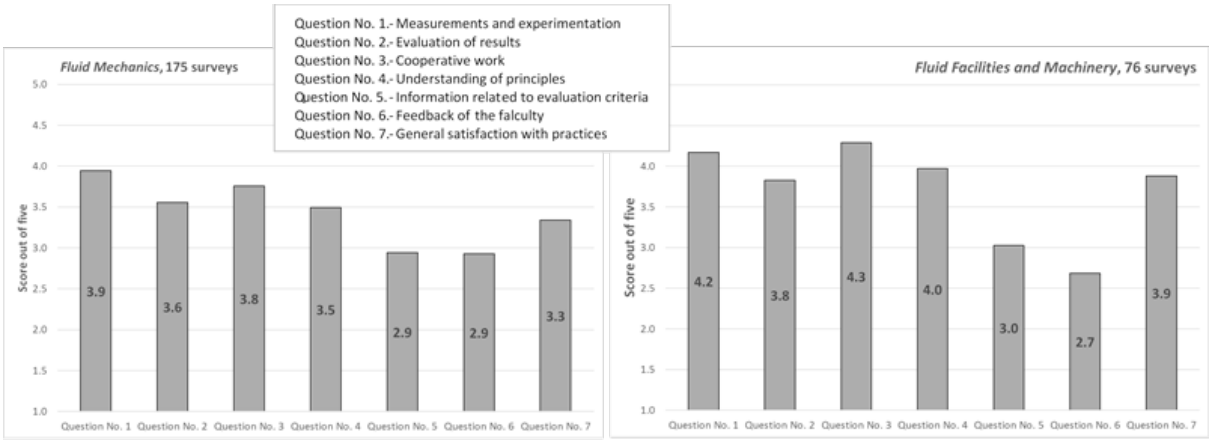
Table 1

Results obtained in the assessment of tasks: higher average and lower dispersion in the marks obtained in the laboratory in comparison to the exam indicating low level of discrimination among the body of students in the laboratory task of both subjects

Subject	Enrolment (No. of students)	Passed (1st call)	Exam		Laboratory	
			Average mark (out of 10)	Standard deviation	Average mark (out of 10)	Standard deviation
Fluid Mechanics (18/19)	325	30,80%	3.74	2.09	6.69	1.32
Fluid Facilities and Machinery (17/18)	201	83,58%	5.80	1.47	6.82	0.40

Figure 1

Results of the surveys made to the student body of both subjects: 7 specific questions were made to know the grade of satisfaction related to different aspects of the laboratory practices. In both cases, information related to evaluation criteria and feedback obtained the worst score



4. Results and proposal for improvements

In accordance with this analysis, implementation of some proposals and measures are already taking place during 2019. The faculty related to the project has decided to focus the efforts on 4 specific issues related to feedback, evaluation procedures and plagiarism:

1. Provide a *feedback* of the evaluation of the first deliverable of the laboratory practice to every student before the due date of the second deliverable, so that improvements

can be implemented in the subsequent deliverables. Although the usefulness of the feedback as an educational tool in this kind of practical activities is well known **[8,9]**, a complete feedback schedule for the whole academic term is not viable due to the large number of students.

2. Publish the *evaluation criteria* taken into account for the laboratory practices. The lack of clear and well-supported guidelines and instructions in a particular technical work that leaves the student body working on its own initiative without the basic technical knowledge, can lead to fail the laboratory practice **[10]**. In this sense, the publication of the evaluation criteria complements the already available laboratory guidelines and, therefore, the student body will more easily achieve the learning objectives of the laboratory practices.
3. Develop a *rubric* for the correction of the deliverables related to the laboratory practices. The faculty, which is diverse, has decided to homogenize the correction standards by means of rubrics that will uniform them. This change in the correcting procedure is expected to minimize the human influence and cause a higher dispersion in the marks that will make distinctions among laboratory practices.
4. Implement simple coercive *actions to avoid plagiarism*. On the one hand, students will have to provide a handwritten copy of the measurements taken before they leave the laboratory. As long as these measurements should be the basis of the results shown in the report, this correlation can be checked anytime. On the other hand, the reports provided by the student body for their deliverables (computer files) need to be created in the ongoing academic year so that the use of templates from one academic year to another is somehow avoided.

5. Future Activities

Firstly, the new evaluation resources and methodological innovations described in the previous paragraph will be fully applied in the two subjects related to this project. They have already been applied for *Fluid Facilities and Machinery* during the second four-month period of the current academic year, 2018-2019, and they will be applied for *Fluid Mechanics* during the first four-month period of the next academic year, 2019-2020. This will fulfill the so-called task T6 and, then, the obtained impact in the learning process of the student body will be quantified by comparing results before and after the implementation of the actions (T7).

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Support for Learning and Efficiency of Videolectures in the Medical Course of Paediatrics

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Abstract

video lectures are becoming popular but are they as effective and learning supportive as expected? In the context of our survey videolectures are used as theoretical material in the clinical subject paediatrics. The goal of the study was to find out how much students actually watch videolectures and how they evaluate the use of videolectures for their study preparations (for seminars and exams) and for overall learning. Survey was carried out among the students in the course of paediatrics. Students were asked to complete the survey in the web-environment. As well panopto statistics were used. As result of the survey students reported that they liked the possibility to study with videolectures. At the same time for some students this was not the preferred learning style. Depends on the different features of the videos, how much they support or do not support student learning and study preparations. Students reported that the quality, length and speed of videos are the essential features that influenced their learning from videos. Videolectures can be effective tool for supporting learning, but only, when used as supplementary material with auditorial seminars and tutorials.

1. Background

In higher education, the use of e-learning technologies increased significantly in order to modernize learning, provide learners with more appropriate learning paths and support deep learning (O'Bannon *et al.*, 2011). The use of e-learning helps to solve a number of problems related to curriculum design and the structure of studies, and in addition to the diversification of learning (Giannakos, 2013, Johnston *et al.*, 2013).

Medical education is characterised by a high volume of student workload, is complex and requires intensive study arrangements. As a result, several clinical subjects in the field of medical sciences of the University of Tartu are time-scattered resulting in a long-time lag between the lecture and the practice-seminar cycle. Too long brake between the theoretical and practical form of study and a very large amount of classroom teaching does not support studies and the motivation to attend the lectures (Bates *et al.*, 2018; Massingham & Herrington, 2006).

One way to solve this problem is to use video lectures. Bertsch *et al.* (2007) have shown that video lectures can support coping with medical terminology (use and pronunciation), understanding the complex concepts, reviewing material before practical study or exams. Videos are also supporting learners who otherwise have no opportunity to participate lectures (Johnston *et al.*, 2012). Learning is most supported when videos are viewed

repeatedly, paused, notes are taken, and information about the lecture is discussed with other students. Passive viewing of videos supports learning less (Cardall *et al*., 2008; Topale, 2016).

Since 2017/2018, there is one clinical subject at the University of Tartu in the Faculty of Medicine, Paediatrics, where the lectures are completely replaced by video lectures. Students have to watch a video lecture with added slides and make an electronic test on a given topic before the every seminar, every day for four weeks. Passing the test gives a ticket to the seminar. During the seminar, the topic is discussed and in the following tutorial, the topic is applied. With such teaching rearrangement, there was a desire to minimize the time-consuming lecturing and to improve student learning and preparation for auditory learning.

2. Survey

The goal of the survey was to find out how much students actually watch video lectures, how they use them and how they evaluate the use of video lectures for their study preparations (for electronic tests, seminars and exams) and for overall learning, also in which form the learning materials are preferred by students for learning.

The survey was carried out among all students who passed the exam in Paediatrics. Students were asked to complete the online questionnaire. Completing the questionnaire was voluntary and anonymous. 55 (46%) from 119 students completed the questionnaire. In addition, the statistical data from Panopto was used.

3. Results

The results of the survey showed that most of the students (79.9%) looked at video lectures. Nearly the same amount (74.8%) of students used the video lecture slides in pdf format for learning. Based on Panopto statistics, 59 students from 119 reviewed video lectures (of a total of 50 lectures) at least 50 times, 9 students never opened any video lectures. Students reviewed video lectures for an average of 16 minutes and an average of 60% of each lecture. The correlation analysis showed an average negative relationship between the length of the video lecture and the watching proportion (%) of the video ($r = -0.62$, $p < 0.01$). The shorter the video lecture, the larger the portion of it was viewed. Earlier studies (O'Bannon *et al*., 2011) also confirm that longer video lectures are viewed in less or less time.

Based on the results of the survey, video lectures were most helpful in understanding the topic (97.5% of respondents), preparing for electronic tests and seminars (86.2%). Video lectures helped less to prepare for the written exam (79.1%) and the oral exam (49.9%). Video lectures contributed exactly to what was expected - to understanding the topic, taking tests, and preparing for seminars. Seminars prepared students for a written and oral exam.

Most students (65.5%) completed tests after watching video lectures, and 12.7% did not watch video lectures for tests at all. The correlation analysis did not show a significant correlation between the student's exam grade and the number of watching of the video lectures ($r = 0.19$), the watching time ($r = 0.269$), the average watching time ($r = 0.319$) and the watching length of the video (%) ($r = 0.269$).

According to the questionnaire results, the greatest benefit is provided by the slides in PDF format (83.6% of respondents), electronic tests and the video with slides (80.0%), 3.6% of learners would prefer a face-to-face lecture instead of video lectures.

Students reported that the video lecture supports learning when the lecture can be viewed at the suitable time, in the suitable place, if it is short and with good sound quality, and the lecturer speaks with good speed (not too slow) and also gives examples rather than reading the text from the slides. The quality, length and speed of videos are the essential features that influenced their learning from videos. In addition, electronic tests were perceived as a strong motivator for watching videos.

4. Conclusion

Thus, it can be concluded that this study broadly confirmed the findings of previous studies and made it even clearer that the use of video lectures in teaching requires careful consideration of both the organization of learning and the presentation of videos. Videos are an effective tool to transfer knowledge but needs considering, how they are presented and what is presented in videos. As well, the quality of the video and tasks following videos seem to be essential to support learning with video lectures. Video lectures can save time from lecturing and can be an effective tool for supporting learning but they cannot replace all face-to-face learning. The efficiency of video lectures and the satisfaction of students with learning is bigger when interactive face-to-face seminars are used in addition to video lectures (Cardall *et al*., 2008; Jensen, 2011; O'Bannon *et al*., 2011; Ronchetti, 2010; Schreiber *et al*., 2010).

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Out into the fields - exploring the role of fieldwork in geography education

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Abstract

Fieldwork is an important component of the bachelor programme in Human Geography and Spatial Planning. Students learn outside the classroom during fieldtrips in Utrecht, in the Netherlands and Europe. This study explored the meaning of fieldwork in this bachelor programme. According to both teachers and students, fieldwork is an essential part of the bachelor programme. They report that fieldwork enables students to better understand the 'messiness' of 'geographical reality', to develop subject knowledge, and to gain a range of skills that are difficult to develop in the classroom alone. Moreover, fieldwork motivates students and aids their self-development. Fieldwork, when well embedded, can generate deep approaches to learning. Although fieldwork is present in several courses spread over all years of the bachelor, striking a balance between repetition and building competences proves difficult. Deep learning also requires reflection and feedback on time spent in the field. Our study reveals that most undergraduate students are not used to reflect on their attitude, skills and behaviour in the field. We therefore recommend to pay more specific attention to these skills, to reap the benefits of fieldwork.

1. Introduction

Fieldwork, defined as *'any component of the curriculum that involves leaving the classroom and learning through first-hand experience*" (Boyle *et al.*, 2007, 300) is an important component of geography education worldwide. Fieldwork amongst others supports students in recognizing theoretical concepts and applying these to real world situations. It stimulates students to develop subject specific skills, as well as general data collection and analysis skills. Fieldwork also enables students to acquire 'soft skills' such as intercultural competences and ethical awareness (Kent *et al.*, 1997; Glass 2015). Not surprisingly, France and Haigh (2018: 498) frame fieldwork as '*a signature pedagogy and a near-unique selling point*' of geography education which oftentimes involves (implicit) experiential learning (Dummer *et al.*, 2008). Despite the many benefits, fieldwork also finds itself in a vulnerable position because of the costs and risks involved and the required staff time. Moreover, it is not always clear whether fieldwork reaches its full potential and leads to a deep approach to learning: learning geared at understanding (Herrick 2010) which arises when a "student searches actively for meaning and tries to relate it to prior knowledge, experience and learning, in this way transforming the knowledge gained" (Oost *et al.*, 2011, 312) Such deep learning requires a sound structure of the curriculum, active, student-centred assignments and a firm anchoring of fieldwork in courses (France & Haigh 2018).

This paper addresses the role of fieldwork in the bachelor programme in Human Geography and Spatial Planning at Utrecht University. As part of the cyclical process of evaluating the quality of the programme, we critically assessed our teaching philosophy and pedagogical practices. In this context, we explored the role of fieldwork, with a particularly focus on the question whether this fieldwork contributes to deep learning.

Four different methods for data collection were employed: a literature review, an inventory of fieldwork in our bachelor programme, in-depth interviews with 11 experienced instructors that designed different forms of fieldwork in their courses and 5 rounds of focus group discussions with first level BA students, using statements and open questions.

2. Findings

Fieldwork is firmly embedded in the curriculum: it is part of compulsory courses and electives, in all three years, in all shapes and sizes. Already in the first 10 weeks of their programme students experience three different kinds of fieldtrips. These experiences are expanded on in the second period when students train data collection skills. In the last month of the first year all students take part in an international residential fieldtrip to a European destination, where they are taken on 'look see' tours, make observations, compare cities, and carry out small research projects. Data collection skills are thus introduced almost from the first week onwards, and further refined in the course of the three years – providing hands-on experiences with both qualitative and quantitative methods and culminating in a bachelor thesis which is based on independent empirical data collection by the students. Fieldwork in the bachelor programme is predominantly student-centred, at times student-led ('look-see' tours hosted by students) and in some courses teacher-led ('look-see' tours organized by teacher).

Both teachers and students in Utrecht refer to fieldwork as an essential part of the bachelor programme. Teachers mention that fieldwork enables students to better understand the 'messiness' of the world outside, and to develop subject knowledge. Teachers see fieldwork as an excellent means to develop skills that are difficult to train in the classroom. Teachers define fieldwork as more than a pedagogical tool, it embodies the core of geography and planning (education): *"it is what being a geographer or planner means."* Students indicate that they enjoy doing fieldwork as an activity and as a way of learning. They refer to fieldwork as '*enriching*', '*fun*', and '*very useful to recognize and understand concepts*'. Their learning becomes visible by the expanding jargon students used in the focus group discussions, concepts like *gentrification*, *proxies*, and *secondary sources* were increasingly referred to. Both students and teachers also mention that fieldwork motivates students and aids their self-development.

Notwithstanding the value of fieldwork, we observed two difficulties related to the impact of current forms of fieldwork on deep learning. Experiential learning forms the basis of much of the field assignments in year 1. Students get some instructions and feedback while they try out new data collection skills in the field. However, experiential learning does not automatically lead to deep learning. Teaching periods of 10 weeks hardly allow for students to go through the learning cycle several times. Moreover, research projects are often limited in size (limiting the number of completed questionnaires, interviews or observations) to make them manageable it the hours to be dedicated to the course. By the end of year one, we noticed some frustration among students in the focus group. On the one hand, they do feel they got a taste of doing research and actually experienced for example that there a ill-chosen hours for a door-to-door survey – even when it fits your personal calendar perfectly. On the other hand, the collected samples are often to small to perform many meaningful statistical analyses. Unintentionally, teachers increase frustration when they imply that the real exercise —a large quantitative research project— will follow later in year two; leaving students to wonder what the aim of the assignment was. Small-scale experiences with fieldwork and data collection can be meaningful and lead to deep learning, when teachers can have in-

depth conversations with students about their time in the field, provide feedback on the data collection, and stimulate reflection on the spot and afterwards in the classroom. However, the often time-pressured courses leave little space for in-depth reflection. Debriefing and feedback on the process is as such often focused on the technical aspects of the fieldwork. As a result, reflection on the learning effects is rather limited.

3. Outlook

In line with previous studies (Boyle 2007, France & Haigh 2018), both teachers and students in Utrecht highly value fieldwork. Fieldwork can be much more than joyful outdoor experiences, it can lead to deep learning. However, not all fieldwork reaches this potential. As time in the field and in class is often restricted, debriefing remains limited to short classroom conversations on the experiences of data collection. As a result, students are not trained to reflect on their attitude, skills and behaviour in the field and the implications this has for data collection. To achieve deep learning, we should pay more explicit attention to reflection and feedback, both in the field and upon return, using interventions designed to stimulate reflection as a means to achieve deep learning (Kent *et al.*, 1997; Dummer *et al.*, 2008; Herrick 2010; Oost *et al.*, 2011).

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Creación de contenidos online y entornos virtuales y semipresenciales como apoyo al aprendizaje significativo del Derecho Financiero Tributario en la Universidad del País Vasco/Euskal Herriko Unibertsitatea

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Resumen

La comunicación propuesta aborda una reflexión sobre las implicaciones de la modalidad virtual en nuestra práctica docente presencial, planteando el diseño de materiales didácticos y de actividades online que impulsen el aprendizaje significativo del Derecho Financiero y Tributario dentro de la Universidad del País Vasco.

Abstract

This paper addresses a reflection on the implications of the virtual modality in our face-to-face teaching practice, proposing the design of didactic materials and online activities that promote the significant learning of the Financial and Tax Law in the University of the Basque Country.

1. Introducción

Según Ausubel, el aprendizaje significativo implica la adquisición de nuevos conocimientos de forma relacional, imbricando una nueva información con aquella que ya se posee, lo que permite reajustar y reconstruir ambas informaciones dotándoles un de un nuevo alcance que, a su vez, permite a futuro la recepción y afianzamiento de nuevos conocimientos.

En la actualidad, la enseñanza del Derecho Financiero y Tributario en la Universidad del País Vasco se circunscribe al entorno del Grado en Derecho y del Doble Grado en Derecho-ADE, lo cual, por otra parte, la confina a un entorno limitado en cuanto a su contenido, al número de alumnos y al espacio físico y temporal que se le asigna. Igualmente, estas limitaciones constriñen los instrumentos que el docente puede utilizar, haciendo difícil la utilización de metodologías activas que impulsen el aprendizaje significativo de esta disciplina para parte de los estudiantes.

En este contexto, las nuevas tecnologías, en concreto la creación de contenidos online y el establecimiento de entornos virtuales y semipresenciales se erigen como herramientas fundamentales para que nuestros alumnos se embarquen en un proceso de búsqueda de nuevos conocimientos que trasciendan a escenarios más complejos, aquellos que les van a ser requeridos en entornos profesionales. Así las cosas, la incorporación de las TIC, los instrumentos Web 2.0 y las Comunidades Virtuales de Aprendizaje (CVA) pueden suponer un recurso eficaz a la hora implementar un aprendizaje profundo del Derecho Tributario, pero para ello se requieren una serie de elementos y condiciones que lo faciliten. De este modo, si bien lograr un aprendizaje significativo depende "del que aprende", corresponde al docente generar el clima adecuado y las estrategias que motiven que ese aprendizaje se desarrolle. Precisamente esta finalidad coadyuvante, el que estemos hablando de una suerte de *b-learning,* determina que, entre las plataformas facilitadas por eCampus, la plataforma a utilizar para su desarro-

llo sea eGela, y ello para que pueda ser un complemento a los alumnos matriculados en la asignatura sin necesidad de que cumplan o se registren en ninguna otra adicional a la que les es propia.

Antes de finalizar el curso, cada participante deberá realizar una serie de actividades que, en su caso, en función de la calificación obtenida, le permitirán participar en el examen final presencial de la asignatura. Las actividades a realizar, pormenorizadas en el apartado 5 de este plan docente, se subdividen en tres categorías:

2. Actividades, materiales y recursos a utilizar

El Derecho Financiero y Tributario tiene una orientación teórico-práctica en la que los objetivos de aprendizaje y competencias pretendidas se adquieren a través del estudio razonado de todas las unidades didácticas propuestas en la plataforma a modo de guía. Junto con el material propuesto, se requiere que los estudiantes realicen una serie de **actividades** como son:

- Actividades de Aprendizaje; actividades de tipo práctico para ampliar y consolidar los conocimientos adquiridos tras el estudio de las unidades y que consisten en la realización de trabajos de distinta índole basados en la participación activa y la creación colectiva del conocimiento.
- Actividades de Evaluación Continua, aquellas que contemplan la realización de casos o supuestos prácticos; memorias o informes, la búsqueda de jurisprudencia, bibliografía… Se distinguen de las anteriores en que tienen carácter individual.
- Controles a realizar tras cada grupo de unidades didácticas. Consisten en la realización de una prueba de evaluación tipo test en las que el estudiante dispone de dos intentos.

Resulta sumamente importante la existencia de una primera sesión presencial bautizada como "módulo cero", en la que los alumnos serán informados de los recursos, materiales y actividades a realizar, así como de las distintas herramientas con las que contará el curso para su desarrollo.

Los **recursos** a utilizar en el desarrollo de las diferentes actividades pueden ser de distinta índole en función del módulo que se vaya a trabajar, en cualquier caso podrían resumirse en los siguientes.

- *Vídeos* resumen del contenido teórico de cada uno de los módulos.
- *Documentos* y *archivos* de diversa naturaleza como textos legales, académicos, periodísticos sentencias…
- *Consultas* para realizar una encuesta rápida con el fin de que los alumnos reflexionen sobre un tema, para comprobar rápidamente que han entendido un punto en concreto…
- *Cuestionarios* con preguntas tipo opción múltiple, verdadero/falso, coincidencia, respuesta corta y respuesta numérica, y que pueden usarse para hacer exámenes del curso, mini test para tareas de lectura o al final de un tema a modo de *one minute paper*, controles de autoevaluación que nos faciliten información inmediata sobre el rendimiento de los alumnos…
- *Glosario*, para que los alumnos creen de forma colaborativa, a modo de diccionario, de términos y conceptos especialmente significativos para la materia.

— *Tarea,* que puede consistir en una AEC o una AA que luego la docente revisará, valorará, calificará y a la que podrá dar retroalimentación, y cuyo contenido digital puede ser diverso (documentos de texto, hojas de cálculo, imágenes, audio, vídeos…). Alternativamente la tarea podrá revisarse por pares entre los estudiantes de forma que se fomente el aprendizaje colaborativo y el sentido crítico sobre el contenido de la materia.
— Como complemento, se plantea la posibilidad de que los alumnos vayan completando un *portfolio* en el que vayan reflejando la realización de los pequeños trabajos de investigación que les vayan siendo encomendados.

En cuanto a los **materiales** (artículos doctrinales, periodísticos, normativa, presentaciones, sentencias), se estima que la lectura y comprensión de los contenidos teóricos abarcados en los distintos módulos debe ocupar en total unas 15 horas, mientras la realización de las distintas actividades evaluables, es decir, las Actividades de Evaluación Continua, las Actividades de Aprendizaje y la realización de los Controles, conllevará aproximadamente otras 22 horas. Igualmente se considera que el empleo de unas 10 horas por parte del alumno a la hora de preparar el examen final. El resto de horas, hasta completar la carga lectiva contemplada en los respectivos programas, deberá ultimarse con actividades presenciales en el aula que abunden en las competencias y contenidos adquiridos previamente por el alumnado en la plataforma virtual. Finalmente antes de finalizar el curso, y para poder acceder a participar en examen presencial, cada participante deberá haber obtenido al menos el 50% de la nota correspondiente al conjunto de actividades sugeridas en la unidad formativa, es decir, deberá alcanzar, al menos un 2,5 en la nota total de estas actividades.

3. Estructuración del plan docente

La estructuración del plan docente debe ser acorde con los objetivos de aprendizaje y competencias recogidas en el marco de la asignatura. Por motivos didácticos conviene hacer coincidir unidad didáctica y semana lectiva, de modo que el/la alumn@ pueda organizar su calendario de acuerdo al plan de estudios propuesto.

Del mismo modo, a fin de hacer valer esta experiencia como herramienta para que el/la alumn@ adquiera un aprendizaje significativo entendemos necesario plantear cada unidad didáctica con una secuencia temporal en la que las actividades, materiales y recursos propuestos respondan a la siguiente secuencia lógica: 1) ¿Qué sé sobre el tema? 2) ¿Qué información me transmiten sobre el mismo? 3) ¿He entendido? 4) Colaboro con mis compañeros a la hora de solventar dudas 5) Aplico mis conocimientos, 6) ¿(Qué) He aprendido?

Igualmente, es necesario imbricar las unidades didácticas planteadas en la plataforma virtual en las actividades presenciales propuestas en el aula, de forma que la interrelación de ambas esferas permita un mayor afianzamiento de los conocimientos obtenidos.

4. Conclusiones

La creación de materiales virtuales (o la utilización de los ya disponibles en la Red), el uso de los recursos referidos en los párrafos anteriores y el planteamiento de las distintas actividades propuestas organizando las unidades didácticas virtuales con la secuencia descrita, permite adaptar los conocimientos que el/la alumn@ tenía sobre la materia sin ser consciente de ello, confiriéndoles una nueva dimensión que, a su vez, le habilita para la recepción y

consolidación de los objetivos de aprendizaje pretendidos por el Derecho Financiero y Tributario. En este sentido, observamos cómo una buena articulación de los contenidos ofrecidos online en entornos virtuales y semipresenciales consolida el aprendizaje significativo de nuestros estudiantes reforzando las herramientas utilizadas en clase y paliando las carencias estructurales (número de alumnos, horas lectivas, recursos escasos…) propias de la enseñanza presencial.

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Hacklab: taller de cocreación de ideas. Un proyecto que potencia las ideas auto gestionadas por el alumnado con apoyo institucional para el talento. Las jornadas como espacio para premiar, inspirar y hacer networking

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Resumen

El HackLab es un taller de co-creación de ideas que tiene un espacio físico situado en las bibliotecas/CRAI (Centro de Recursos para el Aprendizaje y la Innovación) de los campus de Poblenou, Ciutadella y Mar de la Universidad Pompeu Fabra de Barcelona. Existe para promover, fomentar y facilitar el autoaprendizaje, el intercambio de conocimientos e ideas y la colaboración de temas como la tecnología, la comunicación o las humanidades. Por su parte, el HackLab es también una marca que engloba el apoyo a esta comunidad, tanto en las iniciativas que impulsen como en su conexión con iniciativas externas de interés.

Las Jornadas HackLab son eventos que tienen lugar una vez al año para que los y las estudiantes tengan la oportunidad de presentar sus proyectos y ganar premios. Se realizan HackTalks, donde los proyectos ganadores del premio HackLab, de otras ediciones, realizan presentaciones de sus ideas en charlas muy dinámicas. Otro de los puntos fundamentales de las Jornadas es la creación de un espacio de networking donde los asistentes pueden comunicarse entre ellos y empezar nuevos proyectos juntos. En resumen, es una oportunidad para animar a los estudiantes que ya tienen un proyecto pero también para que nuevas personas conozcan el HackLab y se animen a participar.

Cabe destacar, que los y las estudiantes que quieran presentar sus proyectos pueden hacerlo más de una vez siempre y cuando la idea o proyecto muestre evoluciones significativas. Por ejemplo, ese es el caso de GameSquare, quienes, en la primera convocatoria, ganaron una mención y se volvieron a presentar en la segunda convocatoria declarándose así ganadores del Premio Hacklab 2017-2018. Es por tanto una oportunidad de aprendizaje y mejora para los y las estudiantes y un mecanismo de motivación para su desarrollo académico y laboral.

Formar parte de un proyecto HackLab, al fin y al cabo, significa formar parte de un método de aprendizaje que, teniendo como base la investigación, enfatiza la puesta en práctica de los conocimientos adquiridos a lo largo de la formación académica y abre puertas de cara al futuro laboral. Así mismo, es una oportunidad para visibilizar y potenciar el talento que hay en la universidad más allá de las asignaturas.

Abstract

HackLab is a co-creation workshop for ideas that has a physical space located in the libraries/CRAI (Resource Centre for Learning and Research) of the Poblenou, Ciutadella and Mar campuses of the Pompeu Fabra University in Barcelona. It exists to promote, encourage and facilitate self-learning, the exchange of knowledge and ideas and the collaboration of topics such as technology, communication or humanities. For its part, HackLab is also a brand that encompasses the support of this community, both in the initiatives that it promotes and in its connection with external initiatives of interest.

The HackLab Workshop Days are events that take place once a year so that students have the opportunity to present their own projects and win prizes. HackTalks are carried out, where the winning projects of the HackLab prize, from previous editions, give presentations of their ideas in very dynamic talks. Another fundamental point of the Workshop Days is the creation of a networking space where at-

tendees can communicate with each other and start new projects together. In summary, it is an opportunity for new people to get to know HackLab and feel encouraged to participate.

The HackLab Workshop Days are an opportunity for students to be rewarded for their projects and their efforts. In addition, students who want to present their projects can do so more than once. For example, in the case of GameSquare, who, in the first competition, received a special mention and then returned to present their idea again in the second competition where they were declared the winners of the 2017-2018 HackLab Award. It is therefore an opportunity for learning and improvement for students and a motivational tool for their academic and professional development beyond the classroom.

Being part of a HackLab project, at the end of the day, means being part of a learning method that is based on research, emphasizes the implementation of the knowledge acquired throughout academic training and opens doors to future jobs. Furthermore, it is an opportunity to visualize and enhance the talent that exists in the university beyond the subjects taught there.

1. Las jornadas HackLab: un encuentro anual

La Universidad Pompeu Fabra tiene entre sus fines participar en el progreso de la sociedad, contribuir al intercambio de conocimientos y promover actividades de difusión del conocimiento. Con esta finalidad, se creó el HackLab como espacio para promover, fomentar y facilitar el autoaprendizaje, el intercambio de conocimientos e ideas y la colaboración alrededor de temas como la tecnología, las humanidades o las ciencias fuera de los espacios formales de clase (Hernández-Leo; Moreno; Soria; Alemany; Atienza; Carrió; Capdevila; Roca; Solé; Atienza; Villanueva; Magre; Baiges; Ruiz; Binefa, 2018). El HackLab es un taller de co-creación de ideas, que tiene un espacio físico situado en las bibliotecas/CRAI (Centro de Recursos para el Aprendizaje y la Innovación) de los campus de Poblenou, Ciutadella y Mar. Por su parte, el HackLab (www.upf.edu/web/hacklab) es también una marca que engloba el apoyo a la comunidad de estudiantes, tanto en las iniciativas que impulsen como en su conexión con iniciativas externas de interés.

Figura 1
Tríptico informativo del HackLab

Figura 2
Cartel de las Segundas Jornadas

Las Jornadas HackLab son eventos que tienen lugar una vez al año para que los y las estudiantes tengan la oportunidad de presentar sus proyectos y ganar premios para subvencionar sus proyectos. Asimismo, es una oportunidad para que nuevas personas conozcan el HackLab y se animen a participar. En estas jornadas, se crea un espacio de *networking* donde los asistentes pueden comunicarse entre ellos y empezar nuevos proyectos juntos.

Las Primeras Jornadas HackLab tuvieron lugar el 1 de febrero de 2017 en el Campus de la Ciutadella de 10-14 horas. En estas Jornadas, participaron diversos alumnos y alumnas que presentaron proyectos de diferentes ámbitos. También tuvo lugar una mesa redonda con los y las participantes en la que se habló sobre distintos temas como la importancia de la interdisciplinariedad en el desarrollo de proyectos o las oportunidades que ofrece un espacio como HackLab. De esta jornada se vio la necesidad de ampliar la difusión, ya que la participación fue escasa (12 estudiantes), así como organizarla en horario no lectivo.

Las Segundas Jornadas tuvieron lugar el 19 de abril de 2018 de 17 a 19h. Con el objetivo de hacer difusión sobre estas Jornadas, se llevó a cabo un concurso a través de la cuenta oficial de Instagram de la Universidad Pompeu Fabra (@upfbarcelona). Otra de las acciones que se llevaron a cabo fue la repartición de trípticos informativos sobre el HackLab en los distintos CRAIs de los tres campus de la universidad *(Fig. 1)*. Además, su pusieron *stands* informativos en los tres campus para dar información sobre el HackLab y las Jornadas de una manera más personalizada. Tanto la convocatoria de este premio como la del reto anterior han sido difundidas a través de las principales redes sociales de la Universidad, así como con posters, carteles y folletos *(Fig. 2)*, además de por la lista de difusión del correo del HackLab donde los estudiantes puedes inscribirse para recibir notificaciones.

Figura 3

Características del Proyecto HackLab

A las Segundas Jornadas, asistieron más de 40 personas. Durante estas, distintos grupos participantes del HackLab hicieron una presentación sobre sus proyectos alrededor de las características/ADN de los proyectos HackLab (Fig. 3). Lo hicieron en unas charlas con el formato *TED talk*, de manera sucesiva y muy dinámicas. Así los oyentes pudieron escuchar charlas de diferentes ámbitos en el plató del campus de Poblenou, ya que es un espacio atractivo para los estudiantes y es una oportunidad de verlo. Seguidamente de las charlas, se hizo la entrega de premios HackLab 2016-2017 y se abrió la convocatoria para los premios HackLab 2017-2018. Finalmente, también hubo una charla por parte de Zacharias Vamvakousis, profesor del Departamento de Tecnologías de la Información y las Comunicaciones de la UPF. Al final de las Jornadas, hubo un espacio de *pica pica* y networking como cierre a la actividad. Después de esta jornada, se detectó la necesidad de repetir nuevamente el formato, pero mejorando la difusión para llegar a estudiantes de grados que no fueran ingenierías.

Actualmente, se están a punto de realizar las terceras Jornadas HackLab, que tendrán lugar el 9 de mayo en el plató del Campus de Poblenou, entre las 17 y 19 horas. Para el plan de difusión de estas Jornadas hemos cambiado algunas actividades. Por ejemplo, decidimos no utilizar los *stands* porque no tuvieron mucha concurrencia en las jornadas pasadas. Este año, en cambio, hemos enviado a diferentes HackLabs a nivel autonómico y nacional información sobre nuestras jornadas, además de contactar con centros de educación secundaria de Barcelona, para así dar a conocer dichas jornadas entre estudiantes de secundaria y bachillerato, posibles futuros miembros de la comunidad universitaria.

Con la intención de fomentar la participación del alumnado de la Universidad en estas Terceras Jornadas, se ha llevado a cabo algunas novedades en la difusión. Como, por ejemplo, hemos incluido un concurso a través de redes sociales de diferente formato que el primero de las Segundas Jornadas.

Además de ese reto, hemos mantenido los Premios HackLab 2018-2019, donde los diferentes grupos de la comunidad HackLab pueden presentar sus proyectos y optar a ganar hasta 400€ en premios. El plazo de inscripción a los premios ha sido del 26 de marzo al 25 de abril, habiendo actualmente prolongado ese período de tiempo hasta el 2 de mayo. Tanto la convocatoria de este premio como la del reto anterior han sido difundidas a través de las principales redes sociales de la universidad, así como con posters y demás carteles, folletos, pantallas de la universidad y correos institucionales de alumnado así como profesorado.

Para las Terceras Jornadas HackLab, contamos con una presentación (*Ted Talks*) de los ganadores de la segunda convocatoria de los premios HackLab, *GameSquare* y también de los dos grupos que obtuvieron menciones, *Postdata no et casis* (ahora *Blanc Trencat*) y *DIY eVOLVERs*. Todos los proyectos pueden consultarse en la web www.upf.edu/web/hacklab. Estos grupos, explicarán sus proyectos y cómo estos han evolucionado en un año. La presentación estará acompañada por unos pequeños vídeos elaborados por el mismo CLIK (Centro para la Innovación en Aprendizaje y Conocimiento) en los que se resume la esencia de cada uno de los proyectos. A continuación, los candidatos a los Premios HackLab 2018-2019 tendrán su oportunidad para presentar sus trabajos, acompañados también por unos pequeños vídeos en formato *elevator pitch*. Más tarde, se procederá a la entrega de premios y un pequeño pica-pica y *networking* final que favorecerá el contacto entre los miembros de HackLab.

2. Conclusiones

El HackLab y sus jornadas, son una apuesta institucional de la UPF por visibilizar y promover el talento del alumnado más allá de las aulas. Se trata de dar alas y aprovechar los proyectos que surgen en las asignaturas o durante su proceso formativo.

Asimismo, es un proyecto, que, aunque no tiene pretensión de llegar a todos los estudiantes, sí que pretende ampliar las disciplinas que participan, ya que por tradición está más arraigado en carreras de ingeniería.

Para finalizar, aunque se han ido mejorando las jornadas hacia un modelo y difusión de más éxito, es necesaria una mayor implicación institucional para ampliar el número de asistentes y su impacto en la comunidad UPF. Las jornadas son una pieza clave, ya que el HackLab funciona muchas veces de modo virtual, por ello un espacio presencial y de encuentro, es clave para los proyectos actuales, pero también para los futuros.

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Providing the Big Picture Makes a Curriculum Jigsaw Puzzle Easier to Navigate

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Abstract

Objective: The University College Cork (UCC) 5-year Bachelors/Masters of Pharmacy (BPharm/MPharm) programme has been extensively mapped to all behaviours in the Pharmaceutical Society of Ireland (PSI) Core Competency Framework (CCF). BPharm/MPharm students and faculty encounter challenges in recognising where and how overarching themes such as patient safety and diabetes are taught horizontally and vertically within the curriculum and how they link to CCF behaviours. The work presented therein addresses this knowledge gap by developing informative programme maps as posters, linking disciplinary themes to academic years, modules, activities and, ultimately, the CCF.

Methods: Information on curriculum components relevant to three themes —patient safety, antimicrobials and diabetes— was collected by interviewing module coordinators and analysing BPharm/MPharm modular content. A0 posters were designed, demonstrating how each theme maps to the CCF *via* modular activities. Posters were critiqued on design, content and usefulness through BPharm/MPharm student and faculty focus groups. Thematic analysis was performed on focus group data.

Results: Students and faculty were positive towards the poster mappings. Maps presented the 'big picture' to stakeholders, highlighting integration of curriculum themes. Students wished to see the visual aids embedded within their curriculum.

Conclusions: Innovative and user-friendly curriculum maps can facilitate the demystification of a curriculum jigsaw puzzle for stakeholders.

1. Introduction

The Pharmaceutical Society of Ireland (PSI) Core Competency Framework (CCF) is the cornerstone of the PSI's programme to reform and inform training and education of undergraduate and practicing Irish pharmacists.[1] The design, content and pedagogical approaches within the UCC 5-year Bachelors/Masters in Pharmacy (BPharm/MPharm) programme is heavily influenced and extensively mapped to the CCF domains, competencies and behaviours. Competency frameworks are intrinsic to pharmacy programmes worldwide [2-5] as well as healthcare professions such as medicine.[6] The PSI stipulate that pharmacy education should deliver an 'integrated experience of relevant science and pharmacy practice'[7], incorporating transdisciplinary integration.[8,9]

Faculty can find it challenging to visualise where and how content is addressed beyond their respective disciplines.[10,11] Pharmacy students can struggle to integrate science and practice [12,13], viewing their curriculum as jigsaw puzzle pieces without the big picture

to understand its gross structure.[10,14] Students may not also appreciate the relevance of competency frameworks to their curriculum [15,16] Curriculum mapping, a visual representation of the curriculum, can be used to understand these concepts.[10] Pharmacy faculties have used mapping for faculty use only to analyse the alignment of curricula with educational outcomes, such as competency frameworks. [11,17-19].

This paper describes the development of user-friendly, systematically designed poster visual aids for all BPharm/MPharm stakeholders, mapping a selection of curriculum themes hierarchically to academic years, modules, modular activities and, ultimately, the CCF. Poster templates were generically designed, potentially allowing the mapping of any aspect of diverse programme curricula to a competency framework.

2. Methods

Three BPharm/MPharm themes (patient safety, antimicrobials and diabetes) were chosen for the curriculum mapping exercise. Data were gathered from diverse curricular sources demonstrating how and when these themes were taught throughout the BPharm/ MPharm syllabus.

UCC Book of Modules (BOM) was the initial information resource interrogated to collate relevant BPharm/MPharm curricular data. Semi-structured, face-to-face, one-to-one interviews were conducted with module coordinators (n = 10) having in-depth insight into the delivery methods of the three curricular themes.

Module coordinator data were cross-referenced against course information on Blackboard®, UCC's virtual learning environment (VLE). The VLE was also used to obtain further curricular activity details of themes discussed during coordinator interviews. Theme data were mapped independently to relevant CCF behaviours by two researchers (SP, WJ). Consolidation of all data generated a single, agreed mapping of each theme's curricular activities to the CCF.

Landscape orientated, A0-size posters (one poster per theme) were iteratively designed using PowerPoint®, illustrating how themes map to the CCF *via* associated modular activities. Language within posters complied with Irish National Adult Literacy Agency (NALA) guidelines.[22]

Draft poster designs were reviewed by BPharm/MPharm students and faculty. Four MPharm student focus groups (n = 8 per group, one group per BPharm/MPharm year), were conducted to critique poster design, content and usefulness. Snowball sampling was employed for focus group recruitment.

Focus group commentaries resulted in amendments to draft poster designs. Second poster drafts were subjected to a fifth focus group comprising of BPharm/MPharm faculty (n = 8), generating further opinions on poster composition, design and usability. The faculty focus group was formed *via* purposive sampling. Following the faculty focus group, poster designs were finalised.

Participants were informed in advance of the focus group structures and purposes and provided with topic guides. Informed consent was acquired according to ethical approval. Focus group proceedings were aurally recorded, anonymously transcribed verbatim, coded and thematically analysed. [20].

3. Results

Overall poster designs comprise of hierarchiacal spider-like diagrams.[21] Design inspiration was primarily obtained by hybridising elements of the London Underground map (*Fig. 1*), map key (*Fig. 2*) and London Heathrow Airport Terminal 5B (*Fig. 3*). *Fig. 4* depicts the final version of the *Patient Safety* poster developed from this work.

Figure 1
London Underground map

Figure 2
London Underground map key

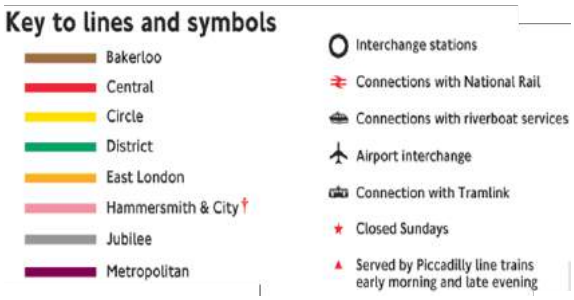
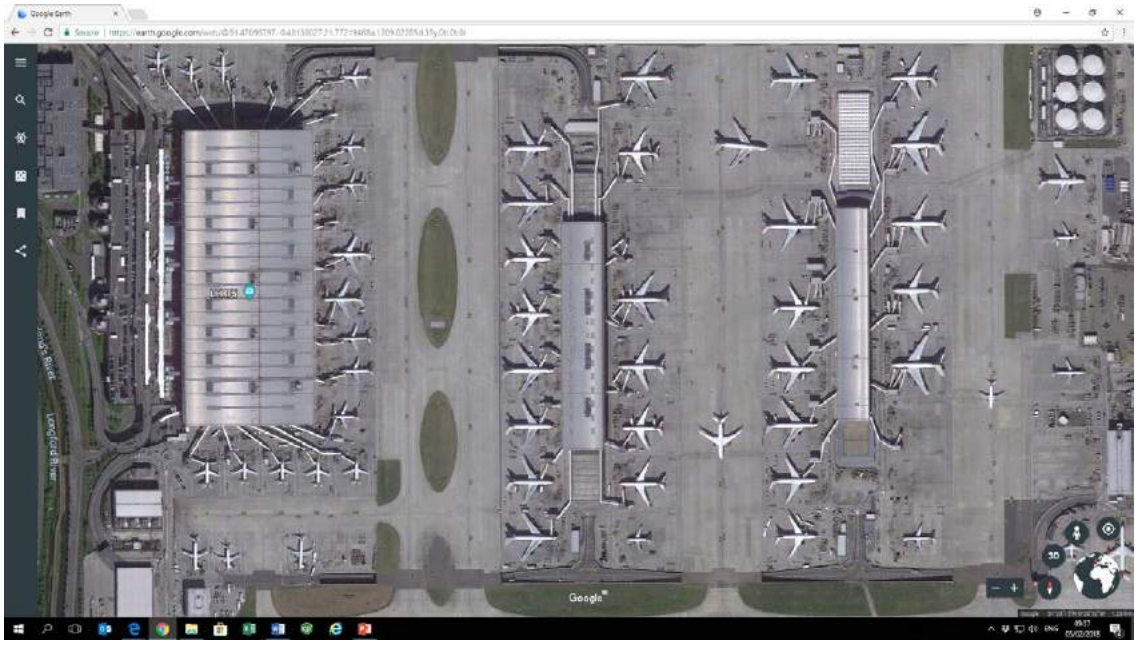


Figure 3
London Heathrow Airport Terminal 5B

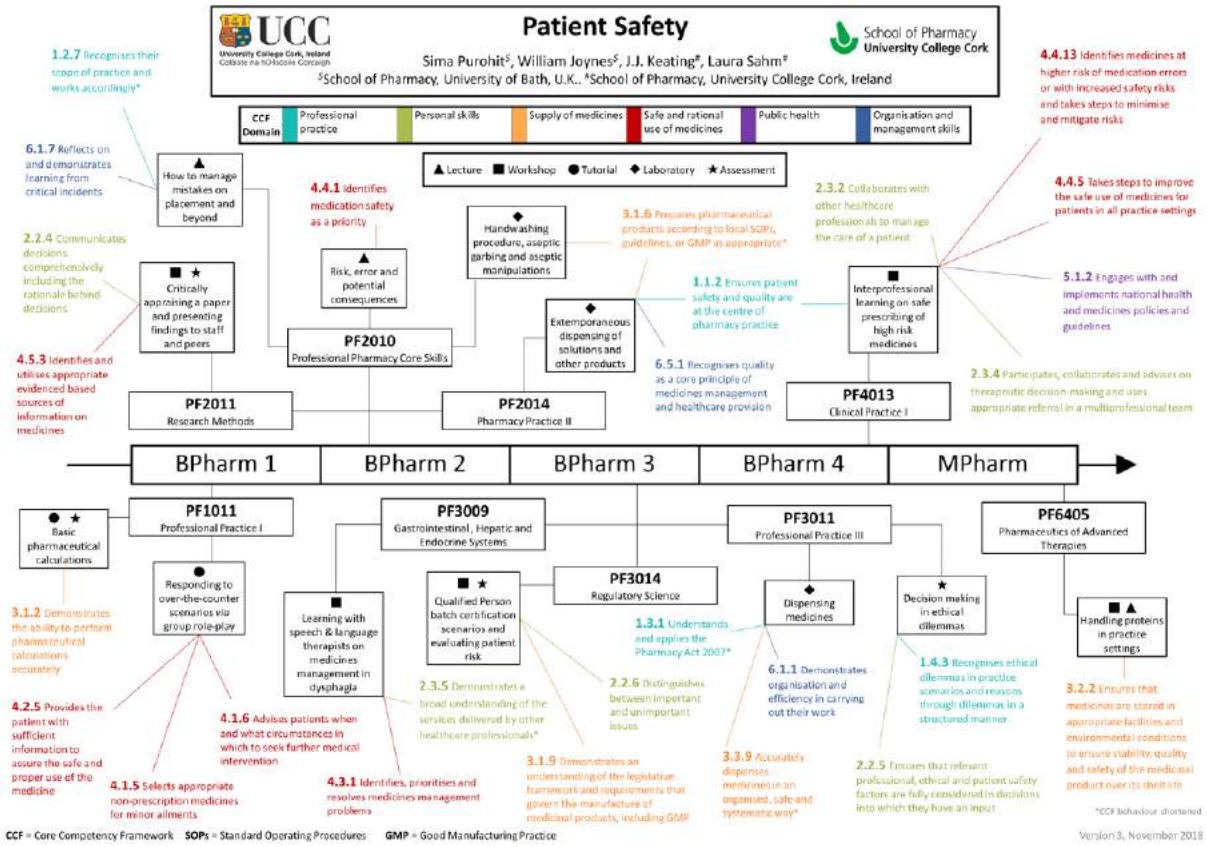


Diabetes and *Antimicrobials* mapping posters were designed analogously. An equally divided central bar within each poster represents progressive BPharm/MPharm programme years (*Fig. 4*). Vertical and horizontal lines primarily branch north and south from this hub, initially leading to modules directly relevant to the pedagogical delivery of patient safety. Module codes and titles are stated within boxes. Secondary vertical and horizontal branching from module boxes directs the viewer to a summary description of one or more modular

activities allied to themes. Black symbols within module activity boxes represent its mode of delivery to students. A symbol key is located under the poster title.

Figure 4

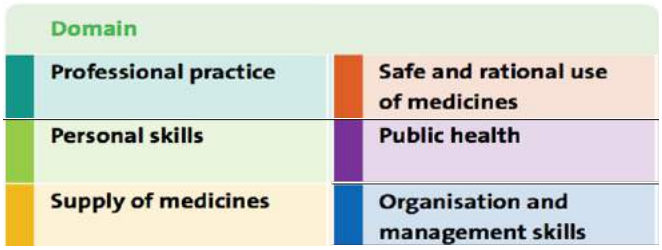
Patient Safety theme poster map – Final Version



Coloured, tertiary, terminal branches radiating from modular activity squares map those elements to relevant CCF behaviours. Each CCF commences with a three-piece numerical identifier. The colour palette and identifier system matches those employed within the CCF Handbook (*Fig. 5*).[1] The CCF domain colour key is located directly under the poster title. Colour is designed to aid users recognition of the CCF domain to which behaviours belong. [21] Abbreviations are elaborated along the poster's southern edge together with the poster version and creation date.

Figure 5

The six domains of the CCF for Pharmacists Handbook [1]



4. Discussion

A number of themes emerged from analysis of focus group data.

Stakeholders were complementary of the intuitive poster design: *"I think looking at the BPharm/MPharm from this point of view is actually kind of refreshing"* (Year4 student). Students and faculty generally found the visual aid easy to navigate [21]: *"I think it's done really well. It is very clear and you can kind of work your way around it easily"* (Year1 student). Poster information was straightforward to understand: *"It brings it back down to a normal person level…it's not all big words…the language used is accessible"* (Year1 student).

Students mostly felt that the posters put learning into perspective. Faculty commented that the posters were a tool to convey teaching relevance [10,11,17-19]: *"it would be very useful for them (students) to actually see these big pictures so they kind of understand…what kind of method we have to our madness, why we do things"*. Posters increased faculty awareness of the BPharm/MPharm curriculum: *"From my perspective, I would never even have realised that diabetes is covered in all these different things"*.

Focus group discussions arising from poster analyses often lead participants to express perceived discrepancies in pedagogical approaches within the BPharm/MPharm curriculum. Students felt that faculty did not clearly highlight curricular integration [9,22,23] whilst faculty argued that students should be capable of recognising integration *"because we're always talking about integration …."*. Overall, stakeholders considered the posters would facilitate understanding of knowledge integration.

Limited by size, posters are not excessively comprehensive. This caused some tension with faculty whose modules were not featured within posters.[10,17] Students also identified poster content gaps: *"It's hard because at the end of the day everything we do is patient safety… it's very hard to narrow that down on to one A0 sheet"* (Year4 student). From the outset, posters were not designed to exhaustively display activities mappable to a theme, instead signposting activities to stakeholders, stimulating self-thought and reflection to discover further curriculum links for themselves. To ensure relevant modules were included in poster mappings, students suggested development of year- or module-focused maps rather than at programme level.

Some students and faculty argued that an A0 poster was an ineffective medium to display information, suggesting development of interactive, online visual aids. Hard copy poster mappings can become obsolete as the BPharm/MPharm curriculum evolves. [19] Online accessible maps could incorporate additional functionality, allowing further elaboration and exploration of data.[10]

This study demonstrates that innovative and user-friendly poster visual aids can deepen understanding of the complex interplay between curricula, integration and a competency framework and help demystify a curriculum jigsaw puzzle.[17] The UCC School of Pharmacy is actively developing further curricular BPharm/MPharm maps using the poster template described herein.

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El Aprendizaje basado en proyectos como estrategia didáctica para superar las fronteras del aula

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Resumen

Esta comunicación aborda la aplicación de la metodología de Aprendizaje Basado en Proyectos (ABP) como estrategia de renovación de la asignatura *Redacción Ciberperiodística* por parte de los profesores/as que impartieron la materia durante los últimos cursos en los grados de Periodismo, Publicidad y Comunicación Audiovisual de la Universidad del País Vasco (UPV/EHU).

Dicha asignatura parte de los conocimientos adquiridos en las materias de primer curso *Redacción Informativa en Prensa* (primer cuatrimestre) y *Géneros Informativos* (segundo cuatrimestre); y continúa con la enseñanza de una serie de destrezas redaccionales complementarias a las de los medios impresos y audiovisuales. Concretamente, la asignatura *Redacción Ciberperiodística* se configura como una aproximación a los fundamentos de la estructura del mensaje periodístico en Internet y la especificidad de los géneros periodísticos en los nuevos entornos multimedia. A lo largo del cuatrimestre se explican los conceptos básicos para una escritura eficaz en la red. Además, también se abordan las técnicas de redacción en Internet para organizar textos de carácter hipertextual, de carácter multimedia, incorporar enlaces en los contenidos, y conseguir que los textos publicados tengan una buena visibilidad en los buscadores.

El ABP constituye una estrategia didáctica, en la que los estudiantes, organizados en grupos, desarrollan proyectos basados en situaciones reales (Bender, 2012; Patton, 2012). Planean, desarrollan y evalúan proyectos que cruzan las fronteras del aula y tienen como objetivo lograr un impacto en la vida real.

Actualmente, las empresas y organizaciones precisan de nuevas metodologías de actualización, y de profesionales con las capacidades y habilidades necesarias para la resolución de problemas, la toma decisiones, la capacidad de trabajo colaborativo y la adaptación flexible a los cambios rápidos que se producen en la sociedad de la información (Cenich y Santos, 2005). Dichas necesidades fuerzan a preparar a los futuros profesionales requiriendo de metodologías innovadoras y participativas relacionadas con el mejoramiento de la calidad de la enseñanza y el aprendizaje.

En la presente investigación, de carácter exploratorio, se utiliza el cuestionario como herramienta para identificar las apreciaciones que el alumnado ha experimentado en esta experiencia de ABP.

Abstract

This communication addresses the application of the Project-Based Learning (PBL) methodology as a new strategy for the subject *Cyber-Journalistic Writing*, aimed at the teachers who delivered the subject during previous sessions of the degrees in Journalism, Publicity and Audiovisual Communication at the University of the Basque Country (UPV).

Said subject draws on the knowledge acquired from subjects taught during the first year: *Informative Writing in the Press* (first term), and *Information Genres* (second term). It follows on from this by teaching a set of writing skills which complement those relevant to print and audiovisual media. Specifically, the subject *Cyber-Journalistic Writing* gets closer to the fundamentals of the structure of the journalistic message online and the specificity of journalistic genres in new multimedia environments. The basic concepts of effective writing for the Internet are explained throughout the term. The subject also addresses Internet writing techniques for organising hypertext and multimedia, for incorporating links within the content and for ensuring that published texts have a good presence in search engines.

PBL is a teaching strategy in which the students, organised into groups, develop projects based on real situations (Bender, 2012; Patton, 2012). They plan, develop and evaluate projects which go beyond the classroom and aim to have an impact in the real world.

Businesses and organisations nowadays need new and up-to-date methodologies and professionals with the capacity and skills necessary for solving problems, making decisions, working collaboratively and adapting flexibly to the rapid changes which take place in the information society (Cenich y Santos, 2005). Future professionals must be prepared to meet these needs, which in turn requires innovative and participative methodologies which improve the quality of teaching and learning.

The research is of exploratory type and the questionnaire was used as tool for collecting information about about the appreciations that the students have experienced in this Project-Based Learning (PBL).

1. Introducción

Los cambios que se están dando en la sociedad y en la educación superior en los últimos años exigen innovar las metodologías docentes, para que el estudiante vaya más allá de la memorización de conceptos o ideas y pueda realizar análisis de forma crítica o responsable (Mujica, 2012). Más aún, cuando esos cambios se dan igualmente en el desarrollo de la profesión a la que aspira poder llegar nuestro alumnado.

Más allá de herramientas y nuevas tecnologías, se hace necesario aplicar itinerarios formativos acordes con los cambios sociales y culturales derivados de lo tecnológico y lo digital. Este nuevo contexto posibilita una forma de trabajar, por parte del estudiante, orientada a conseguir metas (Himanen, 2004) y su mayor implicación en las tareas (Del Moral *et al.*, 2014), asumiendo así la responsabilidad de su aprendizaje y al mismo tiempo manteniendo la motivación a través de distintas estrategias (Wolters, 1998).

2. Oportunidades para la enseñanza del periodismo

La enseñanza y el estudio del Periodismo deberían suponer una continua adaptación al cambiante contexto digital que inició su andadura hace ya 25 años con la aparición de los primeros medios online y el desarrollo de nuevos perfiles profesionales. Sin embargo, una de las críticas más repetidas por el alumnado egresado, es que los contenidos de la carrera, excesivamente teóricos, no contemplan los cambios ni responden a las demandas sociales, generando graduados con escasas competencias para desarrollar una labor profesional competente.

La historia reciente no sólo ha dado muestras de las nuevas posibilidades de captación, recepción y distribución del mensaje, sino que además ha abierto las puertas a la experimentación e innovación narrativa (Bernal Triviño, 2014). Los nuevos profesionales se ven así en la necesidad de desarrollar nuevas aptitudes, conocimientos y habilidades para poder adaptarse a los nuevos tiempos.

En el caso del Periodismo, ya hay quien demanda un vuelco en la formación de los futuros profesionales de los medios (Montiel y Villalobos, 2005). Los cambios en las tecnologías, la emergencia de nuevos actores comunicativos y la modificación de las dinámicas de producción informativa exigen un nuevo modelo de profesional (Acosta *et al.*, 2017: 193).

Tal y como recogen Freire y Schuch (2010), el aprendizaje del Periodismo debería modificarse para ser capaz de afrontar los problemas emergentes que exceden las disciplinas tradicionales e integrar los procesos educativos informales. Se trata de que los alumnos empiecen a trabajar competencias que serán importantes en su labor profesional como periodistas.

3. El aprednizaje basado en proyectos en la docencia de la asignatura *redacción ciberperiodística*

El Aprendizaje Basado en Proyectos (ABP) es una estrategia didáctica basada en el diseño de actividades interdisciplinares en las que los estudiantes deben ofrecer una aplicación práctica en el mundo real más allá de los límites del aula (Nadelsson, 2000). Son proyectos basados en simulaciones de situaciones o problemas reales, creando una conexión entre el mundo académico y el laboral.

Durante los últimos cursos los profesores/as que imparten la asignatura *Redacción Ciberperiodística* de los grados de Periodismo, Publicidad y Comunicación Audiovisual de la Universidad del País Vasco (UPV/EHU) introdujeron la metodología de ABP como renovación de la estrategia docente de la materia.

Dicha asignatura parte de los conocimientos adquiridos en materias de primer y segundo curso; y continúa con la enseñanza de una serie de destrezas redaccionales complementarias a las de los medios impresos y audiovisuales. Concretamente, la asignatura *Redacción Ciberperiodística* se configura como una aproximación a los fundamentos de la estructura del mensaje periodístico en Internet y la especificidad de los géneros periodísticos en los nuevos entornos multimedia. A lo largo del cuatrimestre se explican los conceptos básicos para una escritura eficaz en la red.

4. Planificación y estrategia metodológica

Al comienzo del curso se le solicitó al alumnado que desarrollase por grupos de 4 personas un proyecto de creación de un medio digital que respondiese a los objetivos de la asignatura: que el estudiante aprendiese a planificar y redactar de forma 'eficaz' informaciones periodísticas para medios online y que aprendiese a producir sus propios contenidos multimedia. En general, se trató de que el alumnado interiorizase las destrezas necesarias para ejercer la profesión de periodista en Internet, enseñándole a resolver los problemas propios de la tarea informativa de forma creativa.

La asignatura se dividió en dos partes. El programa teórico se desarrolló cada semana en el aula (dos horas) y se basó en la clase magistral, donde se abordaron tanto las bases teóricas de la materia como las características del lenguaje periodístico en Internet, las particularidades de los géneros periodísticos en los nuevos entornos multimedia o cómo escribir para buscadores y la importancia del SEO y la analítica web.

Todo este proceso de aprendizaje teórico se complementó con la puesta en práctica de los conocimientos adquiridos en la sala multimedia. Se trató de aproximar al estudiante a la noticia hipermedia en los medios online y a otros géneros como el reportaje multimedia o las particularidades de la crónica online. Estas partes prácticas del proyecto se desarrollaron en la sala de ordenadores (dos horas semanales) para favorecer el aprendizaje y permitir apreciar los diferentes niveles de desarrollo competencial en el proceso de formación del alumnado. Los estudiantes redactaron los contenidos bajo la constante supervisión del profesor.

5. Satisfacción del alumnado

Poco antes de concluir su formación, se solicitó a los estudiantes que valoraran la actividad llevada a cabo.

La muestra de estudio estaba formada por los estudiantes procedentes de los tres Grados (Periodismo, Comunicación Audiovisual y Publicidad) en los que se imparte la asignatura de *Redacción Ciberperiodística*, tanto en los grupos de castellano como de euskera.

El objetivo primordial de esta encuesta consiste en informar al profesorado sobre cómo son percibidos por el alumnado en relación con el desempeño docente en la asignatura de *Redacción Ciberperiodística*:

- En cuanto a la planificación de la docencia, un 80% reconocía que se adaptaba a la naturaleza de la asignatura. En este mismo apartado, prácticamente un 80% de los estudiantes consideraron de manera muy positiva los recursos utilizados por el profesorado, al igual que las actividades prácticas propuestas por éste.
- En relación a la metodología docente basada ABP, un 70% del alumnado opinó que ésta favorecía el trabajo en equipo, apoyado ello por las condiciones de las salas multimedia (prácticamente un ordenador por alumno). Ese nivel de satisfacción subió hasta el 75% cuando se preguntaba sobre la motivación al alumnado para que se interesara por su proceso de aprendizaje en la asignatura de *Redacción Ciberperiodística*; y hasta el 90% cuando se les consultaba sobre si se estimulaba la participación.
- Por lo que respecta al desarrollo de la docencia, un 80% de los alumnos opinó que el profesorado contribuía al desarrollo de un buen clima de trabajo, y un 95% que atendía adecuadamente las consultas que se le plantean durante la realización de sus proyectos.
- En cuanto a la interacción con el alumnado, un 80% de los estudiantes creían que el profesorado tiene en cuenta la opinión del alumnado, tanto para el desarrollo de las clases magistrales como de las prácticas.

6. Conclusiones

La introducción de la metodología de ABP, como renovación de la estrategia docente de la materia se ha visto facilitada por la naturaleza práctica de la asignatura de Redacción Ciberperiodística y ha permitido que los alumnos sean partícipes desde el primer momento de su propio proceso de aprendizaje y que reflexionen sobre las consecuencias de los contenidos que publican.

Y es que todos los contenidos de cada proyecto se publicaron en tiempo real en la página web de los mismos creada con el software Wix al efecto. Desde el comienzo, adquirieron dimensión pública compitiendo en Internet con los generados por los periodistas profesionales y con posibilidades de lograr parecida repercusión. De esta forma, la exposición pública de sus trabajos inéditos reforzó la responsabilidad del alumnado en la elaboración de los contenidos y aumentó su motivación para lograr el mejor resultado final posible, lo que le dio un valor añadido al proceso de enseñanza.

En general, los grupos confeccionaron proyectos periodísticos sólidos, bien documentados, con fuentes de primer orden y con un uso creativo de la multimedialidad, interactividad e hipermedialidad.

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El desarrollo de la indagación y la investigación en los estudiantes del Grado en Derecho mediante el Trabajo Fin de Grado: aprendizajes obtenidos de una experiencia colectiva

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Resumen

La comunicación propuesta relata un proyecto de intervención en el aula desarrollado en la Facultad de Derecho de la Universidad del País Vasco/Euskal Herriko Unibertsitatea para mejorar la adquisición de competencias vinculadas al Trabajo Fin de Grado. Se describe su génesis, planteamiento e implementación, como punto de partida para un debate crítico sobre la materia.

Abstract

Proposed paper relates an intervention project in classroom developed at the Faculty of Law of the University of the Basque Country/Euskal Herriko Unibertsitatea in order to improve the acquisition of skills linked to the Final Degree Project. Its genesis, approach and implementation are described, as a starting point for a critical debate on the subject.

1. La génesis del proyecto de intervención en el aula del grado en Derecho

El Trabajo Fin de Grado (TFG), integrado en el cuarto módulo del Grado en Derecho ("Especialización, Investigación y Práctica del Derecho") de la Facultad de Derecho de la Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU), persigue asentar competencias genéricas y transversales de la titulación, entre las que cabe destacar: (1) capacidad de análisis crítico, interrelación e integración de conocimientos jurídicos; (2) comunicación oral y escrita; (3) capacidad de síntesis y exposición, con utilización de técnicas de argumentación y razonamiento crítico y (4) gestión del propio proceso de aprendizaje hacia una formación integral y respetuosa con los valores democráticos. Luego, la investigación individual realizada por el estudiante se convierte en la forma de trabajar competencias básicas y transversales del Grado en Derecho.

No obstante, nuestra experiencia de más de 5 años en el nuevo plan de estudios de Derecho, nos lleva a entender que "la memoria, estudio, informe o dictamen original vinculado a alguna/s de las materias desarrolladas en el Grado" (art. 1 Reglamento de la Facultad de Derecho de la UPV/EHU para la elaboración y defensa de los TFG), que debe realizar el estudiante para culminar el Grado en Derecho, se ha convertido, para muchos, en un trámite muy duro de superar: el alumnado no se ve preparado para realizar el trabajo de investigación del final de su carrera. Por ello, desde el curso 2018/2019, un grupo de 16 profesores y profesoras del Grado en Derecho estamos trabajando conjuntamente en un Proyecto de Innovación Educativa (en lo sucesivo, PIE) ("Intervención pluridisciplinar en el Grado en Derecho para fomentar el aprendizaje activo y autónomo dirigido a la confección del Trabajo de Fin de Grado") avalado por el Vicerrectorado de Innovación, Compromiso Social y Ac-

ción cultural de la UPV/EHU. Concretamente, nos hemos planteado abordar conscientemente en el aula, en las distintas asignaturas del grado, las competencias vinculadas al TFG, marcando pautas de mejora, en el ámbito extraescolar, mediante el aprendizaje activo y autónomo, para obtener una preparación adecuada para que el alumnado pueda afrontar la investigación jurídica y posterior exposición pública que conlleva el TFG, con tranquilidad y garantías.

2. La indagación e investigación individual como instrumento para obtener nuestro objetivo

La experiencia que traemos a EuroSoTL se diseñó con el objetivo principal de realizar de una tarea coordinada entre profesores y profesoras de todas asignaturas del Grado en Derecho de la UPV/EHU para potenciar el aprendizaje activo y autónomo del estudiantado que le permita superar con éxito el TFG, garantizando así la obtención de las competencias que se vinculan a los estudios jurídicos. Luego, la indagación e investigación individual y propia del alumno, con ayuda de los docentes, se convierte en elemento eje de nuestro proyecto.

3. El aprendizaje activo y autónomo en cuanto fuentes pedagógicas inspiradoras

En el marco de lo que se conoce como aprendizaje activo (*active learning*), entendemos imprescindible utilizar estrategias en nuestra docencia que involucren activamente al estudiantado, para que obtenga una comprensión más profunda de los contenidos, que les permita desarrollar un pensamiento crítico y habilidades para solventar problemas (análisis, síntesis, argumentación y defensa), al tiempo que les motivemos, y animemos a la interacción y trabajo con sus semejantes. Entendemos necesario, al efecto, resignificar los roles de los propios estudiantes y el nuestro. Tenemos que configurar, asimismo, un nuevo y doble concepto del lugar de trabajo: aula o espacio ajeno a ella.

Como fuente inspiradora de nuestro proyecto, totalmente vinculado, deviene igual de importante lo que se viene llamando aprendizaje autónomo, autoaprendizaje o estudio autodirigido (*autonomous learning, self-learning, self-guided study*). A su luz, es necesario trabajar con los y las estudiantes la capacidad de detectar déficits en el propio conocimiento y superarlas mediante la reflexión crítica y la elección de la mejor actuación al respecto.

4. Fases del Proyecto de Intervención en el Aula

En desarrollo de nuestro PIE, lo primero que hemos hecho es constatar el problema: la falta de preparación del alumnado de Derecho para afrontar la investigación que conlleva el TFG, o en otros términos, la falta de dominación de las competencias básicas y transversales del Grado en Derecho. Lo hemos hecho mediante encuestas y entrevistas personales, tanto al alumnado, como al equipo docente de la Facultad. Hemos recogido nuestras conclusiones en un informe.

A continuación, y fruto de reuniones del equipo docente implicado en el PIE, hemos articulado una serie de actividades para, apoyados en el aprendizaje activo y autónomo, trabajar en todas las materias del Grado en Derecho conscientemente las competencias que

requiere el TFG. Así, las asignaturas de primero (Teoría del Derecho, Derecho Romano e Historia del Derecho) han programado tareas de síntesis y esquematización de sentencias y textos jurídicos básicos, presentes y pasados, en grupo e individualmente. Los docentes encargados de las materias de segundo curso (Introducción al Derecho Procesal, Derecho Administrativo, Derecho Internacional Público y Derecho Constitucional), por su parte, han ideado dinámicas para que el alumnado redacte, en grupo, textos jurídicos relativos a cuestiones controvertidas actuales (independencia judicial, déficit y servicios públicos, guerras olvidadas, modificación constitucional…) y que los defienda en un debate público. De la misma manera, en las materias del tercer curso (Derecho Procesal Civil, Derecho Procesal Penal, Derecho Penal, Derecho Laboral y Derecho Internacional Privado) se ha decidido aprovechar las clases prácticas de las mismas para que el estudiantado configure escritos de posiciones diversas y textos judiciales, en grupo e individualmente. A todos ellos, les seguirán defensas públicas, individuales y grupales, y los consiguientes debates. Por último, los docentes encargados de la impartición de las materias del cuarto curso del Grado (Derecho Financiero Derecho Civil IV y Derecho Mercantil) se han comprometido a realizar con sus alumnos y alumnas, el primer cuatrimestre, y antes de realizar el TFG, en el transcurso de las últimas asignaturas del Plan, breves trabajos de investigación y defensa pública sobre cuestiones no estudiadas en el aula, pero directamente relacionadas con ellas, sobre temas planteados por el propio alumnado.

En este momento, la mayoría de docentes implicados en el PIE está implementando las actividades coordinadas diseñadas, recogiendo en los correspondientes informes su resultado.

5. Conclusiones

El desarrollo del proyecto coordinado ideado en su estado actual —plena implementación— nos permite inferir:

1. Tal y como sospechábamos el equipo docente implicado en el PIE, la intervención en el aula propuesta era necesaria. Las encuestas realizadas al alumnado han venido a demostrar la inseguridad de este colectivo para afrontar el TFG.
2. Más de 5 reuniones del equipo docente implicado y abundantes discusiones han permitido diseñar un plan de actuación coordinado para trabajar en todas las asignaturas del Grado en Derecho y en todos los cursos las competencias básicas del jurista (capacidad de análisis crítico, interrelación e integración de conocimientos jurídicos; comunicación oral y escrita; capacidad de síntesis y exposición, con utilización de técnicas de argumentación y razonamiento crítico y gestión del propio proceso de aprendizaje hacia una formación integral y respetuosa con los valores democráticos).
3. El aprendizaje activo y autónomo es, a juicio de todos los docentes implicados, un recurso pedagógico apto para trabajar en el aula y fuera de él las competencias básicas del jurista.
4. El equipo docente, igualmente, se percata de la dificultad de evaluar el PIE en su conjunto, por estar desarrollándose, al mismo tiempo, en todos los cursos y asignaturas. Su duración (2 cursos escolares) impide hacer un seguimiento de conjunto, es decir, ver la mejora del alumno de primero cuando llega a cuarto y le toca confeccionar y defender su TFG. Por ello, hemos acordado hacer evaluaciones individuales y ponerlas en común, sin perjuicio de solicitar la prórroga del PIE que pueda dar lugar a una evaluación global y de conjunto.

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Geología y «vida real»: una nueva iniciativa docente para el alumnado de primer curso en la UPV/EHU

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Resumen

El presente trabajo recoge el desarrollo de una nueva iniciativa docente destinada a acercar el mundo profesional al alumnado de primero del Grado en Geología de la UPV/EHU. La experiencia aportada por personas expertas en campos tan diversos como el medio ambiente y la conciencia social, la divulgación científica o el geoturismo, asociada a actividades complementarias, ha permitido mejorar su conocimiento de esta ciencia y la motivación para su estudio.

Abstract

The present work includes the development of a new teaching initiative aimed to bring the professional world closer to the students of the first course of the Degree in Geology at the UPV/EHU. The experience contributed by experts in fields as diverse as the environment and social conscience, scientific divulgation or geotourism, associated with complementary activities, has allowed to improve their knowledge of this science and the motivation for studying it.

1. ¿Qué sabíamos sobre el alumnado de primer curso?

Cuando comenzamos esta experiencia (a mediados del curso 2016/17) sabíamos que la nota media de acceso al Grado en Geología de la Universidad del País Vasco UPV/EHU era baja (6.8-8.0), que no era la primera opción de estudio para aproximadamente la mitad de las personas matriculadas y que los resultados académicos eran mejorables (tasa de rendimiento < 50%, tasa de abandono en torno al 34%). Dada la escasa atención que se dedica a esta ciencia en la enseñanza primaria y secundaria [1, 2], sospechábamos también que buena parte del alumnado quizás no conocía muy bien las posibilidades temáticas y profesionales que ofrece la Geología, lo que podía influir negativamente en su motivación. Para reforzar este factor, condicionante básico en los procesos de enseñanza-aprendizaje [3, 4], necesitábamos, en primer lugar, conocer mejor a nuestr@s estudiantes.

2. ¿Qué nos han contado ELL@S?

A lo largo de los cursos 2016/17 y 2017/18 realizamos una serie de encuestas a l@s estudiantes de primero de Geología (que en algunos casos ampliamos al resto del grado y a primero de Biología, para tener referencias comparativas). En ellas observamos que la mayoría del alumnado recién incorporado comparte una clara preferencia por el contacto con la naturaleza y los trabajos prácticos (especialmente de campo), así como una buena disposición a viajar. Curiosamente, estos factores coinciden con los mencionados como puntos fuertes de la Geología para explicar la alta satisfacción mostrada por el alumnado británico de esta disciplina (https://www.theguardian.com/education/2008/sep/11/geology.students). También tienen en común la preocupación por el Medio Ambiente, el interés por el campo de

la investigación (lo que parece revelar una cierta curiosidad) y el convencimiento de que la Geología es una ciencia desconocida a nivel social (lo que puede proyectar su propio desconocimiento).

Ante el reto de reforzar el conocimiento de la Geología por parte de l@s estudiantes y fomentar su implicación personal en su propia formación, se considera que disponer de una percepción adecuada del valor de lo que se estudia en relación a una perspectiva futura extensa (desarrollo laboral, responsabilidad social), conectándolo además con aspectos de la propia vida (como los expresados en las encuestas), suele ir acompañado de un incremento en la motivación, un aprendizaje más profundo, una mayor persistencia y un mejor rendimiento [5, 6]. De ahí que decidiéramos incorporar a la docencia de primer curso la experiencia directa de profesionales de distintos campos de la Geología, con el propósito de que aportaran una visión realista y plural de su relevancia y las oportunidades que ofrece su práctica.

3. Geología y "vida real"

Las charlas se desarrollaron en el curso 2017/18 como parte de los Miércoles Culturales de la Facultad de Ciencia y Tecnología, estando abiertas a todo el colectivo universitario. Cada una llevaba asociada una actividad complementaria a realizar por el alumnado de primero:

— "Sobre la Geología, el Medio Ambiente y las personas" M. Monge, Reserva de la Biosfera de Urdaibai, Gobierno Vasco.

El reto consistía en buscar noticias de prensa relacionadas con la Geología. Los resultados ofrecieron una muy buena panorámica de su relevancia social, ya que incluían temas tan variados como los riesgos geológicos, el medio ambiente, la paleontología, los recursos minerales, etc.

— "Comunicar Geología: ni el mejor guion de Hollywood" A. Hilario, Director Científico del Geoparque de la Costa Vasca.

Centrada en nuevos campos laborales (divulgación científica, geoturismo), al concluir la charla se les pidió que enviaran fotografías representativas de la presencia de la Geología en sus vidas. El éxito de la reflexión se vio evidenciado por el hecho de que la mayoría remitió fotografías personales.

— "La Geología no es una ciencia. Sheldon Cooper, 2011" I. Gárate y O. Suárez, investigadores UPV/EHU.

Incorporar la investigación a la docencia nos permitió abordar aspectos tan interesantes como la importancia del esfuerzo colectivo, la responsabilidad social, la interdisciplinaridad o la perspectiva de género [7, 8]. En este caso la tarea consistía en elegir una persona de la historia de la Ciencia y explicar muy brevemente el por qué de esa elección. Señalar que la mitad de las contribuciones recibidas fueron sobre mujeres científicas.

— "Enseñando ciencia... y conciencia". L. Yllescas, profesora de Enseñanza Media y coordinadora de Ecologistas en Acción.

Dada la creciente influencia de los seres humanos en las dinámicas terrestres, resulta especialmente oportuno incorporar la dimensión ética a la formación en Geología [9]. Enlazando con la idea de que una sociedad responsable precisa de una buena educación científica

de la ciudadanía, se les pidió que eligieran la cuestión geológica que les gustaría explicar a las personas más cercanas, reconociéndoles así el protagonismo en la transmisión del conocimiento que están adquiriendo.

— "Aventuras de un geólogo por el mundo". M. Erkiaga, Global Ventures Manager, Repsol.

La pregunta realizada, sobre el área de la Geología en la que les gustaría trabajar, dio pie a una reflexión sobre la importancia de su actitud en relación a la formación que están recibiendo y la complementaria, así como sobre las buenas prácticas profesionales.

Con el propósito de reconocer el esfuerzo realizado por las personas participantes y materializar un recurso que fomentara las conversaciones sobre Geología al margen de las horas de clase, con todas las contribuciones recibidas se realizaron una serie de murales que fueron expuestos en las aulas (Fig. 1).

Figura 1

Ejemplo de montaje de aportaciones recibidas y exposición en el aula

4. ¿Cómo valoramos la experiencia?

A pesar de lo limitado de la experiencia, tenemos razones para valorarla positivamente: el 67% del alumnado afirma que su interés por la Geología ha aumentado a lo largo del curso (frente al 25% del año anterior), valoran mejor su utilidad social (el 95% la consideran alta, frente al 55% previo) y han pensado menos en dejar la carrera (17% frente al 62%). De hecho, el número de alumn@s que han abandonado en primero ha sido inferior al 10%. Por lo tanto, consideramos que puede ser interesante incorporar esta experiencia, de un modo continuo (aunque revisable), a la práctica docente.

Agradecimientos

Expresamos nuestro agradecimiento al alumnado y al profesorado que ha participado en esta experiencia, a las personas que nos transmitido su pasión por la Geología en forma de charlas y a la UPV/EHU por la concesión del Proyecto de Innovación Educativa "Diagnóstico de orientación vocacional en estudiantes de primero de Geología: estrategias de fortalecimiento y motivación" (HBT 35) que ha permitido llevarla a cabo.

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Gamification in the teaching-learning process of chemistry: design of new resources

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Abstract

In this work, a playful tool to improve science understanding between students is presented. The main objective is to address one of the deficiencies observed in their previous training in chemistry: the chemical formulation. The lack of basic chemistry knowledge, which the students should have acquired in lower stages of the education system, that is, during secondary and/or bachelorship studies, is one of the principal causes of the low student performance rate in the Degree in Chemistry. In this sense, trouble with the nomenclature and formulation of chemical substances is emphasized, since it avoids the normal development of the first-year subjects at university. In addition, it continues manifesting itself in superior academic courses in many occasions. Taking into account the 2019 declaration by UNESCO as the International Year of the Periodic Table, the application of gamification in order to contribute to solve the problems exposed is intended in secondary classrooms, as well as in students of the Degree in Chemistry. To this end, a card game about inorganic formulation and nomenclature in order to reinforce its basic norms and some other curiosities about elements has been developed. In this way, they can both learn and revise basic concepts of chemical formulation and periodic properties in a playful manner. The game has been applied to a representative sample of students of different levels and subsequently evaluated.

1. Introduction

We actually live in a period of rapid social, economic and cultural changes, in which it has been verified that educational institutions are not in all cases adapting at the same speed to the new reality in which current students live [1]. This situation causes a crisis in the traditional education, where the absence of motivation of the students is being showed in the low academic performance at different educational levels, specifically in Spain, but also in several countries around the world. In addition, it is important to highlight that, to date, the aforementioned crisis is also reaching the university classrooms. In this way, we are now faced with the need of teachers to expand their responsibilities to not only simply transmitting their knowledge to students, but also to carry out innovative actions and use resources and new teaching strategies that allow them to develop the teaching-learning process of their students with success [2] as well as ensuring the correct acquisition of skills by students [3] following the corresponding recommendations of curricula.

The game has been used in education for a long time. In addition, it has been studied in depth that the use of the game in this field is a useful tool with the aim of achieving in the same proportion the objectives of both entertaining and educating. With the incorporation of the game in classrooms of different levels, it is intended to improve the results obtained by pre-university and university students by the very advantages that it offers in education.

This incorporation of the game as a learning element has been recently named as *gamification*, with some of the existing works related to its application at higher education institutions [4].

The term *gamification* is then a relatively new word that has been defined by Zichermann and Cunningham as "the thought process of games and game mechanics to involve users and solve problems" [5,6]. This affects, although not limits, to the use of new technologies as a platform for the design of virtual games that motivate intrinsically and extrinsically the students. In this case, the term is used to designate the use of traditional-court games in the classrooms. In this way, it can be established that the new generations of students, who have grown up surrounded by technology, are also able to use and learn chemistry throughout the use of traditional games. Between them, there can be mentioned board games and, among them, card games.

2. Methodology

2.1. Student sample

The card game has been applied to date to a representative sample of first-year students of the Degree in Chemistry who are studying at the University of Valencia.

2.2. Data collection and analysis

Once the game was applied with the aforementioned sample of students, two questionnaires were prepared (one of them addressed to teachers and the other to the students involved in the action), where the degree of agreement or disagreement with different assertions about the game could be indicated by using a 1 to 6 Likert score scale about some items related to the developed game. Between them, there can be highlighted: fun of the game, difficulty, possibility of using it in the future or utility to strengthen the knowledge about formulation. In addition, a section was included where suggestions and other written comments could be made in this regard.

3. Results and Discussion

From the prepared questionnaires, with the objective of knowing the opinions of both the students and the teachers about the developed card game, it was possible to conclude that both figures seemed to think about the game as a useful and innovative tool to practice and review inorganic formulation and their related concepts. In this way, chemistry, its teaching-learning process and its lessons can be turned in a much more entertaining and comprehensible process.

Specifically, some of the highlights extracted from the opinions received are:

— The card game is a funny game. In addition, it turns in a more dynamic game as more people participate in it.
— The card game can help improving the knowledge on inorganic formulation of students. However, this can be achieved by using it on several occasions and not as something sporadic in isolated class sessions.
— The game can be used to study.

— Some students say, it would be fun to use the game with friends, both for simply as an entertaining tool and to study this part of the chemistry subject.
— In spite of everything, it is emphasized that in a first moment the rules of the game are difficult to understand. However, it is true that after a pair of games these are understood with more agility.

Other comments included congratulations on the design of the game, since it allows memorizing data and curiosities about the Periodic Table of the Elements in a practically unconscious manner. For example, the fact that each group of elements is associated with a different color makes it easier for students to associate elements and their properties with each other, so that they can classify them more easily in the future. In addition, the rest of the information that can be found in the cards (electronic configuration, atomic number and molecular weight, valences and other curiosities about each of the elements) help the students' learning about the properties of the elements in an unreflexively way.

Finally, wild cards, each of them assigned to a scientist who made an interesting contribution to chemistry and which include different inquisitiveness about his or her life, have received in the same way positive comments. Among the observations made in the questionnaires, there can be highlighted that they help to contextualize the chemistry subject through its relationship with history, in a general way, and the history of science, in a particular way.

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Programa de iniciación a la INvestigación EDucativa

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Resumen

En este trabajo presentamos el programa de iniciación a la INvestigación-acción EDucativa (INED), dentro de la convocatoria anual de acciones formativas para el profesorado universitario que organiza el Instituto de Ciencias de la Educación (ICE) de la Universitat Politècnica de València (UPV). Este programa responde a la necesidad del profesorado que parte con un bagaje profesional y requiere de formación para avanzar en el proceso de profesionalización de la docencia, alineado con el concepto de scholarship y el movimiento generado a su alrededor. El programa se formula como una investigación-acción para promover la mejora de los enfoques formativos del profesorado en la educación superior. Los objetivos pretenden experimentar una propuesta formativa innovadora para el profesorado universitario en un contexto educativo científico-técnico; generar una comunidad de aprendizaje entre profesores y especialistas en pedagogía universitaria a través de una metodología de aprendizaje entre iguales, con el fin de liderar un proyecto formativo; analizar las concepciones previas de los profesores sobre los procesos de enseñanza-aprendizaje para avanzar hacia un aprendizaje de calidad y establecer una vía de desarrollo profesional para el profesorado universitario acorde con el modelo de scholarship. La metodología propuesta se inscribe en el ámbito de las comunidades de aprendizaje, por lo que tanto en el diseño como en la puesta en práctica participan profesores de la propia universidad con bagaje en investigación educativa, asesores pedagógicos y expertos en distintos ámbitos temáticos relacionados con investigación en educación superior, así como los profesores participantes. Se han establecido requisitos de acceso al programa y unos compromisos por parte de los participantes. En esta primera edición, han sido seleccionados 25 profesores, atendiendo a criterios de experiencia docente, participación en proyectos de innovación educativa y formación pedagógica.

Abstract

In this paper, the launching program for INvestigation-Action EDucativa (INED), within the annual training call for university teachers organized by the Institute of Education Sciences (ICE) of the Universitat Politècnica de València (UPV) is presented. This program responds to the needs of teachers who initially started out with a professional background and therefore require training to advance in the process of professionalization of their teaching skills, aligned with the concept of scholarship and the movement generated around it. The proposed program is formulated as an action research to promote the improvement of teacher training approaches in higher education. The objectives are specified in provide Experiences in an innovative training proposal for university teachers in a scientific-technical educational context. Generate a learning community among professors and specialists in university pedagogy through a methodology of peer learning in order to lead a training project. Analyze the previous conceptions of the teachers about teaching-learning processes to move towards quality learning. And, establish a path of professional development for university teachers according to the model of scholarship. The proposed methodology falls within the scope of learning communities, so both the design and the implementation involve teachers from the university with a background in educational research, pedagogical advisors and experts in different thematic areas related to research in higher education, as well as the teachers participating in the training program. Requirements for access to the program and level of commitment on the part of the participants have been established. In this first edition, 25 teachers have been selected, based on criteria of teaching experience, participation in educational innovation projects and pedagogical training. This communication describes the modules, strategies and training sessions carried out in each of the phases of the program. Finally, some results on the development of the program are presented from different perspectives: the participants, the training team and the mentors.

1. Contexto

En este trabajo presentamos el programa de iniciación a la INvestigación-acción EDucativa (INED), dentro la convocatoria anual de acciones formativas para el profesorado universitario que organiza el Instituto de Ciencias de la Educación (ICE) de la Universitat Politècnica de València (UPV). INED responde a la necesidad del profesorado que parte con un bagaje profesional y requiere de formación para avanzar en el proceso de profesionalización de la docencia, alineado con el concepto de Scholarship of Teaching and Learning (SoTL). El programa que se formula como una investigación-acción para explorar nuevas propuestas de apoyo al desarrollo profesional docente, sigue una metodología que se inscribe en el ámbito de las comunidades de aprendizaje, por lo que tanto en el diseño como en la puesta en práctica participan: profesores con bagaje en investigación educativa (mentores de la UPV), asesores pedagógicos (ICE), expertos en temáticas relacionadas con investigación en educación superior y los profesores participantes. En este trabajo se describen los ejes clave sobre los que se hace la propuesta y se analiza el proceso de puesta en marcha, poniendo el foco en las percepciones de todos los que participan en su desarrollo.

2. Desarrollo profesional docente

El objetivo de INED es avanzar hacia una docencia profesional basada en la experimentación de la docencia y sus efectos en el aprendizaje del estudiante, que se apoya en evidencias y resultados contrastados y compartidos con los miembros de la comunidad académica. Partimos de dos ideas clave, la primera se refiere al concepto de profesionalidad académica (SoTL) y la segunda, conecta con el rol que desempeñan los modelos formativos basados en la investigación-acción y el aprendizaje entre iguales (peer review) para favorecer el desarrollo profesional docente.

2.1. Profesionalidad académica

El concepto de profesionalidad académica o SoTL explica qué se entiende por actuar como académicos en la práctica docente. Incluye la experimentación, reflexión crítica y comunicación de resultados de manera que sean conocidos y susceptibles de una revisión crítica por parte de otros miembros de la comunidad académica (Hutchings y Shulman, 1999). Este compartir los conocimientos adquiridos sobre enseñanza y aprendizaje es lo que puede diferenciar a un profesor excelente de un profesor que, además, puede considerarse un académico (scholar) (Kreber, 2002). Es investigar sobre el proceso de enseñanza-aprendizaje; utilizar la clase como un laboratorio para mejorar el aprendizaje; en definitiva, una finalidad de la Universidad (Ramsdem, 1992).

Un objetivo del SOLT es visibilizar lo que hacen los profesores para que el aprendizaje sea posible, pueda ser conocido y evaluado. Esta visibilidad conduce a la investigación y publicaciones (Kinchin, Lygo y Hay, 2008) que, consecuentemente, estimulan la innovación. Si investigas algo relacionado con el aprendizaje, hay que pensar antes qué puedo investigar, buscar ideas y modelos, etc. Para Cross y Steadman (1996) se trata del classroom research, definición operativa del scholarship of teaching, entendido en un sentido amplio, ya que esta visibilidad no se presenta en publicaciones formales, pero las publicaciones son sin duda la forma más obvia de manifestar esta experimentación y reflexión crítica (Henderson y Buchanan, 2007).

Kinchin, Lygo y Ha (2008) sobre el concepto de SolT encuentran que la práctica más común en el ámbito académico se entiende como la integración entre investigación y docencia con un énfasis puesto en la investigación sobre la docencia y el aprendizaje de la propia disciplina o, en un sentido más general. Así pues, un desafío es ayudar al profesorado a dar respuesta a sus preguntas sobre el aprendizaje de sus alumnos, Nicholls (2004) apunta que debemos integrar en nuestra cultura académica este significado de profesionalidad docente como un valor que debe ser reconocido y estimulado. En algunas universidades este tipo de investigaciones no cuentan porque versan sobre didáctica y aprendizaje y no sobre contenidos, pero esta situación está cambiando (Biggs, 1999, 2001). A muchos profesores la docencia es su identidad profesional y responde a su vocación personal. La integración docencia e investigación es un cauce viable para desarrollar más plenamente la vocación docente y otras legítimas aspiraciones profesionales.

2.2. La investigación-acción como vía de desarrollo profesional docente

La implicación del profesorado en proyectos de investigación-acción es una de las estrategias de desarrollo profesional que mejor encaja con el propósito de transformar las concepciones y creencias sobre la enseñanza y el aprendizaje y superar las barreras intrínsecas en los procesos de innovación. La indagación sistemática sobre la propia práctica permite fusionar formación, investigación y acción educativa. De este modo, la transformación de la práctica es el objeto mismo de un proceso investigador que se inicia y termina en esa misma práctica y da como resultado una transformación de la práctica y de las propias concepciones educativas del profesor implicado.

El rigor del método, con sus fases de planificación, acción, observación y reflexión, permite la construcción de un conocimiento práctico que constituye la esencia misma de la profesionalidad docente. El diagnóstico, la hipótesis-acción o la evaluación/reflexión final, momentos clave del método, exigen un diálogo intenso entre la teoría educativa y la situación específica. El resultado es la construcción de un conocimiento propio y situado que está ligado directamente a la práctica y a la transformación progresiva de esa práctica.

La mejora del impacto de su actividad radica en buscar soluciones a ese doble requerimiento de que el desarrollo profesional docente se construya desde la reflexión y la investigación sobre su práctica y contexto y de que ese esfuerzo se enmarque dentro de una estrategia institucional liderada desde los altos niveles de su dirección.

Estas investigaciones suponen un proceso sistemático para analizar la propia práctica y sus consecuencias en el aprendizaje. Comienzan con la identificación de un problema específico o dilema (¿hago esto o lo otro?), o con la propuesta de alguna innovación que se convierten en la pregunta que guiará la investigación. Se trata de cambiar el status del problema cualquiera que éste sea; de plantearlo como algo que hay que remediar, pasar a una investigación sobre la marcha para solucionarlo (Bass, 1999; Hutchings y Shulman, 1999).

Los alumnos son la muestra investigada en condiciones reales del aula. No hacen falta grandes muestras, aunque se pueden acumular datos, coordinarse con profesores, etc. Referente a la metodología, mayoritariamente son estudios cuantitativos, de carácter cuasi-experimental, verificando un cambio en los alumnos (antes y después), comparando resultados con un grupo control o examinando qué tiene que ver con qué (qué tipo de información se relaciona con un mejor rendimiento, etc.).

Kember (2003) afirma que para llegar a conclusiones convincentes es recomendable triangular la información. Es frecuente utilizar instrumentos para medir variables en las que

se espera algún cambio en función de alguna innovación y que no son directamente de rendimiento académico. También son frecuentes estudios cualitativos, grupos focus basados en entrevistas, estudio de casos, etc., o combinando diversas metodologías. En cualquier caso, estos estudios deben tener carácter académico con un objetivo claramente formulado y una planificación.

Se trata de investigar sobre variables que el profesor pueda modificar (enfoques, autoeficacia, motivación, autorregulación, etc.). El objetivo es dar respuesta a las preguntas que puede hacerse sobre cómo aprenden sus alumnos. Esta reflexión debe compartirse, hacerse pública y ser sometida a crítica o revisión para difundir qué innovaciones producen mejores resultados, etc. Esta difusión es necesaria para que esta profesionalidad se manifieste claramente y tenga un reconocimiento institucional. Hay que aportar una información comunicable y creíble (Henderson y Buchanan, 2007), y se suele dar mucha importancia a que estas revistas sean peer reviewed, sometidas a revisión y crítica de otros. Se otorgan premios y distinciones (awards) concedidos a profesores (común en otras culturas académicas). Es frecuente investigar en colaboración con otros profesores, el entrar por este tipo de investigación es una buena experiencia de aprendizaje para los mismos profesores que las llevan a cabo.

3. El Programa de iniciación a la investigación educativa (INED)

Una vez hemos abordado las líneas conceptuales en las que se enmarca el programa INED, presentamos a continuación los objetivos y descripción del equipo formativo.

3.1. Objetivos

Los objetivos de este programa se concretan en los siguientes:

- Experimentar una propuesta formativa innovadora para el profesorado universitario en nuestro contexto educativo.
- Generar una comunidad de aprendizaje con profesores y especialistas en pedagogía universitaria a través de una metodología de aprendizaje entre iguales que aprendan y lideren el proyecto formativo.
- Analizar las concepciones previas sobre los procesos de aprendizaje y enseñanza con el fin de avanzar hacia concepciones en las que el foco sea el aprendizaje de calidad.
- Establecer una vía de desarrollo profesional para el profesorado universitario acorde con el modelo de scholarship.

3.2. Equipo formativo y participantes

En gran medida la filosofía de programa ha dado un gran protagonismo a la red de tutores con dos perfiles: profesores de la UPV con experiencia en investigación educativa (6 mentores), desarrolladores educativos (3 asesores del ICE) y profesores expertos en diversas áreas de educación superior (6 expertos). Este equipo, acompaña a los participantes durante todo el proceso y participa de forma activa en las reuniones de coordinación y seguimiento, las sesiones formativas y las tutorías grupales (un mentor, un asesor pedagógico y cinco profesores participantes).

En esta primera edición del programa participan 25 profesores que han sido seleccionados a partir de criterios de experiencia docente, haber participado en proyectos de innovación educativa y tener formación pedagógica previa. Sus características nos han llevado a considerar unos requisitos de acceso y establecer unos compromisos de todos los participantes (mentores y profesores). Se buscaba un perfil de profesor con trayectoria docente y que formara parte de la masa crítica de profesores implicados con la docencia en nuestra universidad.

La acreditación se reconoce con 5 ECTS e implica haber seguido de manera regular todo el proceso formativo y elaborar el artículo de investigación con el nivel de calidad suficiente para ser publicado en revistas de alto impacto.

4. Fases de INED: Resultados de lo vivido hasta el momento

El programa se estructura en tres grandes fases. La primera corresponde a la iniciación al proceso de investigación. La segunda se centra en el diseño del proyecto de investigación. Y, la tercera, es el desarrollo y difusión de la investigación (prevista para el último trimestre de este año).

A continuación, abordamos el desarrollo de las dos primeras fases que son las que se han implementado hasta la fecha, indicando algunos resultados que consideramos de interés.

4.1. Fase Inicial: Iniciación al proceso de investigación

Todo comienza en una unidad de desarrollo educativo (ICE UPV) con una trayectoria extensa en el tiempo y en variedad de acciones en este ámbito, pero que es consciente de la necesidad de dar cambios cualitativos en las propuestas formativas a sus profesores para poder conectar con el concepto de SolT. En concreto, partíamos de una serie de interrogantes como "¿puede una acción formativa acompañar a profesores experimentados hacía un perfil de "profesor-investigador" sobre su propia docencia?; ¿Qué tipo de diseño sería el más apropiado?; etc.

Este impulso inicial es el que nos moviliza a contactar con profesores de nuestra universidad con cierta experiencia en investigación sobre docencia en sus respectivos campos de especialización y con una sensibilidad especial hacia la cuestión docente. Esta alianza es determinante para el éxito del programa, puesto que ha supuesto una verdadera construcción social del propio programa y de su desarrollo.

Fruto de esta construcción colaborativa es el planteamiento de la sesión inicial, una mesa redonda en la que los mentores narran su trayectoria en investigación educativa. Se planteó un ejercicio de proyección en relación al proceso y producto esperado en el programa "diseñar una investigación y elaborar un artículo científico que pudiera publicarse en revistas de calidad". Previamente a esta sesión, se les pasó un cuestionario a todos los participantes para conocer sus **expectativas** *"aprender a realizar una investigación rigurosa y sistemática, dando un salto cualitativo en la calidad de sus publicaciones para lograr, entre otras cosas, una mayor visibilidad de los resultados de sus trabajos"* y sus **focos de interés**, que van desde instrumentos de evaluación para aprender, a metodologías favorecedoras del aprendizaje activo; impacto de las tecnologías de información en el aprendizaje de competencias, calidad de entornos de aprendizaje participativos, interacción y cooperación entre iguales, etc.

La **segunda sesión** abordó los focos de investigación en educación superior. Su principal objetivo era generar un conflicto cognitivo entre sus ideas previas en relación con las pregun-

tas que se suelen hacer respecto a lo que funciona o no en la enseñanza. De ahí, reformularon sus preguntas iniciales de investigación, tarea que generó un trabajo profundo para situarlas en la perspectiva del aprendizaje y en su concreción.

A continuación, se desarrolló el módulo sobre el "diseño de proyectos de investigación educativa en el aula". En esta sesión se mostraron numerosos ejemplos de investigaciones educativas de estas características y se les facilitaron múltiples recursos para poder comenzar con el diseño de sus propias investigaciones, tales como instrumentos de medida o ejemplos de investigaciones publicadas. Con la finalización de estas sesiones comenzó el proceso de acompañamiento en el diseño de la investigación detallado en la siguiente fase.

4.2. Fase de diseño del Proyecto de investigación Educativa

En esta fase comenzamos con el desarrollo del protocolo de investigación y una guía de proceso. Se ha trabajado fundamentalmente a través del proceso de mentoría con los diferentes grupos tutoriales. Se podría decir que, poco a poco, se avanzaba en la clarificación de lo que querían investigar y cómo iban a hacerlo. En el proceso destacan algunos puntos críticos que provocaron la reflexión de todo el equipo de mentores. Estos puntos se concretan: en la pregunta de investigación, en la revisión de la literatura relacionada y en la comprensión del objeto de investigación al que nos enfrentamos cuando hablamos de educación. Presentamos algunos ejemplos de las preguntas de las investigaciones: "¿Cómo podemos evaluar la competencia trabajo en equipo a través de la realización de un Plan de dirección de proyecto?"; "¿La combinación de screencast y su evaluación es una metodología eficaz para entrenar la reflexión ética?"; "¿El uso de tecnologías puede facilitar la autorregulación de los alumnos para mejorar el grado de consecución de los objetivos de aprendizaje en Diseño de Sistemas Digitales?"; "¿En qué medida las actividades de aprendizaje hacen que los estudiantes opten por un aprendizaje profundo en la asignatura?"

Como resultado de más de dos meses de trabajo, en el mes de julio se llevó a cabo la *sesión conjunta* en la que cada uno de los participantes expuso su protocolo de investigación. El análisis de los protocolos nos permite extraer algunas conclusiones sobre cómo han ido evolucionando. Por ejemplo, en algunos casos, los marcos teóricos reflejan una buena conceptualización del problema que quieren estudiar encontrando respaldo en la literatura científica. Otros han sido capaces de presentar variados instrumentos validados que, redundarán en una mayor consistencia de su investigación. Referente a las propuestas metodológicas se observan problemas para aislar variables, desconocimiento de las técnicas más adecuadas para sus análisis y temor a incorporar una perspectiva más cualitativa en sus trabajos.

4.3. A partir de ahora

Llegados a este punto comienza el curso y con ello el momento de llevar a la práctica sus propuestas de intervención. Conscientes de lo delicado del momento, seguimos trabajando tanto en sesiones en grupos tutoriales como en grupos grandes. Fundamentalmente, el foco se pone en la obtención de los datos y en sus análisis. En el momento en el que escribimos este texto, los profesores están acabando su trabajo de campo para poder analizar lo ocurrido. El horizonte es que en el mes de julio se puedan tener resultados provisionales que se compartirán en una sesión conjunta. Sin embargo, el programa no finaliza aquí, sino cuando logremos que el mayor número posible de participantes hayan escrito su artículo y que este tenga un grado de calidad razonable para ser publicado.

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La Agenda 2030 desde las competencias transversales para estudiantes de nuevo ingreso en la Universitat Politècnica de València

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Resumen

En este estudio se presentan los resultados de los tres últimos cursos académicos para los estudiantes de nuevo ingreso de la Universitat Politècnica de València (UPV) en relación a la percepción y utilidad de las competencias transversales para su vida académico-personal y profesional. Además, se estudia la relación entre la percepción y utilidad de las competencias transversales y la Agenda 2030 a través de sus 17 Objetivos de desarrollo sostenible (ODS).

Desde la creación del EEES los títulos universitarios se construyen en base a competencias específicas, generales y transversales. La UPV ha sido pionera en incorporar 13 competencias transversales comunes a todas las titulaciones desde 2014 con la finalidad de que la formación de los estudiantes abarque no solo el aprendizaje de contenidos específicos de las materias impartidas, sino también la adquisición de destrezas, habilidades y valores transversales imprescindibles para su formación integral.

El actual Plan Estratégico UPV 2015-2020 establece 5 retos de los cuales el primero, cuarto y quinto constituyen un claro acercamiento hacia la formación de profesionales orientados al desarrollo sostenible.

Bajo este panorama se diseñó un cuestionario *ad hoc* con la finalidad de medir la percepción de los estudiantes de nuevo ingreso en relación a su dominio en las competencias transversales (adquirido previamente en su formación preuniversitaria) y su valoración respecto a la utilidad de estas competencias para su vida académico-personal y profesional. Adicionalmente se les plantea una pregunta abierta para que puedan indicar los motivos por los que estas competencias son o no importantes para su formación integral. A partir del análisis de esta pregunta abierta mediante la técnica estadística de minería de textos, se busca la relación con la Agenda 2030 y sus ODS. Indicar que en el último año se ha modificado la competencia Conocimiento de problemas contemporáneos incorporando los ODS a su definición.

En las Jornadas de Acogida se facilita a los alumnos el acceso al cuestionario desde el LMS de la UPV. La muestra con la que se realiza el estudio supone aproximadamente el 23% de los alumnos de nuevo ingreso el primer año, y 15% en los dos siguientes.

Abstract

This study presents the results of the last three academic years for new students of the Universitat Politècnica de València (UPV) in relation to the perception and usefulness of the transversal competences for their academic-personal and professional life. In addition, the relationship between the perception and usefulness of transversal competences and the 2030 Agenda is studied through its 17 Sustainable Development Goals (SDG).

Since the creation of the EHEA, university degrees have been built on the basis of specific, general and transversal competences. The UPV has been a pioneer in incorporating 13 transversal competences common to all the degrees since 2014 with the aim that the students' training covers not only the learning of specific contents of the subjects taught, but also the acquisition of skills, abilities and values essential for their integral formation.

The current UPV Strategic Plan 2015-2020 establishes five challenges, of which the first, fourth and fifth constitute a clear approach towards the training of professionals oriented to sustainable development.

Under this scenario, an ad hoc questionnaire was designed to measure the perception of new students in relation to their mastery of transversal competences (previously acquired in their pre-univer-

sity education) and their assessment of the usefulness of these competences for his academic-personal and professional life. Additionally, an open question is asked so that they can indicate the reasons why these competences are important or not for their integral formation. From the analysis of this open question through the statistical technique of text mining, the relationship with the 2030 Agenda and its SDG is sought. Indicate that in the last year the transversal competence of Knowledge of contemporary problems has been modified incorporating the SDOs to its definition.

In the Welcome Days students are given access to the questionnaire from the LMS of the UPV. The sample with which the study is conducted accounts for approximately 23% of new students in the first year, and 15% in the next two.

1. Las competencias transversales en la UPV/EHU

En el marco de las nuevas titulaciones y del cambio de modelo educativo inherente al proceso de Convergencia Europea, las competencias transversales, adquieren un protagonismo muy relevante. En este sentido, surge como una iniciativa del Vicerrectorado de Estudios, Calidad y Acreditación, el proyecto "Competencias Transversales (CT) de la Universitat Politècnica de València, respaldado por el plan estratégico UPV2020: "avanzar hacia modelos de formación que logren que sus estudiantes adquieran las competencias necesarias para poder tener una adecuada inserción laboral".

La finalidad del proyecto es proporcionar una formación integral y "competencial" a sus estudiantes, que puedan acreditar y, visibilizar los resultados adquiridos a la sociedad (empleadores, acreditaciones internacionales, etc), proporcionando a sus egresados la capacidad de adaptarse de forma rápida y eficaz a los cambios utilizando constantemente las competencias requeridas en su vida profesional y ciudadana, como miembros activos y reflexivos de la sociedad y de la naturaleza.

Son muchas las CT que se pueden trabajar en la Educación Superior y conviene agruparlas por tipologías. La agrupación de las Competencias Transversales UPV pretende sintetizar el perfil competencial que adquieren todo el alumnado y garantizar que se cubre el marco de referencia de algunas titulaciones con regulaciones o recomendaciones específicas, siendo un total de 13 competencias que se trabajan: *CT-1 Comprensión e integración; CT-2 Aplicación y pensamiento práctico; CT-3. Análisis y resolución de problemas.; CT-4 Innovación, creatividad y emprendimiento; CT-5 Diseño y proyecto; CT-6 Trabajo en equipo y liderazgo; CT-7 Responsabilidad ética, medioambiental y profesional; CT-8 Comunicación efectiva; CT-9 Pensamiento crítico; CT-10 Conocimiento de problemas contemporáneos; CT-11 Aprendizaje permanente; CT-12 Planificación y gestión del tiempo; CT-13 Instrumental específica.*

En el curso 2018-2019 se ha modificado el texto de la competencia CT-10 incluyendo de manera explícita los ODS. Implícitamente, desarrollar las CT con actividades auténticas es abordar los 17 ODS y contribuir en mayor o menor medida a las metas de la Agenda 2030 para cada uno de estos objetivos.

2. Estudio realizado

El estudio que presentamos responde a una línea de actuación del Proyecto institucional "Competencias transversales (CT)", de la Universitat Politècnica de València, cuyo objetivo es analizar la percepción y utilidad de las competencias transversales que tienen los y las estudiantes de nuevo ingreso sobre la formación de las CT en los distintos estudios de grado.

2.1. Metodología

Se ha diseñado un cuestionario ad hoc con la finalidad de medir en el alumnado de nuevo ingreso de la UPV la autopercepción de su nivel en cada una de las Competencias Transversales (adquirido previamente en su formación preuniversitaria) y, también el grado de importancia que tiene cada competencia para su desarrollo actual y futuro a nivel personal y académico. Ambas preguntas se han diseñado con una escala Likert con cinco alternativas para cada una de las competencias.

También, deben indicar las razones por las que consideran que la UPV debe o no formar a sus estudiantes en estas competencias. Se ha realizado el análisis mediante minería de textos.

El cuestionario está ubicado en la plataforma de la Universidad, es de fácil acceso y está abierto a lo largo del mes de septiembre. Se hace difusión en las Jornadas de Acogida y a lo largo del mes de septiembre se envían dos recordatorios para conseguir el máximo número de participantes.

Han participado 1010, 574 y 593 estudiantes respectivamente en los cursos 15-16, 16-17 y 17-18 que pertenecen a los distintos centros de la UPV. Representan el 23% del alumnado de nuevo ingreso en primer curso analizado y el 15% en el segundo y tercer cursos analizados.

2.2. Análisis y Resultados

En este apartado se presentan los resultados obtenidos del análisis del cuestionario. En la Tabla 1, se plasman las medias obtenidas en las dos cuestiones centrales abordadas: "Autopercepción del nivel del alumnado de nuevo ingreso en las distintas CT en el momento de entrada a la Universidad" (Nivel previo) y el"Grado de importancia: utilidad para su desarrollo actual y futuro (personal y académico)" (Utilidad). Podemos ver, que los resultados por años apenas varían en ambas cuestiones, así referente al nivel previo, la CT-7 es la que obtiene un mejor resultado (4,04) quizá por la extensa labor que están haciendo en etapas preuniversitarias de concienciación con acciones medioambientales, en valores y en responsabilidad ética. Por el contrario, es la planificación (CT-10) la competencia con menos preparación (3,56).

Si, nos centramos en utilidad asignada a las CT, es relevante que la CT-3, muy asociada a los estudios de ingeniería que se imparten en la UPV, presente valores elevados, también destacar las CT-4 y CT-6.

Para verificar si existen diferencias estadísticamente significativas entre las medias y medianas totales de las 13 CT tanto en el Nivel Previo (CT-P) como en la Utilidad (CT-U) se ha realizado el Análisis de la Varianza, la prueba de Kruskal-Walis y la prueba de la mediana de Mood. Con un p-valor de 0, en las tres pruebas, podemos concluir que existen diferencias estadísticamente significativas. En la Figura 1 puede verse como la CT-7-P (Nivel Previo) es la que mayor valor registra, seguida de la CT-6-P y CT-9-P. En cuanto a la utilidad, la CT-3-U es la más valorada, lo cual es comprensible en el entorno de las ingenierías, sin embargo, las CT-7-U y la CT-10-U que habitualmente suelen ligarse a la Agenda 2030 y a los ODS están en el conjunto de las menos útiles.

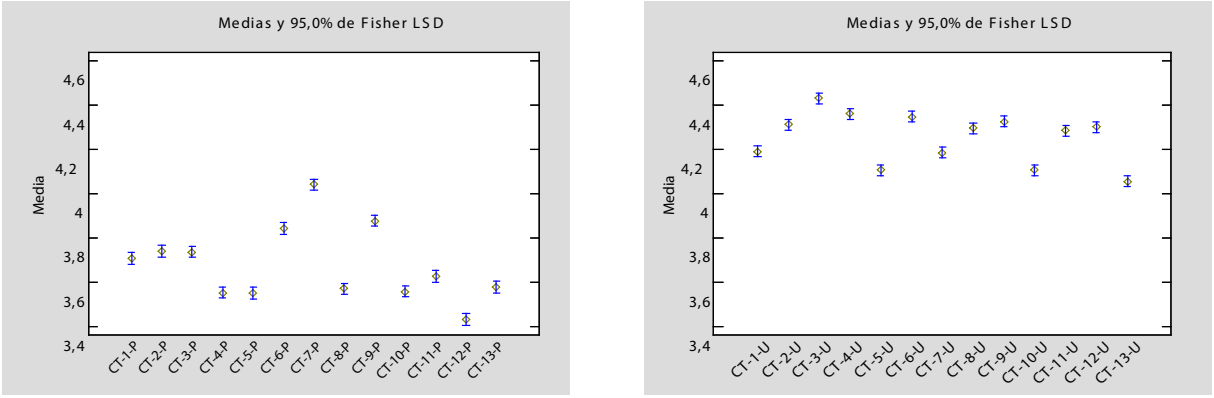
Tabla 1

Medias obtenidas en el Nivel Previo y el Grado de Utilidad en tres cursos académico y en el total

Competencias Transversales UPV		Nivel previo	Utilidad	Nivel previo	Utilidad	Nivel previo	Utilidad	Nivel previo	Utilidad
		2016		2017		2018		Total	
CT-1	Comprensión e integración	3,68	4,13	3,71	4,24	3,76	4,25	3,71	4,19
CT-2	Aplicación y pensamiento práctico	3,70	4,24	3,72	4,36	3,83	4,38	3,74	4,31
CT-3	Análisis y resolución de problemas	3,69	4,38	3,72	4,46	3,83	4,50	3,74	4,43
CT-4	Innovación, creatividad y emprendimiento	3,51	4,29	3,62	4,47	3,57	4,38	3,55	4,36
CT-5	Diseño y proyecto	3,53	4,05	3,58	4,21	3,56	4,11	3,55	4,11
CT-6	Trabajo en equipo y liderazgo	3,85	4,31	3,76	4,37	3,91	4,39	3,84	4,34
CT-7	Responsabilidad ética, medioambiental y profesional	4,02	4,17	4,06	4,21	4,06	4,20	4,04	4,19
CT-8	Comunicación efectiva	3,54	4,25	3,56	4,31	3,63	4,36	3,57	4,30
CT-9	Pensamiento crítico	3,85	4,26	3,84	4,37	3,95	4,39	3,87	4,33
CT-10	Conocimiento de problemas contemporáneos	3,56	4,09	3,50	4,10	3,61	4,14	3,56	4,11
CT-11	Aprendizaje permanente	3,59	4,26	3,64	4,32	3,68	4,28	3,63	4,29
CT-12	Planificación y gestión del tiempo	3,41	4,26	3,37	4,32	3,53	4,32	3,43	4,30
CT-13	Instrumental específica	3,55	4,05	3,60	4,08	3,62	4,04	3,58	4,06

Figura 1

Medias obtenidas en el Nivel Previo y el Grado de Utilidad para las 13 CT



Del total de alumnos que han participado, más del 92% han indicado que consideran importante que la Universidad forme en estas competencias para su desarrollo personal y profesional, como podemos ver en la Tabla 2.

Tabla 2

Frecuencias y porcentajes por año sobre la importancia de formar en CT la UPV

"Considero importante que la Universidad siga formándome en estas CT"	2016		2017		2018	
	f	%	f	%	f	%
SÍ	945	94%	544	95%	546	92%
NO	63	6%	30	5%	46	8%

El desarrollo de competencias transversales no es exclusivo de la educación formal de los estudiantes con actividades académicas. Existen otras vías de aprendizaje de las CT con actividades no académicas como actividades deportivas, estudios musicales, colaboración con asociaciones culturales u organizaciones solidarias entre otras. En la Tabla 3 se presentan la participación de los estudiantes en actividades no académicas.

Tabla 3

Frecuencias y porcentajes por año sobre el tipo de actividades no académicas

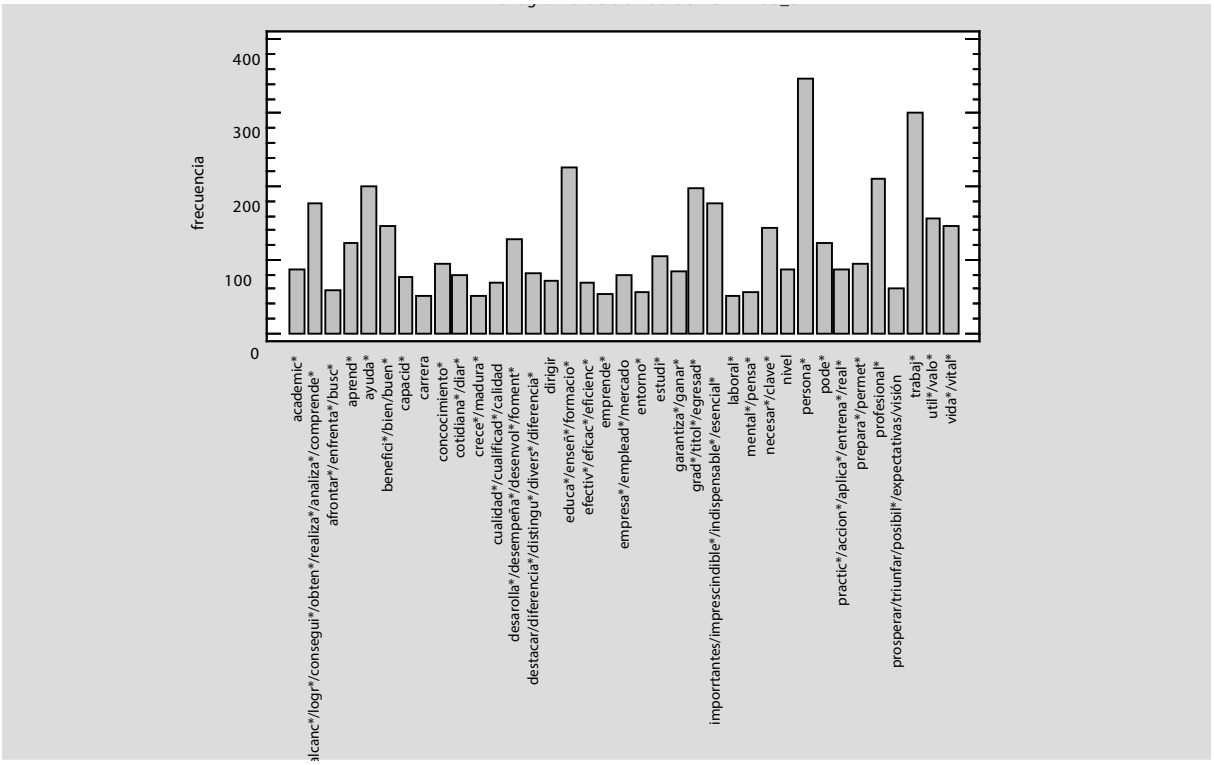
"¿Qué tipo de actividades NO ACADÉMICAS realizas que te ayuden a desarrollarlas?"	2016		2017		2018	
	f	%	f	%	f	%
Actividades deportivas	600	46	302	42	339	48
Estudios de música	153	12	92	13	70	10
Asociaciones culturales	127	10	71	10	49	7
Organizaciones solidarias	113	9	56	8	73	10
Otras	312	23	198	27	175	25

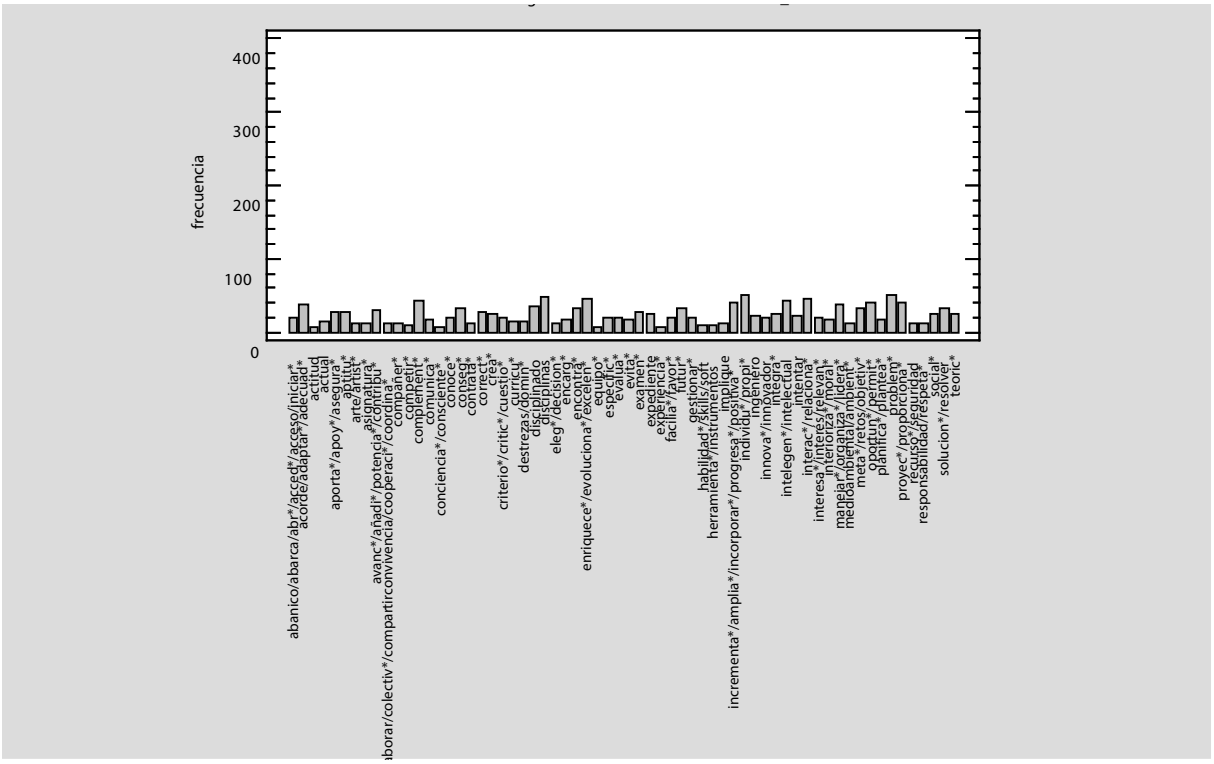
Por último, se pregunta al alumnado que explique porqué la universidad debe o no formar en CT. De las 1482 respuestas, solamente 42 corresponden a motivos por los que la universidad no debe formar en CT. Para evaluar si la respuesta del alumnado, está alineada con la Agenda 2030, se ha realizado un análisis de textos mediante minería de textos con las respuestas. En la figura 2 se observan aquellas palabras, agrupadas por similitud de significado, que tienen una frecuencia mayor a 50. De los términos con frecuencia mayor a 50, solamente los vinculados a educación, desarrollo, emprender y crecer están relacionados con la Agenda 2030.

De las palabras con frecuencia igual o inferior a 50, las vinculados a aptitud, crear, crítico, innovar, cooperación responsabilidad, medioambiental, actitud y conciencia están relacionados con la Agenda 2030, aunque con frecuencia relativa inferior a 3,5%.

Figura 2

Diagrama de barras de los términos con frecuencia mayor a 50 (parte superior). Diagrama de barras con una frecuencia inferior o igual a 50 (parte inferior)





3. Conclusiones

Incorporar la Agenda 2030 desde las CT es la nueva apuesta de la UPV que está asociada tanto al proyecto de CT como a su Plan Estratégico. Es necesario tener en cuenta los resultados obtenidos pues el alumnado no ve útiles las CT más ligadas a la Agenda 2030 y lo mismo se observa en las respuestas a la pregunta abierta.

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Ensure in-depth student learning practices by crossing perspectives between teachers and students

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Abstract

This communication is based on the work of a pedagogical team (two research engineers, a researcher, a pedagogical advisor and a teacher) conducting an action-research which aim at improving the teachers' pedagogical communication during lectures in order to improve and facilitate the student note-taking. This research measures and questions the teaching practices in a reflective way and contributes to improving the pedagogical training of teachers. Based on the research results, the critical reflection on the teaching practice and its evaluation, the purpose of the SoTL through action-research method is to contribute to the development of teachers' professional practices.

1. Note-Taking as a Key Academic Practice

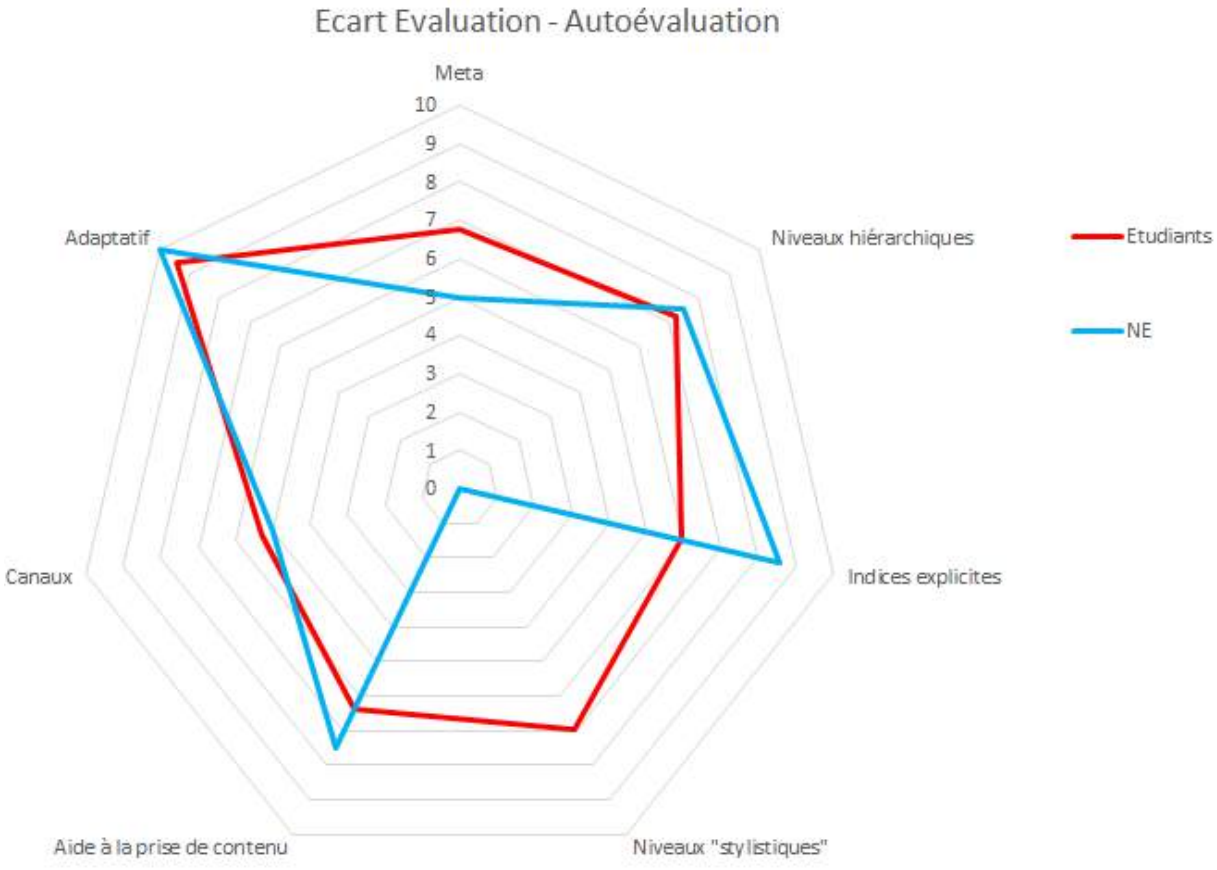
Note-taking remains an important academic practice with undeniable effects on academic success. This practice involves different conceptions among students: for some, it is simply a matter of recording information that will be the subject of consultation in a second step, while for others, it is a matter of synthesizing information. Whatever it may be, the complexity of note-taking practice remains unknown to students. Marked by the disciplinary knowledge (Delcambre and Lahanier-Reuter, 2012), students (especially undergraduate students) encounter difficulties that become all the more difficult to overcome because they depend on the teaching methods and materials used by teachers.

Being able to understand and follow the pedagogical instructions, rhythms and styles, which are part of the teaching process, require good organization and adaptations that can discourage some students. It then becomes essential to train and sensitize teachers on the impact of their pedagogical communication on the learning practices of their students.

Excerpts from the study "Improving pedagogical communication to support student note-taking:

Figure 1

Difference in perception of pedagogical communication between students (in red) and the teacher (in blue) on 7 factors
Reading key: The teacher does not realize his "way" of teaching. His style is implicit. On the other hand, it overvalues the clues it explicitly gives to take notes. Need to clarify the implicit ones



Following a three-phase experimental research protocol and with 3 independent groups of students (n = 77, n = 38, n = 30) and based on the complementarity of methods (questionnaire, self-questionnaire, semi-directive interviews, *in situ* observations), we measured 7 factors to improve pedagogical communication in order to improve student note-taking. Concerning the pedagogical communication of the teacher, the results collected made it possible to identify in the first instance gaps between the students' and the teacher's perceptions and then, subsequently, increase awareness on the part of the teacher of his or her own teaching practices. The tool made it possible to bring up points allowing the evolution of pedagogical practices for a better note-taking and thus the improvement of the teacher's pedagogical performance.

2. Our Approach: Working Together with the Teachers

After a preliminary interview to explain the approach with the teacher, first of all (Time 1), we submit an online questionnaire to the teacher and students during a first-class

session. The answers are collected and processed automatically by an automatic tool. They serve as a reference basis for comparison between the different measurement times. By comparing the responses collected from students with those of the teacher, the tool identifies gaps between the teacher's and students' perceptions of pedagogical practices. Depending on the results obtained, the teacher himself (or with the help of our pedagogical advisors) takes into consideration the suggestions for improvement proposed by the tool. To evaluate the implementation, in a second step (Time 2), we resubmit the questionnaire to the students in order to compare the results with those of the first course.

3. Results

We conducted tests to validate the automatic tool "Note-taking" and the psychometric results we have obtained demonstrate the usefulness of our action-research. The tool is very easy to use and offer relevant elements to the teachers to improve their pedagogical practices during class in order to foster the note-taking of their students. It should also be noted that the teachers themselves can use it in total autonomy or it can be used as a support tool by the pedagogical advisors.

This tool has a dual function: on the one hand, it helps to change teaching practices and, on the other hand, it helps to promote students' note-taking practices. This dual function makes it possible to identify that the main beneficiaries of this pedagogical tool are higher education teachers and their students. If the main objective of the project was to build an automated tool for (self-) evaluation of teaching practices that would encourage students to take notes, this project has made it possible to set up complementary actions that broaden the scope of beneficiaries. Our pedagogical centre in the University of Poitiers provide a "Note-taking" training for teachers and the administrative staff. In addition, we propose an online (self-) training modules to improve the methodological issues on note-taking (https://sites.google.com/espe-poitiers).

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Elaboration of an innovation project proposal for a real company based on its R&D&I strategies derived from its markets needs and its core competences

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Abstract

The importance of innovation in maintaining and improving business competitiveness is undeniable. Competitiveness and innovation are concepts that inevitably accompany and complement each other. The internalisation of both is considered a priority for a bachelor of Industrial Organization Engineering. A third year bachelor student already displays the personal and conceptual maturity that grants him a greater degree of responsibility and awareness of his reality to participate positively in the workplace. They must acquire and develop skills that allow them, in addition to internalising knowledge, to feed and generate their own knowledge to apply to the concrete reality of the company.

Based on this premise, and based on the foundations established in the European Higher Education Area (EHEA), work is being done to adapt the teaching-learning process to the needs of the current framework that the relationship between education and professional training seems to require. Hence, here emerges the interest in defining Bachelor Degrees that provide a more comprehensive meaning and content to the student, which is why it is important to strengthen the cohesion between subjects that make up the course.

In the University of the Basque Country (UPV/EHU), specifically in the Faculty of Engineering in Bilbao, and within the Bachelor of Industrial Organization Engineering, we have developed an Innovation Project that connects two complementary subjects: "Competitiveness and Business Innovation" and "Industrial and Technological Policy", in the third and fourth academic courses. A process is proposed that begins with the detection of company's R&D&I needs, and ends with the definition of a research project in response to these needs.

Each student, as part of a team, contributes to the development of the technological diagnosis of an SME (from Bizkaia) as the basis for defining an innovation project. This project must respond to the characteristics and needs of the company, as well as to the requirements of potential subsidies. The opinions expressed by the students who have participated in the experience have given positive evaluations, which encourage the design of this type of project.

1. Introduction

The management of innovation and competitiveness has been increasing its prominence in line with the boom in the effect of globalization. Recognition of the role of innovation in maintaining and improving business competitiveness is at the origin of this issue. It can not be ignored that the work of the student will be reflected shortly in the work of the worker, manager, collaborator outside the classroom, integrated into the reality of the day to day in the company.

Also, according to various studies, traditional teaching based on the master class and evaluation through a final exam has proved to be an inefficient tool in the learning process of students, in general, and of university students, in particular. At present, there are many

studies that show that active learning techniques improve the level of interest and learning of university students.

In this context, the implementation of the new Bachelor's degrees adapted to the European Higher Education Area entails a methodological change in which students, professors and administration and service personnel are participants and protagonists of the adaptation to this process of change [1].

Based on the above, the UPV/EHU has actively promoted the change of methodology in the delivery of its degrees through various "Teaching Development and Training" programs carried out by the Educational Advisory Service (SAE-HELAZ) [2]. Likewise, teacher initiatives aimed at educational innovation are supported within the dynamic and cooperative learning model, through the Educational Innovation Projects (PIE), framework under which this project has been developed.

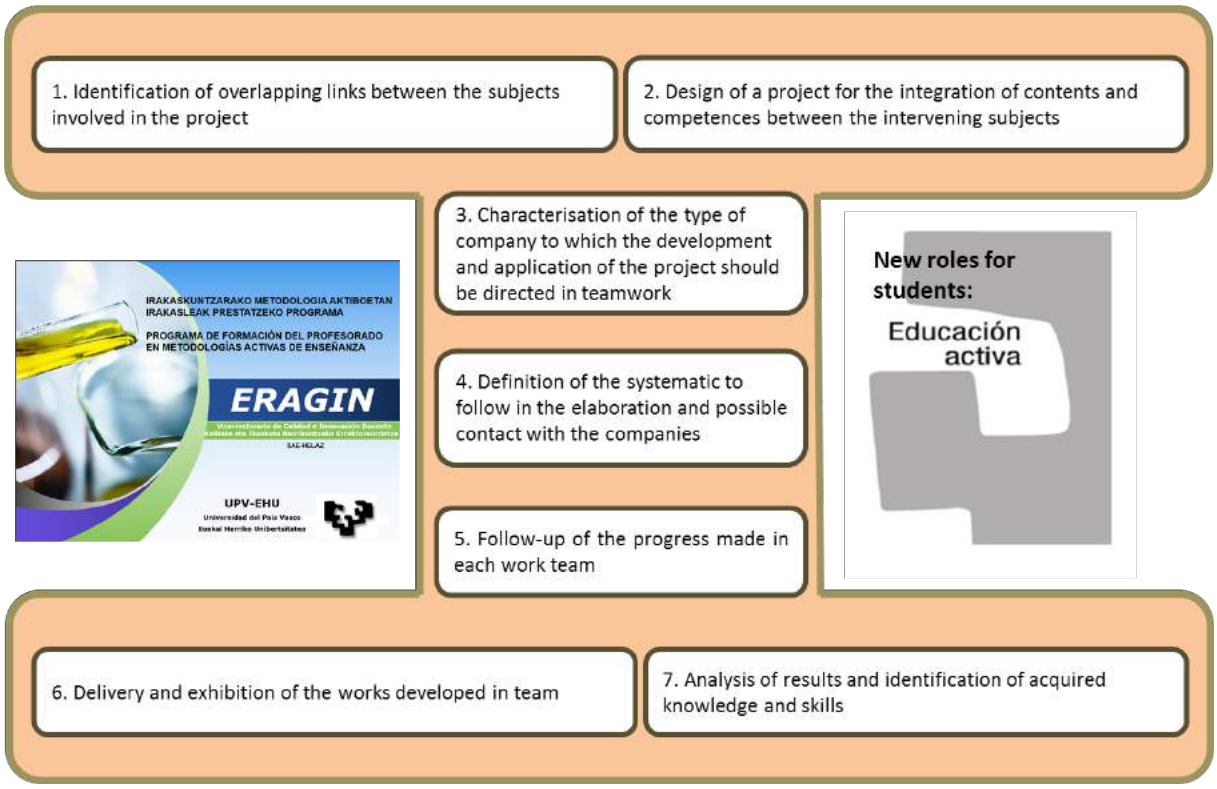
2. Objectives

To develop a practical learning experience based on active methodologies (according to the teacher training programme in active teaching methodologies ERAGIN for the acquisition of competences through a constructive process focusing the protagonism on the student. Each work team must prepare an innovation project proposal for a real company based on their R & D & I strategies, which derive from their market needs and their essential skills.

3. Methodology

The project to be developed begins with the analysis of the Teaching Guides of the intervening subjects to deepen the links between them. Then, the set of tasks to be developed is established in the context of each of the subjects attending to the period of delivery of the same, fixing the final deliverables that will be evaluated at the end of each subject. *Fig 1* shows the main phases that make up the methodology.

Figure 1
Methodology



Source: Own elaboration.

4. Results

Regarding the results, it is worth mentioning both qualitative and quantitative results, as expressed below:

4.1. Qualitative results

The application of active methodologies feeds the results obtained in the experience developed, so that:

- Students are responsible for their own learning, developing skills in the search, selection, analysis and evaluation of information.
- They participate in activities that allow them to exchange experiences and opinions with their peers and companies.
- They carry out reflection processes on what they do, how they do it and what results they achieve.
- They are aware of their environment, knowing the markets in which the companies are located and their characteristics.
- They develop aspects such as autonomy, critical thinking, collaborative attitudes, professional skills and self-evaluation capacity.

— They develop group conscience and individual and collective reflection of the business reality.

4.2. Quantitative results

The quantitative results data have been obtained from the design and application of a questionnaire from which the most relevant questions are set out below, *Table 1*:

Table 1
Extract from the questionnaire for the evaluation of the experience of the participating students

With respect to the experience of working with data from real companies, reflects the degree of satisfaction
93.3% of participating students rate the experience as **satisfactory and/or very satisfactory**
Regarding the development of personal skills, such as initiative, teamwork and communication, I think the experience has been:
93.3% of participating students rate the experience as **interesting and/or very interesting**
Regarding the approach of linking two subjects of consecutive courses through the content of the seminars
73.3% of participating students rate the experience as **very interesting**
As for the possible improvements to incorporate in this modality of seminars (linking different subjects and with ample margin of development and decision based on information offered by real companies). You can mark the number of answers you consider
100.0% of the participating students agreed that **obtaining information directly from the company** entails a **high** degree of **difficulty**.
With regard to the effort I have made to make the dynamics of the seminars more appropriate, I believe that:
53.3% of the participating students indicated that they had participated with a **high** degree of **effort**, and **46.6%** indicated that they had made a **fair effort** to comply with the requirements.
As a novel experience, and taking into account the difficulties presented, I consider that my degree of general satisfaction is
86.6% of participating students expressed a **high** degree of **satisfaction**

As a global result of the experience, it is worth noting that 86.6% of the students participating in the experience expressed a HIGH degree of general satisfaction.

5. Conclusions and Future Lines of Research

At present, in the process of university teaching-learning, the acquisition of knowledge is a necessary but not sufficient condition, since it also requires the development and acquisition of skills that enable students in skills necessary to respond to business needs. The effective acquisition of competencies requires the implementation and application of different

work dynamics in which students, through the performance of activities predesigned by the teacher, become the main actors of their own learning. The project has experimented with active methodologies to link the competences of two subjects of consecutive courses and get students to internalize them. The results obtained are satisfactory both qualitatively and quantitatively.

With a view to the near future, the proposal is considered to extend these practices to the greatest possible number of subjects of the Bachelor of Industrial Organization Engineering, within which the experience carried out in this project is situated. The experience gained is presented as the starting point of a network of relationships and synergies between the competences of the set of subjects that make up the Bachelor Degree, in such a way that the student can play a leading role in their internalisation in a coordinated way, understanding that this is an integrated process in which the assimilation of competences is achieved in a natural and coherent way.

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Aspectos neuropsicológicos como base facilitadora para un aprendizaje musical significativo

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Resumen

La presente investigación ha tenido como objetivo analizar desde el ámbito de la neurociencia aspectos que resultan de gran relevancia para lograr un aprendizaje exhaustivo y significativo en la enseñanza musical.

Para ello, se han seleccionado alumnos universitarios del grado de música, preuniversitarios y músicos posgraduados y universitarios no-músicos con el fin de evaluar la creatividad, la atención, el rendimiento académico y la percepción del timbre dentro del campo de la audición. Se utilizaron como instrumentos de medida el Test de Inteligencia Creativa, el Test de Atención D2 y la prueba experimental Ikarak que consiste en la ejecución de distintos sonidos y su reconocimiento auditivo.

Tal y como indican las bases neuropsicológicas de la creatividad y del timbre, el procesamiento auditivo viene de la mano del área subcortical, con la codificación neural del tono, el timbre y el ritmo. Además, las áreas implicadas en la creatividad también requieren de múltiples conexiones córtico-corticales y córtico-subcorticales.

Los resultados muestran correlaciones positivas y estadísticamente significativas entre atención y creatividad por un lado, y entre atención y rendimiento académico por otro.

Asimismo, a pesar de que los cerebros de los músicos expertos responden de manera diferente a los estímulos musicales que el cerebro de los no-músicos, los análisis de la prueba Ikarak aportan puntuaciones altas en el reconocimiento auditivo de los distintos sonidos que ofrecen diversos timbres tanto por músicos posgraduados como por la muestra de universitarios no-músicos.

Como conclusión, cabe destacar la importancia que tiene atender a las bases neuropsicológicas de los distintos aspectos analizados, ya que el conocimiento de las funciones cerebrales así como las bases de la psicología cognitiva, son los pilares en los que se apoya todo proceso de aprendizaje de calidad y vanguardista. Teniendo en cuenta los resultados obtenidos se pueden establecer programas potenciadores de la creatividad, la atención y la sensibilidad tímbrica con el fin de fomentar que la totalidad del alumnado alcance su máximo rendimiento académico, reflejo de un aprendizaje significativo.

Abstract

The aim of the current project was to analyze from the point of view of the neuroscience some relevant aspects which allow to achieve an exhaustive and significant learning in music education.

For this purpose, university students of the music degree, pre-university and post-graduate musicians and non-musicians university students have been selected in order to evaluate creativity, attention, academic achievement and perception of the timbre related to the area of auditory education. The Creative Intelligence Test, the D2 Attention Test and the Ikarak experimental test consisting of the execution of different sounds and their auditory recognition were used as measuring instruments.

Neuropsychological bases of creativity and timbre, assert that auditory processing comes from subcortical area, with the neural coding of tone, timbre and rhythm. In addition, the areas involved in creativity also require multiple cortico-cortical and cortico-subcortical connections.

On the one hand, the results show positive and statistically significant correlations between attention and creativity, and on the other hand, between attention and academic performance. Likewise, although the brains of expert musicians respond differently to musical stimuli than the brain of non-musicians, the analysis of the Ikarak test provides high scores in auditory recognition of the different sounds offered by different timbres, obtained by postgraduate musicians and by the sample of non-musicians.

In conclusion, it is worth noting the importance of paying attention to development of neuropsychological learning of the different aspects analyzed, since the knowledge of brain functions as well as

the basis of cognitive psychology are the pillars on which all quality and avant-garde learning processes are based on. Taking into account the results obtained, programs to boost creativity, attention and timbral sensitivity can be established in order to encourage all students to accomplish their full potential and high academic achievement, as they are a reflection of an effective and significant learning.

1. Antecedentes

Actualmente las enseñanzas musicales, junto con otras disciplinas como la danza o la pintura, se presentan dentro del área de las enseñanzas artísticas. En éstas, una de las principales competencias que debe desarrollar el alumnado es la creatividad, entendida como la capacidad de las personas para producir composiciones, productos o ideas de cualquier clase, esencialmente nuevas y previamente desconocidas para quien las produce (Villamizar, 2012).

Por otro lado, un aspecto de gran relevancia para el aprendizaje general y en particular para el de las enseñanzas musicales es la atención, definida como el mecanismo cognitivo mediante el que se ejerce el control voluntario sobre la actividad perceptiva, cognitiva y conductual (Sánchez-Cabaco, 2004).

Así mismo, diversas investigaciones relacionan la influencia positiva de la creatividad en el proceso de enseñanza-aprendizaje, ya que suele facilitar un mejor rendimiento académico de los alumnos (Campos y González, 1993; Garaigordobil y Torres, 1996; López-Calichs, 2006; Reid y Petocz, 2004). No obstante, la mayor parte de la literatura científica está centrada en el rendimiento escolar y son escasas las investigaciones centradas en el ámbito musical. En España, Martín, León y Vicente (2005) comprobaron la relación entre creatividad, atención y aptitudes musicales en niños de entre 10 y 12 años que no recibían educación musical reglada. Tras el estudio se observó que tanto la atención como la creatividad influían de manera significativa en las aptitudes musicales, encontrándose correlaciones positivas y estadísticamente significativas entre atención y aptitudes musicales, y entre creatividad y aptitudes musicales.

Además, diferentes estudios han mostrado una relación entre la capacidad de atención y el rendimiento académico (Barry, Lyman y Klinger, 2002; Biederman *et al*., 2004; Tejedor, González-Gonzales y García-Senoran, 2008; Castillo, Gómez-Pérez y Ostrosky, 2009; Fernández-Castillo y Gutiérrez-Rojas, 2009). Castillo y Gutiérrez-Rojas (2009) examinaron la relación entre la capacidad de atención, funciones ejecutivas, memoria y rendimiento académico en niños de Educación Primaria. Los resultados mostraron que cuanto mayor es la capacidad de atención, funciones ejecutivas y memoria, el nivel de rendimiento académico resulta más elevado.

Por otro lado, diversos trabajos han analizado la percepción del timbre en músicos y no-músicos. Por ejemplo, Chartrand y Belin (2006) analizaron las características del procesamiento auditivo para la afinación y el timbre. Así, compararon el desempeño de músicos y no-músicos en dos tareas de discriminación de timbre tanto instrumental como vocal. Los resultados obtenidos señalaron que los músicos tuvieron un mejor desempeño en ambas pruebas respecto a los no-músicos. Otro estudio que cabe resaltar es el de Pantev, Roberts, Schulz, Engelien y Ross (2001). En él, se afirmaba que los cerebros de los músicos expertos responden de distinta manera a los estímulos musicales que el cerebro de los no-músicos. Además, se mostraba que gracias a medidas con neuromagnetismo, las representaciones corticales auditivas para los tonos de diferente timbre como violín y trompeta se mejoran en comparación con los tonos sinusoidales y por ello se citaba la importancia de la plasticidad del cerebro para un reconocimiento tímbrico. Shahin, Roberts, Chau, Trainor y Miller (2008) corroboraron las investigaciones anteriores ya que en su estudio los músicos profesionales mues-

tran una mayor agudeza en la percepción del timbre. Por último, el estudio de Kraus, Skoe, Parbery-Clark y Ashley (2009) señalaban que el habla y la música son señales muy complejas que tienen muchas características acústicas compartidas. Además, defendían que el tono, timbre y ritmo se consideran como las categorías perceptivas generales, encontrando resultados que indicaron que los sujetos entrenados musicalmente mejoran en representaciones subcorticales de los tres aspectos (tono, timbre y ritmo). Asimismo, mostraron que los efectos de la experiencia musical en el procesamiento auditivo subcortical son profundos y se extienden más allá de la música a las áreas del lenguaje y de la emoción. La maleabilidad sensorial de la codificación neural del tono, el timbre y el ritmo está por tanto afectada por la experiencia.

Por último, cabe señalar que tal y como indican las bases neuropsicológicas de la creatividad y del timbre, el procesamiento auditivo viene de la mano del área subcortical, con la codificación neural del tono, el timbre y el ritmo. Además, las áreas implicadas en la creatividad también requieren de múltiples conexiones córtico-corticales y córtico-subcorticales. Por tanto, podemos afirmar que las variables que trata nuestro estudio están muy ligadas ya desde un primer instante desde un punto de vista cerebral.

2. Objetivo

La presente investigación ha tenido como objetivo analizar desde el ámbito de la neurociencia aspectos que resultan de gran relevancia para lograr un aprendizaje exhaustivo y significativo en la enseñanza musical. En concreto, nos hemos centrado en evaluar la creatividad, la atención y su repercusión en el rendimiento académico y la percepción del timbre dentro del campo de la audición, en una muestra de alumnos universitarios del grado de música, preuniversitarios y músicos posgraduados y universitarios no-músicos.

3. Método

Se han seleccionado por un lado 84 alumnos preuniversitarios con el fin de evaluar la creatividad, la atención y su repercusión en el rendimiento académico y, por otro lado, 60 músicos posgraduados y universitarios no-músicos para la evaluación de la percepción del timbre dentro del campo de la audición.

Para la medición de la creatividad se ha utilizado el Test de Inteligencia Creativa (CREA; Corbalán *et al.,* 2003). Esta prueba evalúa la inteligencia creativa a través de una evaluación cognitiva de la creatividad individual, con el objetivo de conocer el grado en el que el sujeto es capaz de generar cuestiones en el contexto teórico de búsqueda y solución de problemas.

Se ha utilizado también el *Test de Atención d2* (Brickenkamp, 2004; adaptación de Seisdedos, 2004) que evalúa el grado de atención selectiva y concentración mediante la evaluación de distintos aspectos, que se reflejan en tres componentes de la conducta atencional: la velocidad, la precisión, la estabilidad o el control emocional. La velocidad hace referencia al número de estímulos que se han procesado en un determinado tiempo; la precisión se refiere a la calidad del trabajo, y está inversamente relacionado con la tasa de errores cometidos; y la estabilidad o el control emocional están reflejados mediante la relación entre la velocidad y la precisión de actuación.

Para la medición del reconocimiento tímbrico, se ha empleado la *Prueba experimental Ikarak*. Para la obtención de esta prueba, en primer lugar, dos violinistas grabaron cuatro sonidos distintos por cada cuerda al aire del violín, manteniendo constantes la intensidad, altura

y duración. La prueba consiste en rellenar unas casillas, en las que cada sonido tiene cuatro posibles adjetivos con los que calificarlo (redondo, apagado, brillante y ácido), y están ordenados en función de la cuerda del violín. Es decir, los primeros cuatro sonidos son todos en la cuerda "sol", los siguientes cuatro en la cuerda "re", los siguientes en la cuerda "la" y, por último, en la cuera "mi". Toda esta serie se repite dos veces, ya que los dos violinistas han grabado la serie completa. El orden de los adjetivos es aleatorio, pero para todos los participantes se respeta el mismo orden, para que estén en igualdad de condiciones. La puntuación máxima por tanto es de 32 sonidos.

Para la medición del rendimiento académico, los resultados académicos en música se recogieron del expediente académico de junio de cada alumno.

El análisis de correlaciones fue realizado mediante el coeficiente de correlación producto-momento de Pearson. Asimismo, los análisis de datos fueron realizados mediante el programa estadístico SPSS. En el análisis de las correlaciones se tuvo en cuenta el valor *p*, con el fin de conocer si los resultados eran estadísticamente significativos, para descartar que fueran fruto del azar.

4. Resultados

Los resultados muestran correlaciones positivas y estadísticamente significativas entre atención y creatividad y, también, entre atención y rendimiento académico.

Asimismo, a pesar de que los cerebros de los músicos expertos responden de manera diferente a los estímulos musicales que el cerebro de los no-músicos, los análisis de la prueba Ikarak aportan puntuaciones altas en el reconocimiento auditivo de los distintos sonidos que ofrecen diversos timbres, tanto por músicos posgraduados como por la muestra de universitarios no-músicos.

5. Conclusiones

Como conclusión, cabe destacar la importancia que tiene atender a las bases neuropsicológicas de los distintos aspectos analizados, ya que el conocimiento de las funciones cerebrales así como las bases de la psicología cognitiva, son los pilares en los que se apoya todo proceso de aprendizaje de calidad y vanguardista. Teniendo en cuenta los resultados obtenidos se pueden establecer programas potenciadores de la creatividad, la atención y la sensibilidad tímbrica con el fin de fomentar que la totalidad del alumnado alcance su máximo rendimiento académico, reflejo de un aprendizaje significativo.

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Primeros resultados de la aplicación de clase inversa en la asignatura de expresión gráfica de primer curso de Ingeniería Industrial de la UPV/EHU

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Resumen

Durante el curso 2018-19, se aplica por primera vez la metodología de Clase Inversa en dos grupos de primero de la asignatura de Expresión Gráfica en la Escuela de Ingeniería de Bilbao de la Universidad del País Vasco (UPV/EHU).

Primero, se ha comparado el resultado del examen parcial del primer cuatrimestre con el resultado de un test realizado en clase. Los datos muestran una tendencia a mejorar la nota en el examen cuando mejoran los resultados en el test en alumnado que asiste a clase y que no basa su estudio en academias (r2 = 0,48), que nosotros denominamos estudiantes *flip activos*.

Segundo, se han comparado las notas del examen parcial con las obtenidas el curso anterior, obteniendo mejores resultados, especialmente en el porcentaje de aprobados y de notas > = 6, en el segundo año académico, cuando se aplica Clase Inversa. Esto no ocurre en otro grupo de comparación, que mantiene la misma metodología tradicional. Cambios en el proceso de matriculación y de adscripción de los profesores a los grupos han impedido obtener más grupos de comparativa.

Esta primera experiencia ha servido para conocer las dificultades de abordar la evaluación cuantitativa de la aplicación de la metodología Flip.

Abstract

For the first time, Clase Inversa was applied in the academic year 2018-19 in two groups of studentes of 1st year of Graphical Expression subject in the Industrial Engineering School of Bilbao (University of the Basque Country UPV/EHU).

First, we compared the exam scores of the partial exam of the first term with the marks achieved in a test passed during class hours. Data show a trend to improve exam results when the test marks are higher in students who assist class and do not base their work in private academies (r2 = 0,48), that we call *active flip* students.

Second, we compared compared the scores of the same exam with those obtained in the previous academic year, observing an improvement, especially in the percentage of passing students and of scores > = 6 in the second academic year when Flipped Classroom is applied. This is not the case in other group of comparation, that mantains the traditional methodology. Changes in students registration process and professors adscription to groups avoid the possibility further groups of comparation.

This first experience permits to face the difficulties of evaluating quantitatively the application of Flip methodology.

1. Introducción

Existen múltiples experiencias documentadas en las que la aplicación de la clase inversa o *Flipped Classroom* se percibe positivamente tanto por parte de los docentes como por parte del alumnado, en cuanto a la relación que se establece entre ambos, la dinámica de clase y la incentivación del estudio progresivo que hace que el alumnado se sienta mejor preparado a la hora de afrontar las pruebas de evaluación.

Sin embargo, estas apreciaciones no siempre van unidas a medidas cuantitativas de esa mejora. La metodología y el contexto son determinantes en esos resultados, no siendo lo mismo que se trate de una asignatura aislada [3] o, por el contrario, es una apuesta del Centro o de la Universidad [6]).

El departamento de Expresión Gráfica y Proyectos de Ingeniería de la Escuela de Ingeniería de Bilbao de la UPV/EHU se enfrenta a problemas típicos en la enseñanza de la asignatura de Expresión Gráfica de primer curso, como son la falta de metodología y la falta de motivación de el alumnado[5]. Un Proyecto de Innovación Educativa realizado por el equipo docente en 2015 [2], permite elegir la metodología de Clase Inversa como la más adecuada para realizar una renovación de la asignatura [4], y revela la necesidad de mejoras en la documentación puesta a disposición para el alumnado, este último punto reforzado por la opinión del alumnado recabada mediante encuesta. En respuesta a esta demanda, se publica el Open Course Ware (OCW): Superficies básicas para Ingeniería (2018).

En el presente curso académico 2018-19, se ha realizado la primera experiencia de aplicación de la clase inversa. La aplicación de la metodología *Flip* se ha basado en la puesta a disposición de la información necesaria de seguimiento de la asignatura (planificación, presentaciones previas a la clase, información complementaria, test de autoevaluación, etc.) en la plataforma virtual de apoyo a la docencia de la UPV/EHU, en el desarrollo de clases muy activas con actividades que desarrollaban distintos procesos cognitivos [1].

2. Objetivos

El objetivo de este trabajo es realizar las primeras medidas cuantitativas de la posible influencia de la aplicación de la metodología de clase inversa en la asignatura de Expresión Gráfica en el primer curso de Ingeniería Industrial de Bilbao.

3. Metodología

Los resultados de la aplicación de la metodología Flip durante el primer cuatrimestre se evalúan de la siguiente manera:

1. Comparativa de los resultados de un test de evaluación realizado en clase con el alumnado *Flip* sobre el tema de las Superficies Básicas para la Ingeniería (trabajado mediante el OCW), con los resultados del ejercicio de diédrico del examen del primer cuatrimestre, común a todos los grupos y de corrección colegiada.
2. Comparativa de la nota del examen de diédrico del primer cuatrimestre en dos cursos académicos sucesivos, sin (2017-18) y con (2018-19) *Flip*.
3. La misma comparativa que el punto anterior con un grupo que mantiene la metodología tradicional.

En el Test se incluye una encuesta sobre metodologías de estudio: deben valorar de 1 a 5 la utilidad del OCW, las clases, las láminas o la ayuda externa (academia) para preparar el Test.

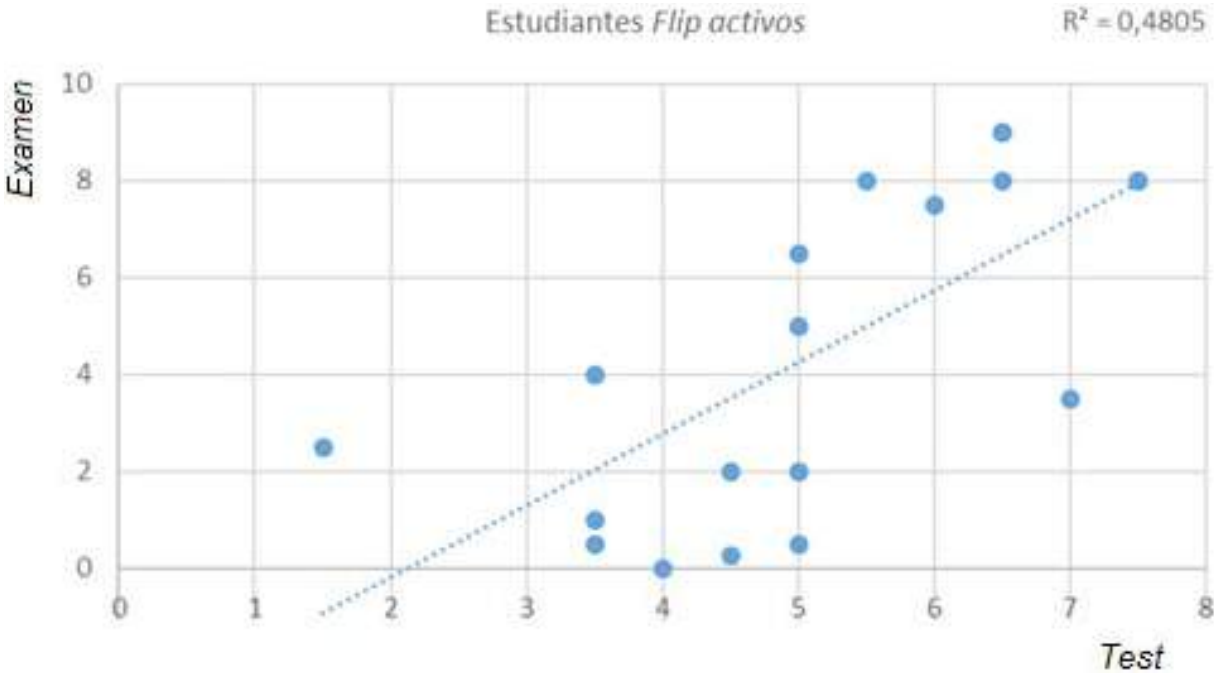
4. Resultados

4.1. Influencia del trabajo en clase sobre la nota del examen parcial

Al comparar los resultados obtenidos por el Test sobre superficies de clase, con el resultado del ejercicio sobre diédrico en el examen del primer cuatrimestre (ver *Fig. 1.)*, se observa una gran dispersión. Hay que considerar que la prueba es de libre asistencia y no tiene repercusión en la evaluación final, de modo que la tasa de presentados es elevada (91% de matriculados), comparado la asistencia habitual a las clases (28% de matriculados, 50 estudiantes).

Con los datos de la encuesta se añaden sucesivamente una serie de filtros para seleccionar el alumnado. El primer filtro, la valoración positiva del OCW Superficies básicas para Ingeniería, no mejora el resultado. Sin embargo, la aplicación de un filtro de asistencia a clase durante las semanas en que se trata el tema, junto con otro filtro adicional en que se eliminan los estudiantes que valoran de forma positiva la ayuda de una academia para enfrentarse al Test (lo que se entiende como una pérdida de referencia de la información recibida en clase), muestra una ligera tendencia lineal ($R^2 = 0,48$, N = 19). Estos son los que nosotros denominamos estudiantes *Flip activos*.

Figura 1
Comparativa entre la nota del Test y del Examen del primer cuatrimestre del alumnado flip activo



4.2. Comparativa entre grupos con distinta metodología de aprendizaje-enseñanza

La comparativa de los resultados entre examen del primer cuatrimestre en dos cursos sucesivos, sin y con *Flip* (Grupo A de la *Tabla 1*), muestra mejoras en el segundo curso (notas medias, medianas, número de aprobados sobre presentados y número de exámenes con

nota ≥6). Cuando se aplica *Flip*, el porcentaje de presentados sobre el total aumenta en un 7% y el de aprobados sobre el de presentados en un 12%.

La tendencia positiva en el segundo año académico no aparece en el grupo de comparación de metodología tradicional (grupo B de la *Tabla 1*), en el que únicamente se observa una mejora en el número de alumnos presentados y aprobados, algo que es parejo al incremento en la matrícula, pero el porcentaje sobre presentados disminuye un 11%. La comparativa entre cursos se ha realizado entre grupos de matriculación iguales (lo que parece influir en el nivel de conocimiento inicial) y con el mismo profesor en ambos cursos.

Tabla 1

Comparativa entre dos años académicos. Grupo B de metodología tradicional, y grupo A con metodología Flip el segundo curso. Los incremento se señalan con asterisco.

	Grupo A		Grupo B	
	2017-18	**2018-19***(Flip)*	**2017-18**	**2018-19**
Media	3,42	4,13*	5,84	5,02
Mediana	3	4,50*	6,25	5,25
Máxima	9	9	10	10
Presentados	53	50	37	61*
Aprobados	16	23*	26	36*
Nota > = 6	10	16*	23	23
Total alumnos	98	82	46	68

5. Discusión

Los resultados más relevantes que parecen indicar una influencia positiva de la metodología son:

— La comparativa entre el trabajo realizado en clase y los resultados del ejercicio de diédrico del examen primer cuatrimestre parece mostrar una tendencia cuando se realiza una selección de alumnos *Flip activos*, que asisten a clases y tienen ese trabajo como referente.
— Al comparar los resultados del examen con los del curso académico previo, se observa una mejora en los resultados en el curso de aplicación de *Flip*, principalmente en el porcentaje de los presentados y en la nota media obtenida. Este hecho no se observa en otro grupo de metodología tradicional.

Además, este estudio ha puesto en evidencia las dificultades a la hora de evaluar cuantitativamente la influencia de cualquier metodología en los resultados académicos, debido a varios factores:

— Elevado absentismo (>70%) en el grupo de medida, desde las primeras semanas de clase.
— Adopción de fuentes externas (academia) como referencia para la información de estudio, de modo que no se hace el trabajo de clase, o pasa a un segundo plano.

— Evaluar sobre los exámenes, a los que sí asisten los alumnos aunque no vayan a clase, mezcla alumnos *Flip* y no *Flip*.
— Cambios en el profesorado y en la matriculación, que aportan otro factor más a la heteogeneidad de la muestra que se está analizando.

6. Conclusiones

Las ventajas de la aplicación de la metodología Clase Inversa no son fácilmente evaluables, especialmente en entornos universitarios, con masificación de alumnos y cambios constantes de profesorado. No obstante, la evaluación puede abarcarse de manera parcial dentro de la clase, en donde se puede delimitar una muestra de estudiantes *Flip activos*.

Nuestros resultados reflejan una experiencia pionera de la aplicación de la metodología de la clase inversas en la Escuela de Ingeniería de Bilbao, y se deben interpretar desde la perspectiva de su corto recorrido.

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The role of the teaching-learning process and assessment methodology of the Final Degree Project as a way of completing education in Chemistry

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Abstract

The Final Degree Project represents an excellent opportunity for applying and testing inquiry/research based learning/teaching methodologies. Last year undergraduate students face, under a close supervision, applied cases that allow them to reinforce learned concepts and skills, and acquiring new ones regarding processing information. Supervisors play a key role in the teaching/learning processes during this period. Their continuous assessment strengthens the capacities of inquiry, problem resolution and innovation, leading to a substantial improvement of the students' abilities.

In the last 5 years, more than 300 Final Degree Projects in Chemistry have been successfully carried out and defended in the Faculty of Science and Technology (ZTF/FCT) of the UPV/EHU. The evaluation process, based on the submission of a final report, and a dissertation defense, is conducted by a panel of lecturers, and does not include any of the supervisors. Up to now, aiming to evaluate all the students in an unbiased way, the projects have been evaluated following a common criteria adopted by the Faculty for all the grades. Since this procedure lacks a proper feedback from the supervisors, cannot efficiently evaluate the knowledge gained by the students, and probably, fails to provide a global view of the teaching/learning process.

Aiming to achieve a more accurate assessment of the knowledge gained by the students, we have used the experience gathered until now to investigate the validity of the methodology employed in the evaluation of the Final Degree Projects in Chemistry. For this purpose, we have analyzed the strengths, weaknesses, opportunities and threats that this type of works hold. The extracted results have allowed us to identify several aspects that can decisively affect the final outcome of the process, among them: i) The role of the supervisor along the stages of the project development and also, in the final evaluation step. ii) The collection of evidences (i.e., use of portfolios, intermediate and final assessment, rubrics and quality indicators, etc.) as indicators of the students' learning progress. iii) The use of intermediate and final opinion surveys to obtain students' feedback on the learning methodologies and the evaluation mechanisms.

1. Background of Final Degree Project in Chemistry Degree of the Faculty of Science and Technology

In higher education studies, most of the 'Final Degree Projects' (FDPs) are designed in a way in which students can: (i) compile the knowledge that they have acquired along the degree; (ii) demonstrate the abilities to apply their knowledge to solve a specific problem; (iii) improve writing and oral skills; and (iv) draw and explain the main conclusions of the work.[1] During the realization of the FDP, last year undergraduate students face applied cases that allow them to reinforce many learned concepts and skills and offers the chance to acquire new ones on collecting and processing information. FDP represents an excellent opportunity for applying and testing inquiry/research based learning/teaching methodologies.

During this process, supervisors play a key role in the teaching/learning process. Owing to the specific characteristics of the subject, many lecturers of different knowledge areas are often involved in the supervision and evaluation of FDPs. The use of a shared and coordinated teaching/evaluating framework among the different supervisors may help equally assessing the students' abilities and knowledge.[1] To this end, the feedback from the supervisors about the learning process (in the context of FDP) and what the supervisors expect students to gain from it may enrich the conceptual thinking of the teaching/learning process and the way the whole work is evaluated.[2] Moreover, the continuous assessment of the teaching/learning process should strengthen the capacities of inquiry, problem resolution and innovation, leading a substantial improvement of the students' abilities[3].

In the last 5 years, more than 300 students have successfully carried out and disserted FDPs in Chemistry degree of the Faculty of Science and Technology (ZTF/FCT) of the University of the Basque Country (UPV/EHU). Currently, designated panels evaluate the final inform and the dissertation defense of the FDP presented by the students. Up to now, aiming to evaluate all the works in an unbiased way, the projects are evaluated and graded only at the end of the process (final evaluation) by panels (without tutor) that follow a common criteria adopted by the Faculty.[4,5] However, the items included in the common rubric together with the high number of different evaluation panels designated in each academic year often hinder an unbiased grading. Moreover, this procedure, as the members of the panels are not directly involved in the project development, cannot efficiently evaluate the knowledge gained by the students and, probably, fails to provide a global view of the teaching/learning process. Under this scenario, the design of methodology and assessment tools that assure an unbiased, homogeneous and traceable evaluation[6] and that strengthen the knowledge transference along the FDP period is crucial.

In this framework, the main aim of the present work is to analyze the actual state of the teaching/learning methodology and evaluation system used in the FDPs realized in the degree of Chemistry of the ZTF/FCT of the UPV/EHU.

2. Drawing methodologies to improve teaching – learning process and assessment in the final degree project

Until now, most of the works (close to 95%) are experimental and related to research projects that aim to solve real problems. Regardless the type of work, the mentoring of the tutor, the time dedicated by the students to solve a specific problem or to look for information contributes to reinforce the students' knowledge. In order to analyze the problems and benefits of the teaching-learning methodologies used along FDPs, we carried out a SWOT (*strengths, weaknesses, opportunities and threats*) analysis of the FDPs in Chemistry (see Table 1).

Overall, we stated that the FDPs contributes: (i) to reinforce the knowledge of the students, (ii) to detect gaps in the learning process, (iii) to promote a continuous monitoring of the learning process, (iv) to provide feedback about the training-formation that the students have received and (v) to motivate the students. However, we also detected some hot spots that need a further effort. In fact, there are some aspects that can decisively affect the final outcome of the process, such as: (i) Unequal attention given by the tutors to the students. (ii) The lack of coordination among the different tutors and knowledge areas. (iii) Biased teaching-learning planning, methodologies and evaluation. (iv) The lack of real continuous evaluation system and, (v) the lack of resources and recognition that may end-up discouraging tutors.

Table 1

SWOT analysis of the actual state of the Final Degree Project in Chemistry of the Faculty of Science and Technology of the University of the Basque Country

Weakness	Description
Biased teaching-learning planification	How supervisors teach and what they expect the student to gain
	Lack of coordination among supervisors and different knowledge areas
	Lack of recognition of the supervisor's work
	Lack of student opinion over supervisor mentorship
Biased teaching-learning methodology	Unequal dedication time among the students on the FDP
	Unequal dedication time among the supervisors on the FDP
	Unequal teaching-learning methodology used among the supervisors
Biased evaluation	Final evaluation
	High percentage of the mark assigned to formal aspects according to actual rubrics
	Similar marks regardless the workload and quality of the FDP presented
	Supervisor report made only at the final stage of the FDP and not equally fullfilled among the supervisors
	Too many different jury panels in the same academic year
Threats	**Description**
University legislation	Lack of resources
	Lack of recognition of the supervisor's work
	Non-binding supervisor report
Unmotivated supervisors	Lack of support of 100% of the teaching staff
	Weak FDPs: routine, easy and bibliographic works
	Low requirement level
Unmotivated students	If the teaching-learning process is not efficient the students can become unmotivated
Strengths	**Description**
Students' high satisfaction level	Good experience, knowledge maturity
	Great involvement and exploitation of FDP
	Initiation in research/company and opportunities to see chemistry from another perspective
Large variability of projects	Large variability, many of them experimental and 18 ECTS credits to perform the work
Tutoring	High percentage of teachers involved in personalized tutoring of FDPs
Opportunities	**Description**
Cross curricular capacities	Supervisors can detect lack of capacities and solve them during the Degree
	Supervisors can assess and grade through a continiuous evaluation
Specialization	Students can use advanced intrumentation
	Students can get initiated in reasearch and company activities
Knowledge maturity of the students	Students can reinforce their specific and cross curricular capacities

Based on the above results, we focused on identifying several aspects that can decisively affect the outcome of the process, such as: (i) The role of the supervisor along the stages of the project development and also, in the final evaluation step. (ii) The collection of evidences (i.e., use of portfolios, intermediate and final assessment, rubrics and quality indicators, etc.) as indicators of the students' learning progress. (iii) The use of intermediate and final opinion surveys to obtain students' feedback on the learning methodologies and the evaluation mechanisms.

3. Preliminary Outcomes and Results

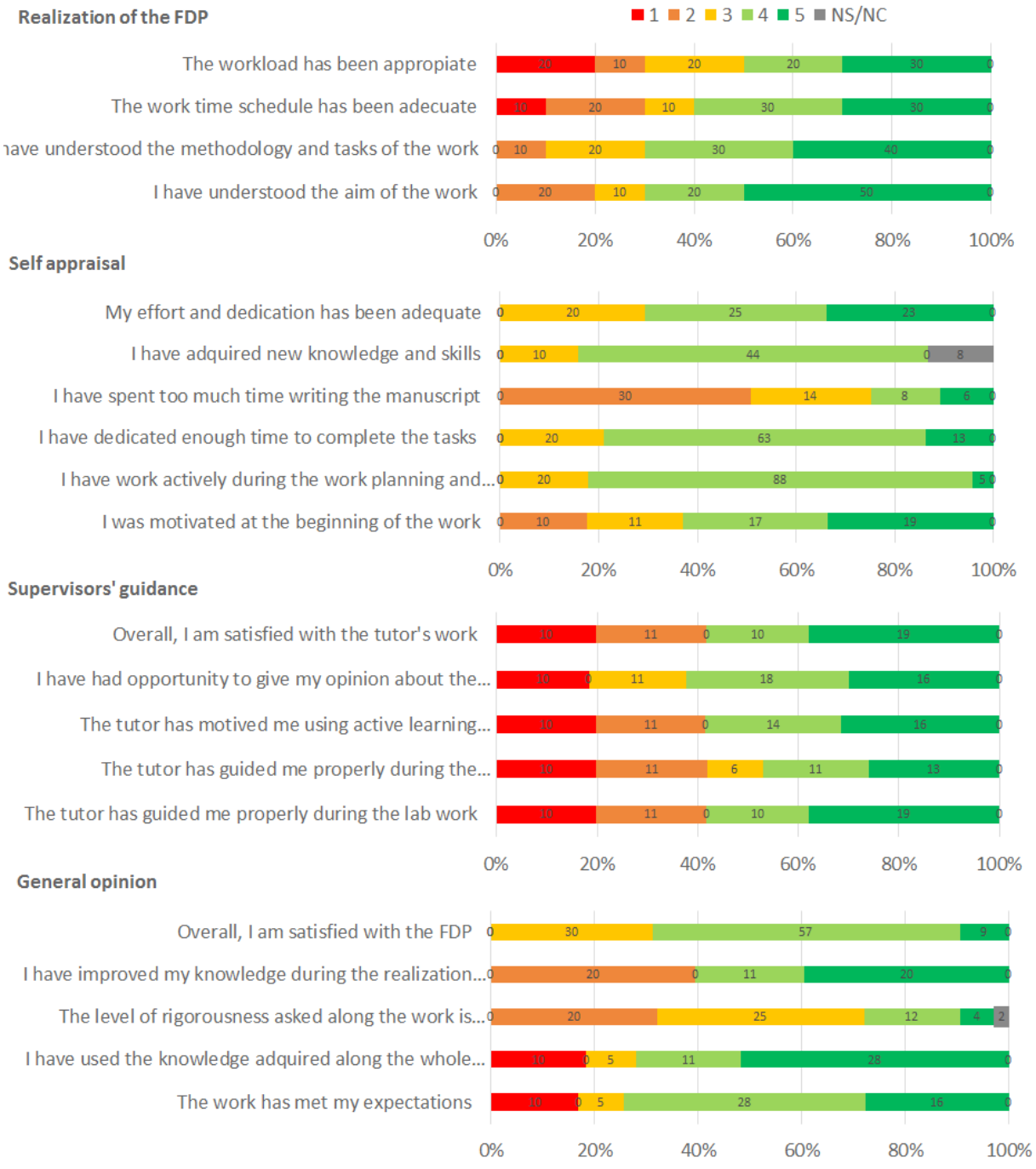
The coordination among the supervisors and the establishment of supervisors' role during the development of the FDP and the further evaluation are key to assure both an unbiased teaching-learning process and grading. All learning processes involve students' personal effort but, since motivation is an essential aspect to maintain the effort required for learning, the continuous feedback and guidance of the supervisor in some stages of the work may be beneficial. Some key points that supervisors may focus on to favor an effective learning process during the execution of the FDP are: (i) the proper definition and contextualization of the aim of the work, (ii) lab work training, (iii) the guidance of results' interpretation, and (iv) continuous feedback. The evaluation of the work is another key point in which the tutor may be involved since he/she has the whole information about the student's overall progress.

Currently, in order to solve the above-mentioned items, supervisors complete a final report containing short and specific questions about some of the skills gained by the students. However, this way, the members of the jury end-up evaluating only the final work and dissertation defense, and hence, the students' work performed during the whole process is set aside. Under this scenario, we propose the collection of evidences in order to improve the evaluation process and the teaching-learning process in the FDP. On the one hand, we have proposed a new supervisor's report template that includes specific items related with the specific work realized during the FDP providing more insights about the students' abilities and knowledge. Moreover, as proposed by Estapé-Dubreuil and coworkers,[7] first, intermediate and final assessment of the teaching-learning process, can provide more evidences of the continuous learning process. The collection of evidences by means of portfolios, where the students' can include all the evidences that they consider (i.e., bibliography used, lab planning, notes, etc.), is another strategy that we propose in order to have more indicators of the students' learning progress.

Finally, we propose the use of intermediate and final opinion surveys to obtain students' feedback on the learning methodologies and the evaluation mechanisms in order to know how the FDPs are ongoing. In brief, supervisors can deduce if the students are motivated and satisfied with the teaching methodology used. In this regard, although the results should be taken with caution (i.e., we have only the feedback of 12 students that have presented their work in an extraordinary call), we can take the first conclusions of the first opinion surveys done (examples of some questions and results in Figure 1). Overall, the students are satisfied with the FDPs, not only with the methodology but also with the evaluation system. However, they ask for more unbiased works in terms of dedication, similar teaching methodologies used by the different supervisors and coordination among the different supervisors.

Figure 1

Results of the final opinion survey to obtain student's feedback on the learning methodologies and the evaluation mechanisms



4. Conclusions

The coordination among several FDP supervisors and evaluators of different knowledge areas in Chemistry has identified the weak and strong points involved in the teaching/ learning process associated to Final Degree Projects. To counterbalance the weak points

detected, we propose some changes in the teaching/learning process. First, we have defined some key points that supervisors may focus on to support an effective learning process during the execution of the FDP in order to compensate the biased teaching/ learning planification and methodology. Second, we have proposed a new and more specific supervisor's report template in order to act on the biased evaluation and, finally, we propose the use of intermediate and final opinion surveys to obtain students' feedback on the learning methodologies and the evaluation mechanisms. We believe that all these actions could improve the teaching-learning progress during the FDP as well as provide a more fair and realistic evaluation. From this background, we intend to understand the needs and demands of students and supervisors for a better exploitation of all the benefits that a FDP entails (apply their knowledge in practical cases and form future researcher and professional chemists, respectively), being this the main motivation and support of this project and research.

Acknowledgments

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Project-Based Learning in higher education: an experience in Applied Economics

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Resumen

El objetivo de este estudio es presentar una experiencia en la implementación del método de Aprendizaje Basado en Proyectos (ABP) en la asignatura de Políticas y Sistemas de Innovación, asignatura optativa de 5 créditos perteneciente al Minor Personas e Innovación del Grado de Administración y Dirección de Empresas (GADE) de la Facultad de Economía y Empresa (sección Guipúzcoa) de la UPV/EHU.

El perfil alumnado en esta asignatura se caracteriza por una alta heterogeneidad debido a que se oferta a estudiantes de 3º y 4º curso de las líneas de castellano y de euskera. Esta heterogeneidad se ha incrementado significativamente en los tres últimos cursos debido al aumento de estudiantes del programa Erasmus. Las diferencias culturales y formativas del alumnado y la naturaleza de la asignatura (optativa) proporciona un contexto idóneo para la aplicación del ABP. La experiencia se llevó a cabo en el curso 2018-2019.

El resultado de la experiencia fue altamente positivo, tanto en los resultados académicos como en la percepción del alumnado sobre su proceso de aprendizaje. El alumnado mostró una implicación y un interés significativamente mayor por la asignatura que en cursos anteriores. Revelaron que esta experiencia les permitió asentar los conocimientos teóricos, relacionar conocimientos de diversas asignaturas y mejorar las estrategias colaborativas.

Abstract

The aim of this study is to present an experience in the implementation of the Project Based Learning (PBL) method in the field of Applied Economics, specifically in the subject Innovation Policies and Systems. This subject is taught at the Faculty of Economics and Business-Gipuzkoa (University of the Basque Country) from the 2012-2013 academic year.

Recently, the subject has experienced a significant increase of foreign students with different levels and academic specialties. This tendency fostered a reflection on the most suitable approach to empower students to optimize and guide their own learning process. The result of this reflection was the application of the methodology of PBL.

A novelty of this experience has to do with the potential of the PBL, which allows students to interact with others with different backgrounds since it contributes to increase students' motivation and interest in their own learning process. Additionally, it boosts collaboration and the exchange of knowledge between students with different academic and cultural traditions.

The result of the experience was highly positive, both the academic results and the perception of the students about their learning process. Students showed a significantly higher involvement and interest in the subject than in previous courses. They revealed that it allowed them to settle theoretical knowledge, relate knowledge of different subjects and improve collaborative strategies.

1. Introducción

El ABP se define como "un enfoque instructivo que contextualiza el aprendizaje presentando a los alumnos problemas para resolver o productos para desarrollar" (Moss y Van Duzer, 1998). Es un enfoque que enfatiza el aprendizaje a través de actividades centradas en el estudiante, quien aborda investigaciones, integra teoría y práctica y aplica conocimientos y habilidades para desarrollar una solución viable a un problema real (Srikrai, 2008; Ponpoon, 2017):

Con esta metodología los estudiantes pueden desarrollar capacidades (resolución de problemas, creatividad, trabajo en equipo y lenguaje) en diferentes etapas del trabajo (Brunetti *et al.*, 2003; Solomon, 2003). La participación de los estudiantes en un entorno de aprendizaje activo es uno de los elementos destacados de esta metodología. (Zacharias y Barton, 2004). Muestran sus habilidades para planificar, gestionar y realizar proyectos y otras habilidades transversales (Kloppenborg y Baucus, 2004). Requiere una gran interacción entre el entorno, el contenido, los materiales, el profesor y el alumno. Los estudiantes asumen la responsabilidad de su propio aprendizaje y trabajan en colaboración con otros (Cole *et al.*, 2002; Saban, 2000). La autonomía necesaria durante el proceso y la toma decisiones les permite mejorar su pensamiento crítico y la capacidad de síntesis, aumentando su motivación y habilidades de predicción.

Últimamente han aumentado las investigaciones sobre el ABP en diferentes entornos de aprendizaje. Algunos autores concluyen que este enfoque ha contribuido positivamente a la mejora académica del alumnado (Cengizhan, 2007; Selçuk, 2010), al aprendizaje autónomo (Chang y Tseng, 2011), a su personalidad académica (Korkmaz y Kaptan, 2002), a un aprendizaje significativo en cursos de ciencias (Kanter, 2010; Krajcik *et al.*, 2008) o a su actitud hacia los cursos de ciencias (Tortop y Özek, 2013). Hung *et al.* (2012) sugieren que el ABP asistido por tecnología mejora la motivación, el aprendizaje y la capacidad para resolver problemas. Otros estudios, sin embargo, afirman que este enfoque no tiene un efecto significativo en la mejora del rendimiento académico (Ayan, 2012; Chang y Tseng, 2011).

2. Aplicación de nuevos enfoques de enseñanza-aprendizaje: ABP

La asignatura Políticas y Sistemas de Innovación es una asignatura optativa ofertada a estudiantes de 3.er y 4.º curso con una marcada dimensión aplicada.

En la docencia de esta asignatura, el peso de los métodos tradicionales de enseñanza fue dando paso progresivamente a metodologías de aprendizaje que fomentaban el trabajo colaborativo. En paralelo, se observó un aumento de la heterogeneidad del alumnado, con una presencia creciente de estudiantes extranjeros con diferencias culturales y distintos niveles académicos y especialidades. Esta tendencia propició una profunda reflexión sobre el enfoque de enseñanza-aprendizaje más adecuado para potenciar que los/as estudiantes optimizaran y guiaran su propio proceso de aprendizaje. La metodología que se consideró más adecuada fue la denominada ABP.

La experiencia se llevó a cabo en el curso 2018-2019. El grupo estaba formado por 20 estudiantes de los cuales 18 procedían del programa Erasmus. Los países de origen eran Chile, Uruguay, Francia, Irlanda y España.

La aplicación práctica, de forma resumida, fue la siguiente:

1. **Escenario y Enunciado del proyecto**

Eres una persona graduada en ADE y formas parte del Servicio de Estudios del Departamento de Innovación, Investigación y Universidades del Gobierno. Una de las líneas de trabajo del departamento es redefinir la estrategia de innovación de la industria del país para hacerla más competitiva. Para ello, la responsable del Departamento ha solicitado un informe que contenga:

a) Versión actualizada del sistema de innovación (SI) del país/región (elegido por los/las estudiantes).

b) Descripción de los agentes que participan en el SI y de las políticas de innovación en marcha.
c) Valoración justificada sobre las fortalezas/debilidades del SI.
d) Valoración sobre el tipo de intervención pública que sería más adecuada, asumiendo que el presupuesto para el periodo siguiente se incrementará en un 5%.

Dispone de 6 semanas para realizar el informe.

2. **Fuentes de información**

La información básica dependerá del país. Los subsectores que componen el SI de un país/región puede encontrase en los materiales del curso. Las fuentes bibliográficas utilizadas deben seguir las normas APA.

3. **Contexto de la asignatura**[1]

La aplicación del ABP en esta asignatura está justificada porque la búsqueda e interpretación de información es una actividad natural del profesional economista tanto en el ámbito público como privado (ejercicio libre de la profesión, consultorías o empresas de servicios a las empresas).

Los resultados de aprendizaje esperados son:

— Extraer información relevante sobre una situación/acontecimiento real e interpretarla en términos de innovación y competitividad.
— Emitir juicios razonados y tomar decisiones sobre cuestiones relevantes con capacidad crítica.
— Analizar la información desde diferentes perspectivas: razonamiento verbal, analítico y gráfico.
— Desarrollar la comunicación escrita elaborando informes claros y coherentes.
— Trabajar en equipo, con responsabilidad, iniciativa y liderazgo.

4. **Entregables**

El alumnado se agrupa en grupos de 4 personas y deben realizar un entregable parcial y un informe final, debiendo incluir las referencias bibliográficas usadas. El informe final escrito irá acompañado de una presentación oral.

5. **Evaluación**

La tarea supone el 50% de la calificación final, del cual el 20% corresponde al informe sobre la gestión del grupo y el plan de trabajo y el resto al informe final.

[1] El alumnado es informado del tiempo (presencial y no presencial) estimado que llevará el trabajo (60 horas), de las competencias, así como de otras disciplinas involucradas (Estadística, Estructura Económica, Sociología de la Empresa y Sistemas Informáticos de Gestión Empresarial).

3. Conclusiones

El resultado de la experiencia fue altamente positivo. La tasa de aprobados fue por primera vez del 100%. El alumnado mostró un interés mayor por la asignatura que en cursos anteriores y su implicación fue también superior. Colaboraron en proyectos con alto grado de realismo adquirieron de forma más natural las competencias esperadas.

Las entrevistas mantenidas con los estudiantes sobre el impacto que la metodología ABP había tenido sobre su aprendizaje fue muy positiva. Revelaron que les permitió asentar los conocimientos teóricos, relacionar conocimientos de diversas asignaturas y mejorar las estrategias colaborativas. Esta metodología permitía, además, una relación más próxima con el profesorado. No obstante, una parte del alumnado señaló la dificultad de realizar el plan de trabajo y la distribución de tareas al inicio del Proyecto por falta de tiempo y de experiencia previa. Otro problema tenía que ver con las fechas de las presentaciones orales, fijadas en las últimas sesiones del cuatrimestre. Algunos alumnos regresaban con anterioridad a sus países de origen, alterando algunas fases de la planificación. Por ello, se está considerando desplegar el potencial de otras herramientas colaborativas digitales como el Blackboard o el Webinnar para enriquecer las competencias adquiridas con el proyecto y resolver estas cuestiones de agenda.

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Construcción de la identidad docente desde la creación artística

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Resumen

Esta experiencia se ha llevado a cabo en la asignatura de música de segundo curso del Grado de Educación Primaria durante los cursos 2017-18 y 2018-19. Se trata de una actividad en la que los estudiantes elaboran un proyecto artístico que debe adaptarse a un contexto escolar real; concretamente hará referencia al grupo-clase de educación primaria en el que realizan su período de prácticas de manera simultánea al desarrollo de la asignatura.

Con la actividad se pretende favorecer que los estudiantes vayan construyendo su identidad docente a partir de la adquisición de competencias de expresión y creación artística, así como de observación y análisis de contextos escolares. En definitiva, se pretende contribuir a la construcción de una identidad docente creativa que adaptándose a la realidad sea capaz de utilizar recursos artísticos para mejorar el aprendizaje del alumnado de primaria en aras de una educación integral.

Para ello, los estudiantes del grado elaboran propuestas didácticas para el alumnado de educación primaria, desde un planteamiento interdisciplinar que integra contenidos de diversas áreas a partir de la expresión artística. Desde la asignatura de música se han facilitado numerosos recursos expresivos. El proyecto se ha llevado a cabo en pequeños grupos y el seguimiento de cada uno se ha realizado en los seminarios de la asignatura.

Finalmente cada grupo de estudiantes ha presentado el resultado en el aula universitaria: un vídeo artístico en el que promocionan su proyecto didáctico complementado con una actuación escénica en directo y un documento escrito que pueda servir de guía de trabajo para el maestro de la escuela.

Los resultados reflejan un avance en las competencias creativas y expresivas de los estudiantes del grado así como una toma de conciencia real de las posibilidades que las actividades artísticas proporcionan para el aprendizaje significativo del alumnado de primaria aunque, en ocasiones, muestran una escasa adaptación de las propuestas del alumnado del grado universitario al contexto escolar y al rol del maestro e indican un nivel incipiente en el desarrollo de su identidad docente.

Abstract

This experience has been carried out in the subject of music of the second year of the Degree in Primary Education during the courses 2017-18 and 2018-19. In this activity the students develop an artistic project which must be adapted to a real school context; specifically it will refer to the group-class of primary education in which they carried out their internship period simultaneously with the development of the subject.

The aims are to encourage students to create their teaching identity from the acquisition of artistic expression and creation skills, as well as observation and analysis of school contexts. In fact, the purpose is to contribute to the construction of a creative teaching identity that, adapting to reality, is capable of using artistic resources to improve the learning of elementary students in order to achieve an integral education.

For this, the students of the degree elaborate didactic proposals for the students of primary education, from an interdisciplinary approach that integrates contents of different fields from the artistic expression. Since the subject of music, many expressive resources have been provided. The project has been carried out in small groups and the follow-up of each one has been done in the seminars of the subject.

Finally, each group of students has presented the result in the university classroom: an artistic video in which they promote their didactic project complemented by a live stage performance and a written document that can serve as a working guide for the school teacher.

The results reflect an advance in the creative and expressive competences of the students of the degree and, also, a real awareness of the possibilities that the artistic activities provide for the significant learning of the elementary students. However, sometimes they show a poor adaptation of the proposals of the students of the university degree to the school context and the role of the teacher and indicate an incipient level in the development of their teaching identity.

1. Introducción

La experiencia que se presenta se ha llevado a cabo en la Facultad de Educación de Bilbao durante los cursos 2017/2018 y 2018/2019, en la asignatura *Música en Educación Primaria* que se imparte en el segundo curso del Grado Educación Primaria.

Se trata de una actividad en la que el alumnado universitario elabora un proyecto artístico que engloba diferentes tipos de expresión y va dirigido a los estudiantes de los diferentes cursos de Educación Primaria, con los que realizarán su período de prácticas obligatorias simultáneamente al desarrollo de la asignatura de música. El profesorado en formación realizará el trabajo en grupo y de manera cooperativa, bajo la supervisión de la profesora de música y deberá adecuar su proyecto al contexto real de la escuela.

2. Marco teórico

A lo largo de su recorrido, el alumnado de magisterio evoluciona progresivamente en la manera de situarse en el contexto educativo. Su itinerario formativo se desarrolla desde una doble vertiente en la que partiendo de su rol como estudiante va construyendo la propia identidad docente. En este proceso el estudiante se sitúa de manera diferente en la escuela desarrollando la capacidad de observar y analizar la realidad desde una nueva perspectiva. Así mismo incorpora conocimientos y recursos para el desempeño de la labor docente. Finalmente toma conciencia de su función facilitadora de contextos de aprendizaje y de apoyo al proceso evolutivo de los niños y niñas.

La formación del docente, además del "saber", del "saber hacer" y del "saber cómo hacer" incluye el proceso de construcción de la identidad. El ejercicio de la docencia requiere un posicionamiento personal y profesional consciente del docente consigo mismo y con su alumnado y conforma su identidad durante el proceso de formación inicial. En este proceso el aprendizaje basado en la experiencia práctica tiene un papel fundamental, así como la auto-reflexión y la comparación individual y colectiva de experiencias (Bajardi & Alvarez, 2013).

Así mismo, existen trabajos de investigación sobre la formación del profesorado desde la perspectiva de investigación en la acción (Hernández y Ventura, 2010) y ensayos que confirman las oportunidades del desarrollo de un trabajo cooperativo (Johnson, Johnson & Holubec, 1994) donde los estudiantes aprenden conjuntamente y cada aportación individual resulta necesaria.

También se han realizado investigaciones tanto desde la perspectiva de los docentes en formación como desde el desarrollo profesional de aquellos que trabajan por proyectos en sus aulas (Travé, Pozuelos y Cañal, 2006).

Por otro lado, se debe tener en cuenta que las disciplinas artísticas, fomentan el desarrollo de la identidad docente porque contribuyen a desarrollar la expresión, la comunicación verbal y no verbal, el aprendizaje significativo y el intercambio de experiencias (Bajardi & Al-

varez, 2013). Por lo tanto, se puede afirmar que proyectos como el que se presentan, posibilita una vivencia musical práctica del alumnado y su posterior reflexión sobre lo vivido.

Además, en el área de música, la actitud de escucha necesaria para una audición en profundidad contribuye de manera poderosa al desarrollo de capacidades de observación y respeto (Gustems & Pujadas, 2008) tan necesarios en el desempeño de la labor docente. Así mismo la expresión musical posibilita aunar la expresión individual y la colectiva y contribuye de manera natural a la coexistencia de la identidad individual y la pertenencia al colectivo.

Finalmente, la música y las disciplinas artísticas contemporáneas en general son versátiles y capaces de integrar contenidos de diversas áreas de conocimiento de manera fluida, facilitando su asimilación. No en vano, vivimos rodeados permanentemente de estímulos sensoriales y artísticos presentes en los diversos ámbitos de la actividad humana. Las fronteras entre la expresión artística y la vida cotidiana son difusas en muchas ocasiones. (Begonya Folch & Raventós, 2010) En este contexto los niños y niñas han de hacerse sensibles y ser conscientes de esta realidad aprendiendo a identificar sus claves. La escuela no puede estar ausente del contexto cultural y ha de proporcionar al alumnado los recursos que le permitan desenvolverse adecuadamente en la sociedad. En este sentido, el futuro docente tiene que aprender a utilizar adecuadamente los recursos artísticos y aprovechar sus ventajas para conectar contenidos diversos en los procesos de aprendizaje. De esta manera el aprendizaje se construye a partir de experiencias que se viven de manera global.

3. Contexto

La asignatura *Música en Educación Primaria* tiene por objeto el desarrollo de capacidades musicales de los futuros docentes de Educación Primaria y la adquisición de competencias didácticas que les permitan la utilización e integración de la expresión musical en su futura labor profesional como docentes tutores de Primaria.

Además, esta asignatura se enmarca en el módulo "Competencias Comunicativas" que se imparte durante el primer semestre del segundo curso del Grado. Las asignaturas que conforman este módulo abordan diversas herramientas comunicativas (lenguaje verbal y nuevas tecnologías) y lenguajes artísticos como el visual y el musical.

4. Objetivo

Con la actividad se pretende favorecer que los estudiantes vayan construyendo su identidad docente a partir de la adquisición de competencias de expresión y creación artística, así como de observación y análisis de contextos escolares.

En definitiva, se pretende contribuir a la construcción de una identidad docente creativa que adaptándose a la realidad sea capaz de utilizar recursos artísticos para mejorar el aprendizaje del alumnado de primaria en aras de una educación integral.

5. Desarrollo del trabajo

A lo largo de los dos cursos han participado un total de cien estudiantes, que han presentado catorce proyectos. En el curso 2017-2018 se presentaron siete proyectos, en los que

tomaron parte cincuenta alumnos/as. Los proyectos presentados en el curso 2018-2019 fueron también siete, y participaron un total de cincuenta estudiantes.

Como punto de partida, cada grupo se ha situado en el rol de tutor/a de una clase de Primaria con unas características concretas: curso, número y perfil del alumnado, recursos materiales disponibles en la escuela, etc. A continuación, han elaborado una propuesta artística que se pudiera llevar a la práctica con dicha clase.

Para ello, los estudiantes del grado elaboran un proyecto vertebrado entorno a un tema o propuesta artística en relación a contenidos del curso. Incluye diversas propuestas didácticas para el alumnado de educación primaria, desde un planteamiento interdisciplinar que integra contenidos de diferentes áreas a partir de la expresión artística.

Desde la asignatura de música se han facilitado numerosos recursos expresivos. El proyecto se ha realizado en grupos de seis estudiantes y el seguimiento de la actividad se ha llevado a cabo en los seminarios de la asignatura.

Las propuestas artísticas desarrolladas por el alumnado recogen gran parte de los contenidos de la asignatura de música y utilizan otros recursos adquiridos en las otras asignaturas del módulo como la edición de un vídeo, de manera que también se desarrollan competencias transversales del Grado.

Finalmente, cada grupo de estudiantes ha presentado el resultado en el aula universitaria: un trabajo escrito en el que presentan el diseño didáctico del proyecto que podría servir de guía futura para el docente de la escuela; un vídeo artístico en el que han de desplegar sus recursos artísticos y cuya finalidad es la de promocionar su proyecto didáctico; y una actuación escénica en directo como breve presentación del proyecto utilizando recursos artístico-expresivos.

Se ha tratado de realizar un trabajo cooperativo en el que se lleve a cabo la interdependencia positiva con el resto de los componentes del grupo, la responsabilidad individual, la relación personal y el desarrollo de las habilidades comunicativas y sociales, así como una última reflexión grupal.

6. Resultados

Los resultados reflejan un avance en las competencias creativas y expresivas de los estudiantes del Grado, así como una toma de conciencia real de las posibilidades que las actividades artísticas proporcionan para el aprendizaje significativo del alumnado de primaria. En este sentido, muestran una mejora en el desarrollo de las competencias musicales y de las competencias transversales del Grado.

Sin embargo, en ocasiones, muestran una escasa adaptación de las propuestas del alumnado del grado universitario al contexto escolar y al rol del maestro, por lo que podemos deducir un nivel incipiente en el desarrollo de su identidad docente.

Como propuestas de mejora se plantea la necesidad de un mayor aprovechamiento del periodo de prácticas en los centros escolares, concretando medios que ayuden a focalizar la observación y análisis del contexto del aula y que posibiliten plantear posteriormente propuestas didácticas conectadas con la misma de manera más real y significativa. El profesorado en formación debe ser consciente de la necesidad de partir de las características del grupo de estudiantes y sus dinámicas internas a la hora de plantear sus propuestas didácticas grupales. Asimismo, ha de tomar conciencia de la importancia de conseguir conectar en-

tre sí a los componentes del grupo a través de la expresión compartida como primer paso, para posteriormente plantear el desarrollo progresivo de los contenidos del proyecto.

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Exploring New Virtual Educational Methodologies Applicate to Cell and Tissue Biology

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Resumen

El área de conocimiento de Biología Celular e Histología del primer curso del Grado en Farmacia y del Grado en Nutrición Humana y Dietética de la UPV/EHU, está constituida por la asignatura básica de rama Biología Celular y Tisular, impartida en el primer curso y primer cuatrimestre de ambos Grados. Esta materia representa un primer contacto con el conocimiento sobre la estructura y función de los organismos vivos en los dos grados.

Una de las competencias que los alumnos deben alcanzar en la asignatura es conocer los métodos básicos para el estudio de la célula y los tejidos humanos. En la modalidad docente de prácticas de laboratorio los alumnos tradicionalmente utilizan el microscopio óptico convencional y disponen de una serie de preparaciones histológicas en las que identifican los objetivos formativos que previamente el profesor ha explicado.

La Microscopia Virtual es un recurso metodológico alternativo a las clásicas prácticas presenciales. Esta herramienta tecnológica permite la visualización de imágenes digitales microscópicas de gran resolución a través de un ordenador, imitando la funcionalidad de un microscopio óptico tradicional.

Para poder utilizar este recurso se creó una base de datos de imágenes digitales (depósito virtual) que permite la simulación por ordenador de un microscopio óptico con software libre. La colección de imágenes y el software fueron puestos a disposición de los alumnos a través del campus virtual eGela, junto con las tareas a completar en las horas no presenciales. Además, una vez finalizadas las prácticas presenciales se diseñó una encuesta electrónica a través de eGela con el propósito de evaluar la experiencia de los alumnos en la microscopía virtual.

Los resultados demostraron que la metodología combinada del microscopio óptico en el laboratorio y el microscopio virtual ha resultado una herramienta muy útil para la visualización e interpretación de las muestras histológicas y alcanzar así los conocimientos prácticos de la asignatura.

Esta metodología permite desarrollar la competencia transversal de trabajo autónomo favoreciendo el estudio a través de una experiencia virtual que refuerza el contenido de las prácticas y posibilita el modelo de clase invertida, centrando la clase en la resolución de problemas y dudas.

Abstract

The area of knowledge of Cell Biology and Histology of the first year of the Degree in Pharmacy and Degree in Human Nutrition and Dietetics of the UPV / EHU, is constituted by the basic subject Cell and Tissue Biology, taught in the first four-month period of both Degrees. It represents a first contact about the knowledge of the structure and function of living organisms in both grades.

One of the competences that students must achieve in the subject is to learn the basic methods for the study of the cell and the human tissues. In the teaching method of laboratory practices, students traditionally use conventional optical microscopy and have a series of histological preparations in which they have to identify the training objectives previously explained by the teacher.

Virtual Microscopy is an alternative methodological resource to classical classroom practices. It is a technological tool that allows the visualization of high resolution microscopic digital images through a computer, imitating the functionality of a traditional optical microscope.

To do this, a database of digital images was created (virtual repository) that allows the computer simulation of an optical microscope with free software. The collection of images, as well as the software, were made available to the students through the virtual campus, together with the instructions for the

tasks to be completed at non attending hours of class and acting as additional material to the laboratory practices. Finally, an electronic survey was designed through eGela platform with the purpose of evaluating the students' experience in the use of virtual microscopy.

The results showed that the combined methodology of the optical microscope in the laboratory and the virtual microscope has resulted in a very useful tool for the visualization and interpretation of the histological samples and thus to achieve the practical knowledge of the subject.

This methodology allows developing the transversal competence of autonomous work favouring the study through a virtual experience that reinforces the content of the practices and enables the flipped classroom method, focusing the class on the resolution of problems and possible doubts.

1. Introducción

El área de conocimiento de Biología Celular e Histología del primer curso del Grado en Farmacia y del Grado en Nutrición Humana y Dietética de la UPV/EHU, está constituida por la asignatura básica de rama Biología Celular y Tisular, impartida en el primer cuatrimestre de ambos Grados, donde se imparten conocimientos básicos de Biología Celular e Histología General Humana. Representa un primer contacto con el conocimiento sobre la estructura y función de los organismos vivos en los dos grados. Dada su importancia como constituyente y unidad fundamental de cada uno de los organismos que nos rodean, la Biología Celular como disciplina académica se encarga del estudio de las células en lo que respecta a las propiedades, estructura, fisiología, funciones, orgánulos que la constituyen, su interacción con el ambiente y su ciclo vital. Y la Histología General Humana se refiera a un nivel de organización biológica gracias al cual las células y los componentes del espacio extracelular adquieren disposiciones estructurales y funcionales más complejas y variadas. Por ello la Histología se encarga del estudio de todo lo relacionado con los tejidos orgánicos: su estructura microscópica, su desarrollo y sus funciones.

Una de las competencias que los alumnos de los dos Grados deben alcanzar en la asignatura es conocer los métodos básicos para el estudio de la célula y los tejidos, donde el objetivo formativo es identificar células y estructuras celulares y tejidos y estructuras tisulares. La Biología Celular y la Histología son disciplinas que se han desarrollado muy en paralelo a los avances en microscopía. Por tanto, el desarrollar habilidades de reconocimiento e interpretación visual tiene gran importancia para su estudio. En estas prácticas se ven favorecidas unas competencias y habilidades para la práctica del profesional del campo de la salud: examen de la imagen o preparado microscópico reconociendo componentes celulares y tejidos; recogida de datos, análisis y razonamiento crítico; descripción, síntesis y comunicación. Mediante preguntas y problemas planteadas por el profesor, estimulando a los alumnos a la reflexión, participación y debate, se puede realizar un diagnóstico biológico e histológico e impulsar la toma de decisiones. Dentro de la modalidad docente de prácticas de laboratorio los alumnos tradicionalmente utilizan la microscopia óptica convencional y disponen de una serie de preparaciones histológicas en las que identifican los elementos celulares y tisulares que previamente el profesor ha explicado y señalado sobre sus preparaciones al comienzo de la clase. Durante las prácticas el alumno recoge en un dossier el trabajo realizado en las mismas, en el que refleja mediante esquemas y dibujos las observaciones microscópicas de cada práctica y recoge sus propias observaciones.

Un recurso metodológico complementario y/o alternativo a las clásicas prácticas presenciales con microscopios en el laboratorio es el uso de imágenes, o también llamadas láminas virtuales, de preparaciones histológicas (Glatz-Kriegery cols., 2003) mediante un microscopio virtual.

2. Materiales y métodos

La Microscopía Virtual es una herramienta tecnológica que permite la visualización de imágenes digitales microscópicas de gran resolución a través de un ordenador, imitando la funcionalidad de un microscopio óptico tradicional (Weinstein y cols., 2009).

Para ello, se ha contado con un amplio número de preparaciones originales propias del Departamento de Biología Celular e Histología teñidas con diferentes tinciones. La tinción histológica de base ha sido la hematoxilina-eosina, pero también se ha recurrido a otras muchas tinciones como PAS o el tricrómico. De entre las muestras, se seleccionaron más de 100 preparaciones histológicas, se ordenaron con el fin de mostrar de la mejor manera posible los diferentes tejidos (epitelial, conjuntivo, muscular y nervioso). Posteriormente se procedió al escaneo de las preparaciones. Todos los dispositivos de microscopía virtual de alta resolución se componen, esquemáticamente, de un sistema automático conectado al microscopio óptico, un sistema de captura mediante una cámara acoplada, un software de control del proceso de escaneado y un visor de preparaciones digitales. Además, existen otros componentes opcionales, como alimentador de preparaciones o un programa de análisis de imagen (Nelson y cols., 2012). Mediante el microscopio robotizado se va adquiriendo la información de una lámina o preparación con gran aumento (40X-100X), realizando múltiples tomas secuenciales adyacentes hasta barrer toda la preparación. Se realizó una selección exhaustiva de las imágenes y se creó una base de datos de imágenes digitales (depósito virtual) y esta librería se organizó en varias carpetas almacenadas en uno de los servidores de la Facultad, que fueron puestos a disposición de los alumnos a través del campus virtual. Para la visualización de las imágenes digitales, los alumnos disponían un link para descargarse un sofware libre que permite la simulación por ordenador de un microscopio óptico (Aperio ImageScope-Pathology Slide Viewing Software). Para cada tipo de tejido se añadía las instrucciones precisas de las tareas que debían completar utilizando esta herramienta, así como un texto explicativo para cada imagen y se señalaban distintas estructuras para facilitar su mejor comprensión. Estas actuaban como refuerzo y material adicional a las prácticas de laboratorio.

Para conocer la opinión de los alumnos sobre la utilización de las láminas virtuales junto con la microscopía óptica se diseñó una encuesta electrónica a través de la plataforma eGela.

3. Resultados

Con la metodología del microscopio óptico virtual, alternativa y adicional a la modalidad docente de prácticas de laboratorio más tradicionales, el estudiante trabaja en la sala de prácticas con mayor interés e intensidad, lee sus apuntes realizados en sus horas no presenciales de visualización virtual de las imágenes de microscopía, consulta atlas, y al mismo tiempo que mira al microscopio, con su ordenador se puede volver a conecta al microscopio virtual y realiza fotografías que utilizará posteriormente para imprimir en el guion. Su actitud es más activa y a la vez más autónoma.

Las respuestas de los alumnos a la encuesta realizada nos han permitido calcular el impacto de la microscopía virtual en el aprendizaje, resaltando que los microscopios virtuales son una herramienta eficiente para la exploración de las placas de histología, y alcanzan un 78 % de preferencia frente a la utilización de los microscopios ópticos convencionales. La ventaja que demuestran los alumnos de la utilización de los microscopios virtuales, es la libertad para explorar y estudiar las placas, lo cual mejora significativamente el proceso de aprendizaje. El alumnado ha puesto de manifiesto que el acceso al microscopio virtual es

claro y sencillo y que el uso de esta herramienta se debe de incorporar definitivamente en el futuro. También han considerado que el uso de esta herramienta es tiempo real de estudio y que el aprendizaje obtenido con ella no es superficial lo que les ha permitido fijar mejor los conocimientos adquiridos.

En base a las respuestas del cuestionario nos ha permitido definir trabajos futuros en cuanto a mejoras en la plataforma, tanto en términos funcionales, como también en contenidos, apuntando a mejorar la experiencia de los alumnos en el uso de la microscopía virtual.

Los resultados nos han demostrado que la metodología combinada del microscopio óptico en el laboratorio y el microscopio virtual ha resultado una herramienta muy útil para la visualización e interpretación de las muestras histológicas y alcanzar así los conocimientos prácticos en el marco de esta asignatura.

4. Conclusiones

La Microscopía óptica en la enseñanza de la Biología Celular y Tisular es de gran interés ya que fomenta el desarrollo de distintas habilidades que forman parte de la disciplina, como son el desarrollar habilidades de reconocimiento e interpretación visual. En estas prácticas de microscopía óptica se ven favorecidas unas competencias y habilidades para la práctica del profesional del campo de la salud: examen de la imagen o preparado microscópico reconociendo componentes celulares y tejidos; recogida de datos, análisis y razonamiento crítico; descripción, síntesis y comunicación.

El uso del Microscopio Virtual permite la creación de nuevos materiales docentes ya que los alumnos disponen de las imágenes en sus ordenadores y pueden consultarlas tantas veces como quieran. Esta metodología permite flexibilizar el tiempo y el espacio al realizarse la actividad fuera del horario presencial, favoreciendo la adquisición de competencias como capacidad de análisis y síntesis, resolución de problemas, toma de decisiones y aprendizaje y trabajo autónomo. Dentro de la enseñanza dinámica y cooperativa, la utilización de herramientas virtuales sirve como referencia y como guía para favorecer el estudio a través de una experiencia virtual que complementa y refuerza el contenido de las clases prácticas presenciales a la vez que posibilita el modelo de clase invertida (flipped classroom), permitiendo así centrar la práctica presencial en problemas de los estudiantes una vez han adquirido de una forma autónoma una base sobre la que trabajar.

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Taxonomía de vertebrados e invertebrados mediante el uso de las TICs en Biología y Geología de 1.º de la ESO

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Resumen

La aplicación de una metodología constructivista en las aulas ha adquirido a nivel internacional, gran relevancia durante la última década debida principalmente al aumento en la eficacia del proceso de enseñanza-aprendizaje que su uso conlleva. El rol activo y participativo que el discente adquiere mediante el uso de esta metodología, promueve la motivación y el aprendizaje significativo, lo que en definitiva mejora la formación integral del alumno. Asimismo, el uso de las tecnologías de la información y la comunicación (en adelante, TICs) en el aula, constituye un reto constante para los docentes de educación secundaria, que se ven en la necesidad de diseñar y/o adaptar sus unidades didácticas para integrar dichas TIC para satisfacer las necesidades educativas de sus alumnos. En el presente trabajo se ha realizado una propuesta de unidad didáctica en la que se abordan los contenidos referentes a la taxonomía de animales vertebrados e invertebrados mediante un enfoque constructivista y haciendo uso de las TIC. Así, se concatenan una serie de actividades cooperativas que responden al cumplimiento de los objetivos de un proyecto, en el que los alumnos adquieren conocimientos sobre la taxonomía animal, los cuales son reflejados en una serie de documentos finales, realizados mediante el uso creativo de las TIC. Los alumnos, en grupos heterogéneos de 4 personas, deberán realizar, por un lado, una clave dicotómica que sirva para, acorde a sus principales características morfológicas y/o funcionales, clasificar adecuadamente cualquier animal y por otro, un documento que aborde las principales características de los diferentes grupos de animales vertebrados e invertebrados, cuyas ilustraciones serán fotografías hechas por los propios alumnos. En conclusión, la telefonía móvil y el aprendizaje ubicuo (*m-learning*), adquieren un rol fundamental en la presente propuesta, puesto que los alumnos, mediante la realización de fotografías de animales y su posterior valoración y clasificación a través del documento colaborativo en línea (en horario extraescolar), se verán en la necesidad de aplicar sus conocimientos en cualquier momento de su vida cotidiana.

Abstract

The application of a constructivist methodology in the classroom has acquired, internationally, great relevance during the last decade, mainly due to the increase in the effectiveness of the teaching-learning process provided by its use. The active and participatory role that the learner acquires through the use of this methodology promotes an increase in the motivation and meaningful learning, improving the student's comprehensive education. In addition, the using of information and communication technologies (ICT) in the classroom is a constant challenge for secondary school teachers, who need to design and/or adapt their teaching units in order to include ICTs according to the educational needs of their students. In the present study it is proposed a teaching unit addressing the taxonomy of vertebrate and invertebrate animals with a constructivist approach and the using of ICT. The students will perform a series of cooperative activities in order to fulfil different objectives belonging to a general project, acquiring knowledge about animal taxonomy. The learning will be evaluated with two different final reports, which will be made using different ICT selected by the students. The students, in heterogeneous groups of 4 people, will perform two different works. On the one hand, a dichotomous key in order to classify adequately any animal, according to the main morphological and/or functional characteristics, and on the other hand, a document that summarizes the main characteristics of the different vertebrate and invertebrate animals, illustrated with photographs taken by the students themselves. In conclusion, mobile phone and ubiquitous learning (*m-learning*) have an essential role in the present unit. The students will need, after school, to find different animals, take photographs, and analyze and classify them in their taxonomical group through the online collaborative document, meaning that they will need to use and apply the obtain knowledge anytime and anywhere.

1. Metodología

La unidad didáctica diseñada se llevará a cabo mediante una metodología activa, participativa y comunicativa, utilizando para ello:

- **Clase invertida**. Se utilizará el tiempo de clase para fomentar la participación activa del alumnado y reestructurar ideas que no hayan quedado bien afianzadas después de ver los videos. Los videos serán modificados con la herramienta Ed-Puzzle para insertar diferentes preguntas a lo largo del mismo, que permitan al alumnado afianzar las ideas que en ellos se explican. El visionado de estos videos servirá de punto de partida para el trabajo por proyectos que deberán realizar en grupo.
- **Trabajo por proyectos**. Los alumnos deberán englobar las características de los distintos grupos taxonómicos de animales vertebrados e invertebrados en un documento digital que les permita, mediante su uso, clasificar cualquier animal que puedan encontrarse en su vida cotidiana. Para tal fin, tendrán que cumplimentar una serie de actividades intermedias que representarán diferentes subapartados de ese proyecto global.
- **M-learning.** Dada la alta disponibilidad a la telefonía móvil, los alumnos trabajaran cooperativamente haciendo uso del mismo. Para ello, cada grupo dispondrá de un documento colaborativo en línea (al que el docente tendrá acceso) en el que irán colgando las fotografías que vayan realizando para culminar el proyecto. El uso del teléfono móvil permitirá a los alumnos tener un acceso constante al documento colaborativo y poder realizar fotos, colgarlas, clasificarlas y valorarlas en cualquier momento y lugar.
- **Trabajo cooperativo**. Las actividades serán realizadas en grupos de 4 personas, que será el grupo de trabajo con el que los alumnos desarrollen el proyecto planteado. Asimismo, también se alternarán sesiones de debate en gran grupo. Mediante el trabajo cooperativo se fomentará el comportamiento social entre los alumnos, el trabajo en equipo, la valoración de opiniones y el respeto mutuo.

2. Resultados

La unidad didáctica diseñada esta basada en el aprendizaje basado en proyectos. Los alumnos, en grupos de cuatro y concatenando una serie de actividades diversas (trabajo personal, trabajo grupal, debates y contenido multimedia), tendrán como objetivo realizar dos productos finales que servirán al docente para evaluar su aprendizaje. Esos productos consisten en: 1. Realizar una clasificación de los seres vivos en la que se detallen las características principales de cada grupos y 2. Realizar una clave dicotómica que permita clasificar cualquier animal de forma correcta. En este proceso, el uso del teléfono móvil adquiere un rol fundamental, debido a que los documentos finales tienen que ser ilustrados con fotografías de animales que los propios alumnos realicen fuera del horario escolar. Así, los alumnos en grupos (documento colaborativo en línea) tendrán que clasificar, en base a los conocimientos adquiridos en el aula, los animales que fotografíen o encuentren en su vida cotidiana, dando lugar a la aplicación de los conocimientos adquiridos en cualquier entorno, y en definitiva a la ubicuidad en el aprendizaje.

Respecto a las actividades, partiendo de que los contenidos de la unidad pueden dividirse en dos grupos principales, que son vertebrados e invertebrados, son 4 los tipos de ac-

tividades que se han diseñado para la adquisición de conocimientos y preparación de documentos finales en cada grupo.

1. Se realizará un visionado de un video, modificado por el docente con ED puzzle. Estos videos serán visionados por los alumnos en horario extraescolar, y con anterioridad al comienzo en el aula con los respectivos contenidos.
2. En el aula, en trabajo cooperativo los alumnos realizarán la clasificación de los seres vivos, basándose en la información del video así como en la que encuentren en la red.
3. Se realizará un debate grupal para analizar en grupo la consecución del trabajo y aclarar o debatir dudas que hayan podido surgir en el proceso.
4. En horario extraescolar, y aquí es donde la ubicuidad del aprendizaje tiene cabida, y con ayuda del documento colaborativo, los alumnos tendrán que realizar fotografías con su teléfono móvil a animales que encuentren en su vida cotidiana, y clasificarlo en base a sus características, sirviendo para ilustrar sus trabajos.

3. Reflexiones

Cambiar el enfoque de las clases magistrales hacia un modelo constructivista en el que el alumno sea protagonista de su proceso de aprendizaje es una labor necesaria que todos los docentes debieran no solo de entender e interiorizar, sino también hacer efectiva En esta propuesta ha quedado demostrado como incluso los contenidos mas descriptivos y teóricos como puede ser la taxonomía puede enfocarse desde un punto de vista metodológicamente activo.

Diseñar una unidad didáctica en la que los alumnos tengan una participación activa es un requisito fundamental para suscitar su interés por el proceso de enseñanza-aprendizaje y de ese modo garantizar el aprendizaje significativo del alumno. Para ello, la integración de las TIC en el proceso de enseñanza-aprendizaje resulta indispensable.

El diseño de las unidades didácticas debe integrar el uso de metodologías y recursos diversos en el proceso de enseñanza-aprendizaje. El uso continuado de una única metodología hace que el proceso de enseñanza-aprendizaje se convierta en algo rutinario, poniendo en jaque el interés y la motivación de alumnado.

El diseño de unidades didácticas adecuadas para atender a las necesidades educativas de las aulas está sujeto a la formación continuada de los docentes, que dispongan de conocimientos actualizados y adecuados sobre metodología y estrategias didácticas que cubran dichas necesidades.

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El programa de Formación e Innovación Docente del Profesorado de la Universidad de Sevilla: Principios y Líneas de Acción

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Resumen

El Programa de Formación e Innovación Docente del Profesorado (FIDOP) de la US ha tenido una demanda inesperada y desbordante en sus 6 años de funcionamiento. Las líneas de acción que lo integran se basan en los resultados de la investigación educativa en este campo (Amundsen & Wilson, 2012; Da Silva & Guimarães, 2016), en las directrices de la UE sobre mejora de la docencia universitaria (European Commission, 2014) y en los postulados del movimiento SoTL. El FIDOP se basa en la necesidad de impulsar un modelo de docencia centrado en el aprendizaje y en el estudiante, a partir de la aplicación gradual, constante y en progresión de Ciclos de Mejora en el Aula (CIMA-Improvement Cycles in Classroom-ICIC).

Abstract

The Teacher Training and Innovation Program (FIDOP) of the US has had an unexpected and overwhelming demand in its 6 years of operation. Its 5 lines of action are based on the results of educational research in this field (Amundsen & Wilson, 2012; Da Silva & Guimarães, 2016), on European Union guidelines on improving university teaching (European Commission, 2014) and on the postulates of the SoTL movement. The FIDOP is based on the need to promote a teaching model centred on learning and the student, starting from the gradual, constant and progressive application of Improvement Cycles in the Classroom (ICIC).

1. Principios y modelo formativo del programa

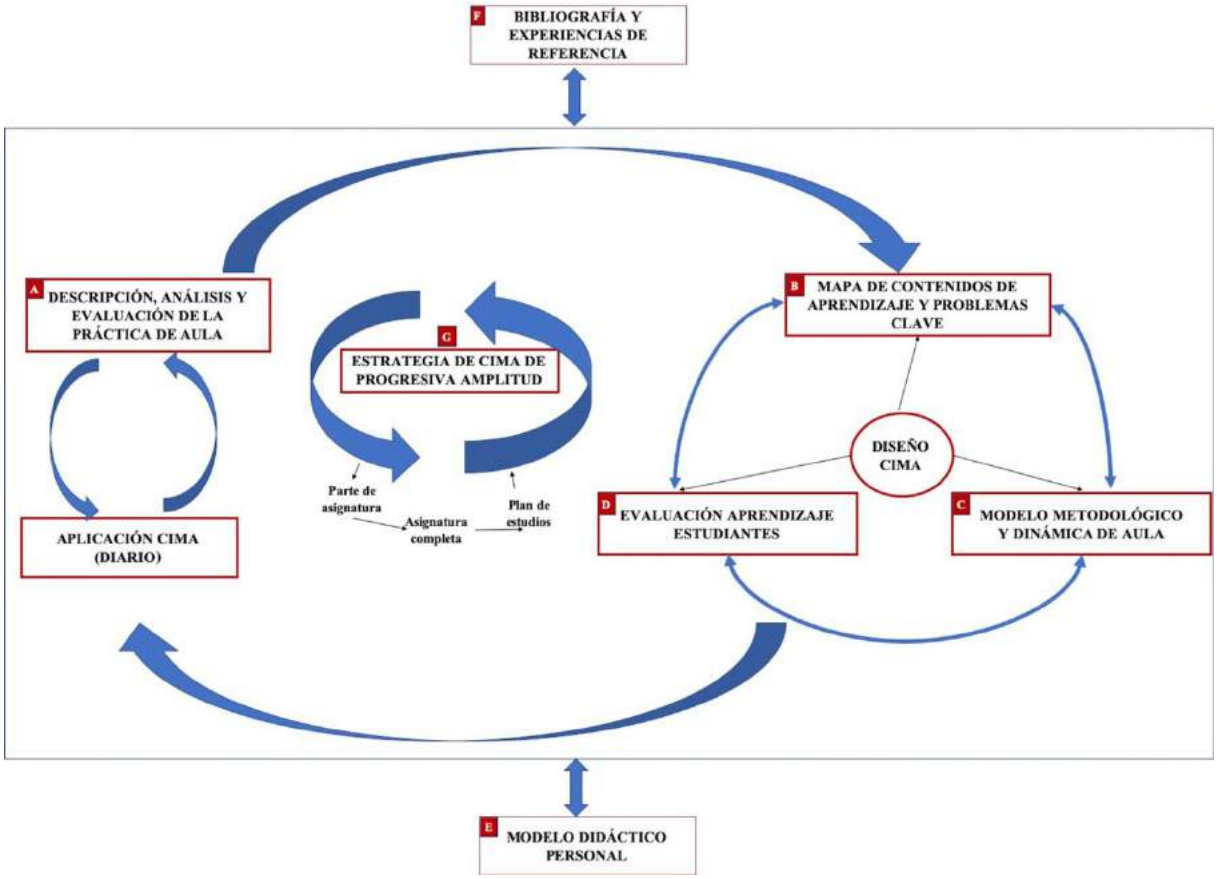
El Programa FIDOP nace en el año 2013 y tiene como objetivo promover un cambio metodológico y conceptual en el ámbito docente, de manera que el profesorado pase de un modelo centrado en la transmisión (Information Transmission/Teacher-Focused-ITTF) a un modelo centrado en el estudiante (Conceptual Changes/Student-Focused-CCSF), en coherencia con las conclusiones de las investigaciones en el campo (Gargallo, Fernández & Jiménez, 2007; Postareff, Lindblon-Ylänne & Nevgi, 2008).

Los principios del Programa pretenden el desarrollo del conocimiento práctico docente, en lo que concierne a:

- La importancia del conocimiento didáctico específico vinculado a la materia.
- El necesario proceso de transformación didáctica de los contenidos, desde contenidos de las disciplinas a contenidos para ser enseñados.
- El análisis de la propia práctica y su relación con los modelos de enseñanza-aprendizaje (contenidos, metodología y evaluación), en la perspectiva de construir un Modelo Didáctico Personal de referencia.
- El diseño, aplicación y evaluación de propuestas de intervención próximas a modelos de enseñanza centrados en el aprendizaje y en el estudiante.

El modelo formativo del Programa se basa en los Ciclos de Mejora en el Aula —CIMA— (Porlán, 2017), partiendo de que los cambios han de concretarse en la realidad y han de ser graduales, constantes y en progresión. Los CIMA se conciben desde una lógica cíclica e incluyen varias fases (*Fig. 1*).

Figura 1
Fases de los CIMA



En la fase inicial, un CIMA parte del análisis de la práctica de aula previa, describiendo el modelo real que se lleva a cabo en las clases y el modelo que se considera deseable. Esto permite tomar conciencia de las características de los contenidos que se trabajan, con frecuencia fragmentados y des-problematizados, de la metodología transmisiva predominante, que ignora los modelos mentales de los estudiantes y del tipo de evaluación finalista que se suele practicar.

Esta reflexión conduce de manera natural a diseñar una intervención experimental de mejora, para un número concreto de horas de clase, en la que se trabajan las relaciones entre los contenidos (en forma de mapas), resaltando los organizadores; se formulan problemas, casos o preguntas claves; se preparan secuencias de actividades basadas en la investigación de los estudiantes y se toma en consideración las ideas iniciales y finales de los mismos, así como su evolución durante las clases, a modo de evaluación formativa y procesual.

Este proceso continúa con la experimentación en el aula del diseño. Durante la misma los docentes llevan un diario que les permite analizar la nueva práctica, valorar sus resultados y mejorar el CIMA para el siguiente curso.

Finalmente, este proceso de ir y venir de la practica a la reflexión y al diseño de nuevas intervenciones —alimentado por bibliografía y experiencias de calidad— favorece la construcción del Modelo Didáctico Personal de cada docente.

2. Estrategia y líneas de acción del programa

Los principios y el modelo formativo descritos se materializan en una estrategia sistémica (*Fig. 2*) que confiere al Programa flexibilidad —se ofrecen diversos itinerarios formativas—, retroalimentación entre las diferentes líneas de acción y colaboración entre los docentes que ya participan y los que se acercan por primera vez.

Figura 2
Estrategia y líneas de acción del Programa

La línea fundamental es el Curso General de Docencia Universitaria (CGDU) de 100 horas de duración (50 presenciales y 50 no presenciales). Participan 20 docentes de cualquier área de conocimiento y un formador experto en Didáctica Universitaria. El trabajo de reflexión sobre la práctica y el desarrollo de dos CIMA —recogido en un portafolio— son los elementos sobre los que se construye la dinámica del curso. El intercambio de experiencias y argumentos es la forma habitual de proceder durante las sesiones.

Una vez realizado el CGDU, el profesorado puede pasar al año siguiente a la segunda línea de acción: la Red de Formación e Innovación Docente. La REFID se organiza en equi-

pos de áreas afines, asesorados por un compañero con experiencia innovadora. Cada docente debe realizar un CIMA durante el año, decidiendo el número de horas que abarca, con dos posibilidades: CIMA básico de 29 horas o menos o CIMA de asignatura completa de 30 horas o más. Siempre con un número de horas superior al CIMA del año anterior.

El profesorado de estas dos líneas participa en las Jornadas de Formación e Innovación Docente del Profesorado (línea 3), con una duración de 10 horas presenciales. El objetivo de las Jornadas es que el profesorado sintetice y comparta en forma de artículo el CIMA realizado durante el año. Los artículos producidos en el año 2018 pueden revisarse en el enlace https://editorial.us.es/es/no1-2018

Paralelamente a las líneas anteriores, se desarrollan los Cursos Específicos de Docencia Universitaria (línea 4), con una duración de entre 10 y 15 horas, en los que el profesorado puede formarse en alguno de los aspectos significativos del Programa: el análisis didáctico de los contenidos; las relaciones entre contenidos y problemas, casos o proyectos; las metodologías de enseñanza innovadoras, el diseño de actividades y recursos (incluidos enfoques TIC); la evaluación y el seguimiento de los modelos mentales de los estudiantes; la evaluación de la propia práctica… Estos cursos cumplen una doble función: para el profesorado que ha realizado las líneas 1 y 2, profundizar en aspectos ya trabajados en el CGDU y en la REFID, para el profesorado externo una puerta de entrada al Programa.

La última de las líneas (5), los Grupos de Formación e Innovación Docente de Facultades, tiene como finalidad generar dinámicas poco exigentes de participación, formación e innovación entre el profesorado de un mismo centro. Para ello, se organizan reuniones mensuales en las que participa el profesorado ya vinculado al Programa y otros docentes no vinculados, pero interesados en la mejora de su docencia.

En suma, el programa FIDOP, a diferencia de otros (De la Cruz Tomé, 2000; 2003), constituye una propuesta formativa en Educación Superior para promover cambios en las clases, posteriormente cambios docentes en las Facultades y, por último, cambios en la Universidad que reviertan en la formación de los estudiantes y beneficien al conjunto de la sociedad.

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Uso de Padlet en la educación del profesorado en formación como herramienta de aprendizaje online colaborativa: satisfacción del alumnado

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Resumen

En este trabajo se analiza la satisfacción de estudiantes universitarios acerca de la pared virtual Padlet como herramienta didáctica online. En el estudio tomaron parte 45 estudiantes de la Facultad de Educación y Deporte (UPV/EHU), en la asignatura "Ciencias de la Naturaleza en el Aula de Educación Primaria" (9 ECTS). La herramienta Padlet se usó en 4 tareas independientes, que involucraban compartir ideas y co-evaluar. El objetivo es reportar la participación y satisfacción del alumnado en el uso de Padlet. La participación fue analizada a partir de los comentarios en la pared virtual; y la satisfacción, a través de un cuestionario (9 ítems; escala Likert: 1-5). Los comentarios realizados en la pared virtual muestran que se han generado nuevos conocimientos y que ha existido interacción entre el alumnado. En cuanto a la satisfacción, el alumnado cree que Padlet le ha sido útil para compartir ideas, así como para la co-evaluación y para promover el aprendizaje colaborativo. El alumnado está de acuerdo en que ha aprendido leyendo ideas y comentarios de otros en la pared virtual. Además, les ha gustado hacer comentarios en las ideas de otros y ver comentarios en sus propias ideas. Para la mayoría ha sido la primera asignatura en la que han usado Padlet, y les gustaría ampliar su uso a otras asignaturas. En conclusión, se puede decir que Padlet ha sido una herramienta eficiente para la enseñanza porque ha permitido la interacción y colaboración entre el alumnado a lo largo del proceso de construcción de conocimiento. Además, el alumnado ha encontrado la experiencia satisfactoria, motivadora e innovadora.

Abstract

The present study reports on the students' satisfaction in using the virtual wall Padlet as an online didactic tool. Throughout the study, 45 students from the Faculty of Education and Sport (UPV/EHU) used the virtual wall within a 9 ECTS science course, "Science for the Primary Classroom". Specifically, Padlet was used in 4 independent tasks, which mainly involved sharing ideas and evaluating classmates. Learning was based on social constructivist principles. Hence, students were expected to be pro-active and collaborative. The objective was to report students' participation and satisfaction in using Padlet. The former was assessed from the virtual walls by counting and evaluating students' comments; for the latter, a student satisfaction questionnaire (9 items; Likert scale: 1-5) was used as instrument. Students' comments on the walls showed generation of new knowledge and interaction among students. Students found Padlet helpful for sharing ideas, for co-evaluation purposes and for promoting collaborative learning. They agreed that they had learnt by reading others' ideas and comments on the wall. They liked seeing their mates' comments on their ideas as well as making those comments. It was the first course in which they had used Padlet, and they would like to use it in other courses. In conclusion, Padlet was an effective tool for instruction in this teacher training degree because it enabled interaction and collaboration while constructing knowledge. Also, students found it satisfactory, motivating and innovative.

1. Introducción

El avance tecnológico no excluye a la Educación Superior, donde el uso de las tecnologías de la información y comunicación (TIC) en el aula universitaria es casi un requerimiento en el desarrollo de los procesos de enseñanza-aprendizaje (Greenhow, Robelia y Hughes,

2009). La Universidad del País Vasco (UPV/EHU), a través de su modelo educativo IKD (Aprendizaje Cooperativo y Dinámico), incorpora a las TICs como elemento básico en las estrategias de enseñanza y aprendizaje. Para ello, las herramientas digitales deben ser aceptadas tanto por el profesorado como por el alumnado.

A raíz de ello, el presente estudio aborda el uso de la herramienta colaborativa Padlet en la enseñanza-aprendizaje a nivel universitario; en concreto, se pretende evaluar la satisfacción de un grupo de estudiantes en el marco de una asignatura acerca de las Ciencias y su didáctica.

2. Marco teórico

Padlet es una herramienta World Wide Web (Web) 2.0 para la interacción entre usuarios en una pared virtual. En la propia web, Padlet se define como "un software que la gente usa para crear y compartir contenido con otros" (Padlet Blog, 2019). Sus ventajas son (Weller, 2013): funciona en cualquier dispositivo conectado a internet; es interactiva; la pared y, por tanto, su contenido, permanece en el tiempo; pueden postearse documentos y archivos multimedia; no se necesita instrucción para comenzar a usar la aplicación; es gratuita (número de paredes por usuario limitado); y puede usarse como herramienta colaborativa.

Un estudio realizado por Dewitt, Alias y Siraj (2015) sitúa a Padlet como herramienta de gestión del conocimiento o knowledge management (Kappes y Thomas, 1993), es decir, el alumnado que participó en dicho estudio, a través de Padlet, adquirió, compartió, internalizó y aplicó conocimientos mientras generaba nuevos conocimientos. Esto también ha sido confirmado por Biasutti y El-Deghaidy (2012) para la herramienta Wiki.

En lo que se refiere al uso de herramientas Web 2.0 en la educación universitaria, Kid (2013) posiciona al profesorado en formación como agentes potenciales de cambio cultural y tecnológico en las escuelas a través de herramientas Web 2.0. De hecho, el profesorado en formación debe abordar la Web 2.0 desde dos frentes, el aprendizaje en la preparación como docente y su aplicación en el aula futura (Albion, 2008). Por ello, la mejor forma que el alumnado aprenda Web 2.0 es aprender usando Web 2.0. Entre sus características a mencionar, destaca la participación y el potencial de facilitar tanto la interacción entre docentes y alumnado como la co-creación de contenido (Greenhow, 2007).

3. Metodología

En este estudio se usó la pared virtual Padlet como herramienta online de aprendizaje colaborativo en el marco de la asignatura "Ciencias de la Naturaleza en el Aula de Educación Primaria" (9 ECTS). Durante su implementación, se analizó el proceso de aprendizaje con el objetivo de evaluar la participación y satisfacción del alumnado.

La herramienta Padlet se usó en 4 tareas independientes, cuyos objetivos fueron compartir ideas, llegar a acuerdos respecto a dichas ideas y co-evaluar las ideas de las y los compañeros. Para ello, el alumnado se dividió en grupos y usó su ordenador portátil o dispositivo móvil, conectados a la red wifi de la UPV/EHU. El tiempo dado para que cada grupo compartiese su idea en la pared virtual fue de 10 minutos; para la co-evaluación, que se llevó a cabo a través de la opción "comentarios", los grupos dispusieron de 20 minutos.

La satisfacción del alumnado se evaluó a través de un cuestionario (9 ítems; escala Likert: 1-5), modificado a partir del cuestionario desarrollado por Biasutti y El-Deghaidy

(2012) para la herramienta Wiki. La participación del alumnado fue voluntaria y anónima. Así, la muestra la componen 45 estudiantes de la Facultad de Educación y Deporte de la UPV/EHU. También se evaluó la participación del alumnado; dicha tarea consistió en analizar los comentarios expresados en la pared. El aprendizaje se basó en el socio-constructivismo, por lo que se esperaba que los estudiantes fuesen proactivos y colaborativos.

4. Resultados y discusión

Respecto a la participación del alumnado en la realización de comentarios con el objetivo de llegar a acuerdos y co-evaluar las ideas de las y los compañeros, la participación de los grupos muestra que ha existido interacción entre el alumnado: el número de comentarios totales por pared (Tabla 1) varía desde 17 (promedio de 3.4 comentarios por grupo) hasta 112 (promedio de 9.33 comentarios por grupo).

Tabla 1

Participación del alumnado en Padlet medida como número de comentarios

Padlet	N.º mínimo de comentarios por idea	N.º máximo de comentarios por idea	N.º de comentarios totales en el Padlet	N.º comentarios/ N.º grupos
1	1	7	65	3.82
2	0	3	20	1.67
3	7	13	112	9.33
4	4	7	54	3.66

En cuanto a la satisfacción (Tabla 2), el alumnado cree que Padlet le ha sido útil para compartir ideas (ítem 3), así como para promover la co-evaluación (ítem 7) y el aprendizaje colaborativo (ítem 6). Las y los estudiantes están de acuerdo en que han aprendido leyendo ideas y comentarios de otros en la pared virtual (ítem 5). Además, les ha gustado hacer comentarios en las ideas de sus compañeros y compañeras (ítem 2) y ver comentarios en sus propias ideas (ítem 1). Y creen que todo ello les ha llevado a generar acuerdos sobre dichas ideas (ítem 4). Para la mayoría ha sido la primera asignatura de Ciencias en la que han usado Padlet (ítem 9), y les gustaría ampliar su uso a otras asignaturas (ítem 8).

Como se observa en la Tabla 2, la media de satisfacción de los ítems 1 a 8 es alta (rango: 3.40-4.13), correspondiendo la máxima puntuación al ítem "Padlet me permite compartir ideas con mis compañeros y compañeras". Este mismo ítem fue el más valorado en el estudio realizado por Dewitt, Alias y Siraj (2015) sobre el aprendizaje colaborativo y el uso de Padlet en estudiantes universitarios.

Tabla 2
Satisfacción del alumnado medida a través de un cuestionario con 9 ítems (media y desviación estándar)

Item	Descripción	$\bar{X}$	SD
1	Me ha gustado ver los comentarios de mis compañeras y compañeros de clase en las ideas que he escrito	3.69	0.90
2	Me ha gustado realizar comentarios a mis compañeras y compañeros de clase	3.53	0.94
3	Padlet me ha ayudado a compartir mis ideas con mis compañeras y compañeros de clase	4.13	0.73
4	Gracias a Padlet la clase ha sido capaz de llegar a acuerdos	3.40	0.91
5	He aprendido de las ideas y comentarios del resto de mis compañeras y compañeros en Padlet	3.98	0.75
6	Padlet impulsa el aprendizaje colaborativo	4.04	0.74
7	Padlet ha sido útil para realizar coevaluaciones	4.11	0.68
8	Me gustaría utilizar Padlet en otras asignaturas	3.67	1.00
9	Es la primera vez que uso Padlet en una asignatura de Ciencias	4.62	0.98

5. Conclusión

En conclusión, Padlet ha sido una herramienta eficiente para la enseñanza y el aprendizaje porque ha permitido la interacción y colaboración entre el alumnado a lo largo del proceso de construcción de conocimiento. Además, el alumnado ha encontrado la experiencia satisfactoria, motivadora e innovadora.

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Aportes al aprendizaje de estudiantes de Enfermería con la implementación de una modalidad B-Learning en un curso teórico de enfermería

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Resumen

La identidad de los profesionales de enfermería como grupo cultural está definida por la entrega de cuidados centrados en las necesidades del paciente, familiares y la comunidad, razón por la cual el aprendizaje en ambientes virtuales con metodología b-learning es vista con resquemor, debido a que la interacción se presenta como una actividad indispensable para el logro de habilidades sociales e interpersonales. Describir los aportes al aprendizaje de los estudiantes con la implementación de la metodología b-learning. Transferir la experiencia y ser un aporte al conocimiento para otros cursos de pregrado. Estudio cuantitativo, descriptivo, transversa. Al término del curso de 16 semanas se aplicó una encuesta especialmente diseñada, compuesta de 19 ítems con respuestas en escala de tipo Likert a un n de 72 estudiantes. A todos los participantes se les solicitó la firma de consentimiento informado. Los datos fueron analizados mediante programa computacional Excel. Participaron 7 hombres y 65 mujeres, de edades entre los 19 y 24 años. En las preguntas referidas a la metodología b-learning y sus aportes al aprendizaje (11 ítems), el 90% de los estudiantes realizó una evaluación positiva (muy de acuerdo o de acuerdo) con las aseveraciones. En las preguntas referidas al contenido del curso y la relación con docentes y compañeros, el 95% de los estudiantes realizó una evaluación positiva (muy de acuerdo o de acuerdo) con las aseveraciones. Los aportes al aprendizaje de los estudiantes con la implementación de la metodología b-learning dicen relación principalmente con la posibilidad de "aprender a aprender". Destacan aspectos como el orden en el estudio y distribución del tiempo, la satisfacción de intereses personales y profesionales, la innovación de actividades y flexibilidad de la metodología, la comunicación adecuada con docentes y compañeros, y la percepción de aprender lo mismo en comparación a un curso tradicional. Perciben además que un curso con esta modalidad no reduce la carga de estudio al compararlo con un curso presencial. En cursos posteriores se debe mejorar la creación de situaciones de aprendizaje desafiantes para el estudiante, único ítem evaluado que fue evaluado de manera negativa.

Palabras clave: B-Learning, Educación universitaria, Estudiantes enfermería.

Abstract

The identity of nursing professionals as a cultural group is defined by the delivery of care focused on the needs of the patient, family and community, which is why learning in virtual environments with b-learning methodology is viewed with resquemor, because interaction is presented as an essential activity for the achievement of social and interpersonal skills. To describe the contributions to student learning through the implementation of the b-learning methodology. To transfer the experience and be a contribution to knowledge for other undergraduate courses. Quantitative, descriptive, transverse study. At the end of the 16-week course, a specially designed survey was applied, composed of 19 items with Likert scale responses to an n of 72 students. All participants were asked to sign an informed consent form. The data were analyzed using Excel software. 7 men and 65 women, aged between 19 and 24, participated. In the questions referring to the b-learning methodology and its contributions to learning (11 items), 90% of the students made a positive evaluation (very agree or agree) with the assertions. In the questions regarding course content and the relationship with teachers and peers, 95% of the students gave a positive evaluation (very much in agreement or in agreement) with the assertions. The contributions to student learning with the implementation of the b-learning methodology are mainly related to the possibility of "learning to learn". Aspects such as the order in the study and distribution of

time, the satisfaction of personal and professional interests, the innovation of activities and flexibility of the methodology, adequate communication with teachers and peers, and the perception of learning the same in comparison to a traditional course stand out. They also perceive that a course with this modality does not reduce the burden of study when compared to a face-to-face course. In subsequent courses, the creation of challenging learning situations for the student must be improved, the only evaluated item that was evaluated in a negative way.

1. Antecedentes

Actualmente en Chile la modalidad virtual ha comenzado a ser incorporada en la educación superior a través de diversas formas, contemplando formatos que van desde un cien por ciento de modalidad virtual a formatos que incorporan sesiones presenciales como parte de la metodología de enseñanza. Las carreras del área de la salud no se han mantenido al margen de esta propuesta, siendo enfermería una de las carreras que ha comenzado a incorporar con entusiasmo la modalidad virtual como parte de sus estrategias de enseñanza tanto a nivel de pregrado, postgrado y formación continua.

La modalidad virtual ofrece variados espacios de crecimientos situando a los estudiantes desde la base de aprendizaje activo, el cual demanda autogestión y construcción de conocimientos, necesarios en cualquier profesional del área de la salud. A nivel internacional se reconoce que para enfrentar estos desafíos, es necesario contar con profesionales de salud altamente competentes, quienes contribuyan a un exitoso rediseño del sistema de salud, metas que se pueden alcanzar con metodologías de enseñanza orientadas a desarrollar habilidades cognitivas, técnicas e interpersonales de alto nivel.

La implementación de metodologías de enseñanza en modalidad virtual es vista con resquemor (1), ya que la interacción entre los estudiantes y personas se presenta como una actividad indispensable para el logro de las habilidades sociales e interpersonales necesarias para el ejercicio de la profesión. Es por eso que se ha privilegiado el uso de B-learning, a través de una combinación entre la modalidad presencial y virtual (2).

Los principales desafíos a los cuales se enfrenta nuestro país en la implementación de metodologías de enseñanza virtual son generar investigación que permita una implementación de la modalidad virtual con pertinencia para nuestra realidad educativa local y reflexionar en profundidad acerca del cambio real de paradigma en torno al proceso educativo (3).

2. Método

Estudio cuantitativo, descriptivo, transversa. Al término del curso de 16 semanas se aplicó una encuesta especialmente diseñada a 72 estudiantes, compuesta de 19 ítems con respuestas en escala de tipo Likert de cuatro alternativas, descritas como Muy De Acuerdo (MDA), De Acuerdo (DA), En Desacuerdo (ED) y Muy En Desacuerdo (MED). A todos los participantes se les solicitó la firma de consentimiento informado y se cautelaron los Principios Éticos de Emanuel (Rodríguez, 2004). Los datos fueron analizados mediante programa computacional Excel.

3. Resultados

Participaron 7 hombres y 65 mujeres, de edades entre los 19 y 24 años. En las preguntas referidas a la metodología b-learning y sus aportes al aprendizaje (11 ítems), el 90% de los es-

tudiantes realizó una evaluación positiva (muy de acuerdo o de acuerdo) con las aseveraciones (Figura 1).

Figura 1

Gráfico de resultados de la metodología b-learning y sus aportes al aprendizaje

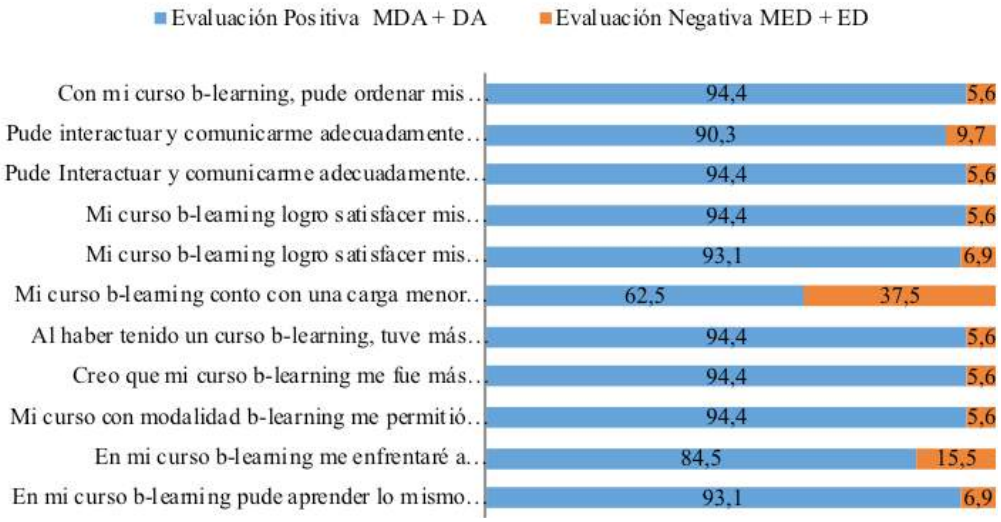
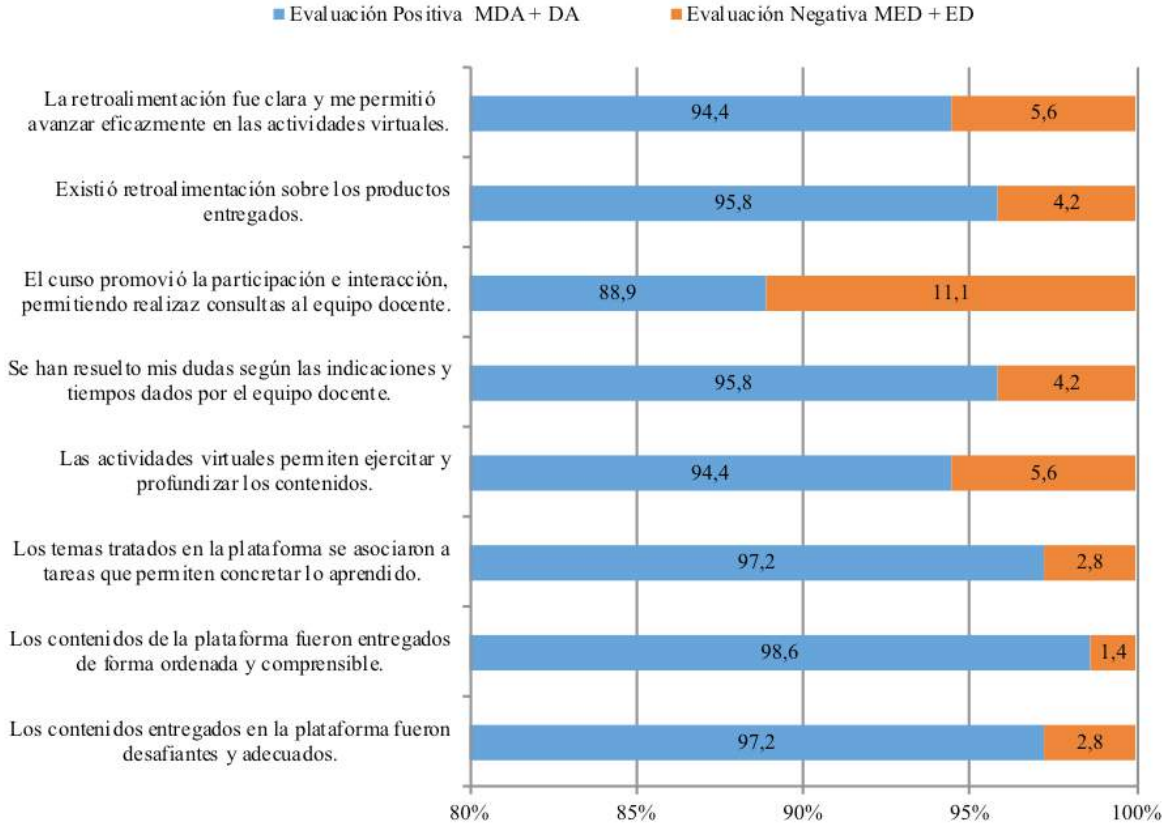


Figure 2

Gráfico de resultados del contenido del curso y la relación con docentes y compañeros



En las preguntas referidas al contenido del curso y la relación con docentes y compañeros, el 95% de los estudiantes realizó una evaluación positiva (muy de acuerdo o de acuerdo) con las aseveraciones (Figura 2).

4. Conclusión

Los aportes al aprendizaje de los estudiantes con la implementación de la metodología b-learning dicen relación principalmente con la posibilidad de "aprender a aprender". Se destacan aspectos como el orden en el estudio y distribución del tiempo, la satisfacción de intereses personales y profesionales, la innovación de actividades y flexibilidad de la metodología, la comunicación adecuada con docentes y compañeros, y la percepción de aprender lo mismo en comparación a un curso tradicional. Perciben además que un curso con esta modalidad no reduce la carga de estudio al compararlo con un curso presencial. En cursos posteriores se debe mejorar la creación de situaciones de aprendizaje desafiantes para el estudiante, único ítem evaluado que fue evaluado de manera negativa.

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Activist scholarship, radical subjects, and political engagements: Novel and necessary

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Abstract

Derived from more than thirty years of political activism that has informed my scholarship, this paper (and poster) describe and problematize the praxis of 'politically motivated' engagements of radical academics. Drawing from literature in the field, the different and sometimes contradictory emphases in the terms 'community-engaged scholarship' (CES) and 'activist scholarship' (AS) lead me to submit that the politically explicit approach of AS more unambiguously allows its practitioners to name and embrace the unsettling power differentials, in-commensurabilities and contradictions of all engaged scholarly work oriented toward social change. My observations on AS are embellished with learnings accrued from several deliberate dialogues with non-academics in social movements in which I have worked in long-term engagements in Saskatoon, Saskatchewan, (Canada) and in Nicaraguan feminist, anti-mining and student movements. The intent of the dialogues was two-fold: 1) to deepen my understanding of community-located activist perspectives on university-located activist scholarship, both locally and globally, and 2) to enter into a reflective space with activist colleagues in a process we called "mirroring" —attempting to see each other through a solidarity lens— in order to clarify the most valued modes of activist/academic and student engagement.

The literature, dialogues and reflections illuminate how a radical subject position calls for constant shape-shifting and re-imagining both inside and outside of academe. They also highlighted contradictions and tensions, which raised unsettling questions: about academic authenticity, about privilege and humility, about the reification of dichotomies and othering in the discourse of CES, about perverse incentives of engaged scholarship currently flourishing in academe, and about the liberal and/or settler-colonialist "strive toward innocence" that implicitly runs through much community engagement.

1. Introduction

I have been involved in international solidarity work by means of supporting, witnessing, allying, accompanying, discussing and debating, writing and fighting with Nicaraguans living in rural communities for 35 years. I entered solidarity politics not as a scholar, but as a revolutionary internationalist in the 1980s, and have accompanied Nicaraguans through revolution and war, through successive electoral victories and frauds, through births and deaths of people and social movements, through student uprisings and political crises, and through waves and seas of contradictions. Throughout my involvement, I have unevenly, sometimes ambivalently but unapologetically, claimed to engage in Canadian and Nicaraguan political struggles and in scholarship as an activist, participating in the evolution of 'situated knowledges' (Haraway, 1988) and movement praxis.

This paper describes some of the problems and promise of 'politically motivated' pedagogical and research engagements of activist academics. First, I suggest the different and sometimes contradictory emphases on 'community-engaged' (CES) and 'activist' scholarship (AS) that lead me to submit that the politically explicit approach of AS more unambiguously allows its practitioners to name and embrace the unsettling power differentials, in-

commensurabilities and contradictions of all engaged scholarly work oriented toward social change. My observations on AS are tempered and interpolated with learnings accrued through deliberate dialogues with non-academics in social movements in Saskatoon, Saskatchewan (Canada), and in Nicaragua that are reported in the second section of the paper. The literature, dialogues, and reflections illuminate how a radical subject position in academe calls for constant shape-shifting and re-imagining, and highlights contradictions and tensions, raising unsettling questions.

2. Defining Activist Scholarship: Not (Just) Critical

Charles Hale (2006) has discussed at length the meaning of activist scholarship (AS) within anthropology suggesting it as a method of politically aligning with an organized group of people, where dialogue with the group informs the process of action." Hale recognizes that such alignments are fraught with contradictions but suggests that the examination of those contradictions produces theoretical insights unavailable through other forms of critical scholarship (Hale, 2008). In a similar vein, Speed defines activist scholarship as the "overt commitment to an engagement with our research subjects that is directed toward a shared political goal" (p. 71) a position that she distinguishes from critically engaged research, understood as critical analysis without necessarily engaging politically alongside subjects (Speed, 2006). Writing from a feminist perspective, Sudbury and Okazawa-Rey define activist scholarship as knowledge and practices that result from actively engaging with, and serving, social movements (Sudbury & Rey, 2012). For Cox (2015), truly reflexive 'critical scholarship' recognizes that awareness of injustice does not in itself change things. Rather, invoking Gramsci and Marx, "the only intellectually serious and politically credible position from which it makes sense for radicals to engage with academia is within a practice and relationships [that] support those social forces that actually embody a challenge to injustice and oppression" (p 39).

Unpacking these and other definitions of AS highlights contradistinctions with other forms of critical scholarship: 1) the place of *dialogue* and negotiation as *ongoing, evolving and inside* the 'engagement' process; 2) the *mode of production*, validation and uses *of critical embodied knowledges*; 3) the idea of *explicit political alignment* with social movements or groups in struggle; and 4) the inevitability and recognition of *contradiction*, *messiness* and *tension* in the social relationships that define the encounter of the university-located activist with the community-located movement – that reflect the reality of actual political praxis.

The embodied nature of those living contradictions frequently leads activist scholars to find themselves located within deeply 'fractured' subject positions and identities that find little validation through standard academic processes, but that are necessary to name, negotiate, critique and re-imagine. Over several years, in search of a novel AS process that would employ the above principles and allow for a community activist assessment and validation of radical academic work, I experimented with dialogue in my own practice.

3. The Dialogues

Between 2015-2019, I led various deliberate dialogues with non-academics in the social movements I was involved with, in long-term engagements in Saskatoon, Saskatchewan, (Canada) and rural Nicaragua. The formal intent of the dialogues was to deepen understandings of community-located activist perspectives on university-located

activist scholarship, both locally and globally; and to enter into a reflective space with activist colleagues in a process we called "mirroring," which attempts to see each other through a solidarity lens to clarify the most valued modes of activist/academic and student engagements and (re)imagine alternatives. Following is a brief description of two of the dialogues and some questions they raised.

A first set of dialogues concerning the nature and meaning of international solidarity involved three Nicaraguan movement structures/organizations: the national anti-mining movement MONAFMI, the student movements CUDJ, and the feminist organization Fundacion Entre Mujeres (FEM): an organization I have a long and complex relationship with. Located in northern Nicaragua, FEM is a feminist eco-agricultural NGO, a site of resistance, and a feminist activist hub. My ongoing personal, political and academic long-term relationship with FEM (as an international ally and friend) involves being employed by them, and organizing, researching and planning with them – all of which facilitated fifteen years of student participation in action research, community mobilization, international solidarity and experiential education that has proved enraging and exhilarating, full of mistakes and regrets, and fulfillments and pleasures. Politically, that pedagogical work evolved in a constantly shifting global and Nicaraguan context. That shifting context and our ongoing relationships provided my students with a deeper understanding and knowledge of solidarity and social movements than any university training could have. Yet I had doubts as to reciprocal benefits.

FEM leaders agreed to dialogue with me as it fit with the organization's need to create its own set of guidelines for academic engagement: FEM was increasingly serving as a desired 'site' for research and education and was inundated with requests for student engagement. They also saw dialogue as potentially useful in their ongoing practice of theorizing the decolonizing feminist practice that the organization embodies. And so, our conversation focused on our common search for a set of principles and theoretical concepts that would define non-colonial solidarity 'engagements' between community- and university-located activists and academics. The conversation revealed the troubling colonial constructs of development that permeate most global academic-community encounters and highlighted the lack of authenticity and commitment in the momentary world of student experiential education. It thus proved less than useful in informing a set of principles to guide those practices. Although my long-term solidarity work with them continues, the disturbing sense of in-commensurability with social movement praxis led me to discontinue student engagements.

In 2016, I engaged in dialogue with two activist friends from social justice movements in Saskatoon; the facilitator of 'Next Up', a radical youth leadership program that uses transformative pedagogy to provoke a life-way of activism, and the owner of an alternative bookstore and meeting space for local social justice organizations. That dialogue focused on practices that seemed promising to hold to account academic privilege and freedom while harnessing their potential for activism in the city. The conversations evaluated and appreciated how, why, and when activist/academic engagements we'd been part of had facilitated or hampered movement practice, and clarity was sought on expectations and good practice, with an exploration of promising pedagogical practice for 'teaching' radical politics – theirs and mine. Concepts like trust, criticism, silencing, translation, obligation, solidarity, privilege, and decolonization dotted the conversation. Engagement though, was seldom mentioned, and volunteering, as student engagement, was considered apolitical and sometimes antithetical to social movement praxis. Beyond other myriad observations the dialogues were experienced as valuable largely because they surfaced contradictions and left questions.

4. Contradictions, Tensions, and Questions Raised

Varied forms of critical scholarship point out how the production of academic knowledge can function to support capitalist hegemony through the "alienations and separations" it supports and enacts in part through the binaried oppositions it creates (Motta & Esteves, 2014). Instructive of this problematic is the university/community binary implied by the term "community engagement". To radically move beyond community-engaged scholarship and embrace AS implies *ongoing, evolving and insider dialogue and negotiation,* a critical embodied *mode of knowledge production, explicit political alignment* and embracing of the *contradiction*s inherent in the encounter of the university-located activist with the community-located movement.

The radical subject position implied in such a move demands constant shape-shifting and re-imagining both inside and outside of academe. In my case, to keep myself in check in a permanent search for authentic useful political engagement and to live in an ethic of solidarity, deliberate dialogues with community-located activists proved valuable precisely because they highlighted contradictions and raised unsettling questions: about authenticity and commitment in (especially) global experiential education, about privilege and the constant learning of humility, about the reification of dichotomies and othering in the language and practice of CES, about the perverse incentives of engaged scholarship currently flourishing in academe, and about the liberal and/or settler-colonialist "strive toward innocence" that implicitly runs through engaged scholarly work (Razack, Smith, & Thobani, 2010; Tuck & Young, 2012; Walia, 2013). I end on those unsettling reminders.

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Group work in the classroom – ways to make it work

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Abstract

Group work offers students opportunities to share and accept diverse perspectives. It often fails when it is not designed, supervised, and assessed in a way that promotes meaningful learning and deep collaboration. Research has shown that the effectiveness of collaborative learning depends on the quality of student interaction but university teachers often do not feel competent in implementing group work in their classrooms. We were interested in finding out what kind of activities university teachers use to engage students in group work.

The data were based on video-recorded seminars where group work was used as a teaching-learning method. Videos were transcribed: activities of teachers and students, communication, questions asked by teachers and students, students' answers. Transcriptions were analyzed by four researchers.

University teachers should not assume that students have enough skills for learning in groups and they have to give instructions even for elementary aspects or the ones taken for granted. Students also need clear instructions how to present their group work or how to take personal notes during group discussions. The learning environment is of great importance for successful learning in groups.

1. Introduction

Group work can help students to develop skills that are important for their future work life: e.g cooperation skills, communication skills, listening skills. Group work offers students opportunities to share and accept diverse perspectives. George Kuh and colleagues also conclude that cooperative group learning promotes student engagement and academic performance (Kuh *et al.,* 2007). While potential learning benefits of group work are significant, simply assigning group work does not guarantee that these goals will be achieved. Group work often fail when they are not designed, supported and assessed in a way that promotes meaningful learning and deep collaboration. Research has shown that the effectiveness of collaborative learning depends largely on the quality of student interaction and that beneficial student interaction can be fostered by teachers (Kaendler, Wiedmann, Rummel, & Spada, 2015). Research findings have also indicated that university teachers often do not feel competent in implementing collaborative learning in their classrooms (Gillies, Boyle, 2008). Therefore, it is important to understand what a teacher can do to guide student interaction and learning.

The goal of our study was to find what kind of activities help teachers to enhance effectiveness of group work. Base on the above expectations we formulated the following research question:

— What kind of activities do university teachers use to engage students in group work?

2. Data Collection and Analysis

To understand how a teacher can foster student in-class group work we conducted research based on video-recorded seminars where group work was used as a teaching-

learning method. The study is based on 2 video-recorded seminars of 5 university teachers from humanities, social sciences and natural sciences. Videos were transcribed: activities of teachers and students, communication, questions asked by teachers and students, students' answers. Transcriptions were analyzed by four researchers.

3. Findings

Based on the seminar videos it was possible to point out that meaningful tasks, clear structure of group work and guidelines for presenting (the results of) group work supported the initiation of group work. It was easier to start group work when students knew right from the start how they were supposed to present the result of their work (e.g. summaries compiled on their tablets). Students congregated swiftly around their tablets (doing so also in an inconveniently furnished room) and got involved in the task. Electronic gadgets supported working in groups also in case of face-to-face meetings in one lecture hall. The videos showed that in case of a well-selected way of presentation it was easy for the lecturer to follow the progress each group was making, to spot problems and to interfere when students needed support and assistance in more complicated tasks.

In case of longer group work assignments (lasting for a whole seminar or several seminars) the videos gave evidence how intermediate stages of work and intermediate reports supported students' learning. Presentations of group work taking place during the process enabled the lecturer to give feedback and thus provide additional guidelines or additional tasks. In case of a longer task dividing the task into parts promoted learning. An authentic task for learning made it possible to reach results while collaborating. To regulate student interaction, the lecturer in videotaped seminars monitored the process and gave students content related support when needed. Students maintained proactive attitude towards the task when the lecturer moved from one group to the next, followed the discussions and made herself available in case of questions.

Analysis of the video recordings of the seminars also pointed out the circumstances that inhibit initiating group work and learning from it. The lecturer may not explain to students the purpose of group work and expected learning outcomes, it also revealed from videos that lecturer may not justify why she had decided to choose group work. In such instances it was obvious that it took time for the students to start group work and one could notice that some students were not involved in group work (they completed the task individually). Based on the videos it can be pointed out that students took longer to initiate group work when instructions were unclear, and the students were not clearly told how much time they had for group work and how to present the results of their work. In such cases groups worked at a very different pace and it took them longer to start presenting the results of their work. Also, it was seen to happen that groups finished their discussions and compiled their presentations while other groups were presenting their work, so they did not make the most of learning from other groups.

An inconvenient room made it more difficult for group work to be successful, it made it more difficult for students to move around and form groups or discuss things. It also took longer to start group work when it was not clear how to form groups, thus, students wasted time forming groups and could not make up their minds which group to join. In such ambiguous situations some students were left aside from group work. It was obvious from the video recordings that students did not know each other, so initiating group work also took them a lot of time.

Based on the videos it can be pointed out that a lecturer's unexpected and incomprehensible interference interrupts the process of group work and does not promote learning. To be more precise, a lecturer may interfere at a wrong time (too early) with a comment that has little bearing on group work. In the observed seminar the process of group work was not reflected upon, presentations and discussions were focused on the content. Thus, the development (or decline) of group working skills did not become visible for students.

University teachers should not assume that students have enough skills for learning in groups and they have to give instructions even for elementary aspects or the ones taken for granted (seating in groups, turning around when talking). Students also need clear instructions how to present their group work or how to take personal notes during group discussions. The learning environment is of great importance for successful learning in groups. When planning, it is important to contemplate how much time is needed for presentations and completion of group work.

As academic developers we realise/understand that university teachers need additional skills in order to manage group work successfully. Therefore during our pedagogical trainings we should pay more attention to raising university teachers' competences when structuring group work, so that learning in a group would also become more evident for students.

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Improvement of a questionnaire to evaluate the achievement of the «Sustainable development and social responsibility» cross curricular skill

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Abstract

Within an educational innovation project, a strategy to promote the acquirement of the cross curricular skill "Sustainable development and social responsibility" was developed in the degree of Dietetics and Human Nutrition of the University of the Basque Country. A preliminary questionnaire was proposed to assess the integration of the aforementioned competence. As first step of its validation, descriptive analyses of the questionnaire were presented. After identification of specific weaknesses, the questionnaire was appropriately modified. The objective of the present work was to compare the metric properties of the new questionnaire (NQ) and those of the previous version (PQ).

Once the approval was received from the ethic's committee of the University, the validation process was carried out with 100 and 67 students, for PQ and NQ, respectively. Through the statistical program SPSS, description of each item that make up the construct, its structural validity, as well as the reliability of scores and temporal stability were analyzed.

In the case of NQ, 92.5% of the students completed all the items, 6% left only one blank, and one case was invalidated because it did not answer any question. In both questionnaires, the indicators used supported the adequacy of the correlation matrix for the application of factor analysis: Kaiser-Meyer-Olkin index were 0.62 and 0.76 for PQ and NQ, respectively, while the Bartlett's sphericity test obtained significant values in PQ and NQ. The rotated factor matrix of the questionnaire revealed that two factors explained more than 60% of the variability observed in both questionnaires. The first factor consisted on items related to the interest and usefulness of the developed activity, and the second one, to organizational or methodological aspects. The degree of intercorrelation between each factor's elements reached good mark in NQ (Cronbach's alpha = 0.79). Retention test results (10 days time lapse) raised from low (PQ) to medium intensity (NQ).

Even though PQ presented the minimum guarantees required by the international standards, the modifications applied in the NQ enhanced metric properties for validity, reliability and stability allowing proper achievement of "Sustainable development and social responsibility" skill.

1. Introduction

Sustainable development (SD) is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. It includes not only environmental aspects, but also social equality, ethical and economic views [1]. Education has been defined as one of the 17 Sustainable Development Goals of the

2030 Agenda of UN countries (sustainabledevelopment.un.org). In this context, the university is responsible for educating future professionals on SD skills, such system-thinking capacity, ability to anticipate future consequences and strategic competence, always from a holistic perspective [2]. Even thought, big efforts have been made at many Universities to promote SD, defining this competence itself, incorporating it into the curricula, training teachers about it, designing specific active teaching methodologies for its development by students [3, 4], it seems that the results are not as good as expected [5]. Hence, our research group was encouraged to join this challenge in the field of Human Nutrition.

Within an educational innovation project, our working group designed a strategy to promote the gradual acquirement of sustainability and social responsibility cross-curricular skill (as an important part of SD for health professionals) in the Degree on Human Nutrition and Dietetics (HND) of the University of the Basque Country. The need to evaluate our intervention carried us to search tools to measure the acquisition and internalisation of the aforementioned competence. For this reason, the aim of the present work was to design and validate an appropriate questionnaire to achieve this purpose.

2. Methods

First, we carried out a pilot study where the competence was defined, and active-collaborative activities were designed to develop it in subjects from all the courses of HND Degree. They were implemented in the class. Altogether, 101 students and 10 teachers took part in this process, grouped in 8 subjects. Based on this experience, our team proposed a preliminary questionnaire to specifically assess the integration of sustainability and social responsibility skill.

Afterward, we started its validation. For that purpose, the questionnaire was answered by students without any relation with our project, not involved in the previous pilot study. 100 students filled it, they belonged to HND Degree and other Grades related to it and taught in the same Faculty, such as Pharmacy and Food Science and Technology.

Descriptive analyses of the questionnaire were performed. Once specific weaknesses were identified, the questionnaire was appropriately modified, and it was again completed by students (n = 67). Metric properties of the new questionnaire (NQ) and those of the previous version (PQ) were compared through the statistical program SPSS. Description of each item that make up the construct, its structural validity, as well as the reliability of scores and temporal stability were analysed.

3. Results and Discussion

With regard to the structure of the questionnaire, it must be pointed out that it gathers different issues. First, students are asked about their **knowledge** related to our target competence, and what they believe regarding its involvement in health and nutrition related aspects, such as food origin, food processing, dietary habits and related pathologies, etc. Latter, students answer to 14 question to measure their sustainable **behaviour**. In addition, to consider **specific sub-competences** include in SD (holistic view, anticipatory skill and strategic competence), specific queries about them and their development through the activities carried out in class are included, as well as their opinion about them.

In relation to metric properties of the questionnaire, in the case of NQ, 92.5% of the students completed all the items, 6% left only one blank, and one case was invalidated because it did not answer any question. Kaiser-Meyer-Olkin index as weel as Bartlett's sphericity test values, 0.62 and 34.1 ($p < 0.01$) respectively, allowed the use of correlation matrix for the application of factor analysis in the case of PQ. Similarly, both test values confirmed the adequacy of the correlation matrix in NQ, 0.76 and 201.7 ($p < 0.01$).

According to the rotated factor matrix of the questionnaires, two factors explained 63.1% and 60.8% of the variability observed in PQ and NQ respectively. The first factor consisted on items related to the interest and usefulness of the developed activity, and the second one, to organizational or methodological aspects. The modifications implemented in term of items reformulation, insertion (use of control items) or deletion, seemed to be effective. The degree of intercorrelation between each factor's elements was improved from PQ (Cronbach's alpha = 0.65) to NQ (0.79). Retention test results (10 days time lapse) raised from low (PQ) to medium intensity (NQ).

The results obtained in the metric properties, confirmed that both questionnaires present the minimum validity and reliability guarantees required by International Standards for test creation and adjustment [14]. Nevertheless, the modifications applied in the NQ enhanced metric properties for validity, reliability and stability.

Once NQ has been validated as proper tool evaluate the understanding of student about sustainability and social responsibility, our next step will be to conduct a cross-sectional study. As it was reported by others [14], it would be of interest to describe the sociodemographical profile of the student group involved in the study. This limitation can be solved with the aid of an adequate and validated test, commonly used in this type of studies.

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How to support collaboration among students participating in an online course?

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Abstract

The collaboration skill is considered as one of the 21st-century learning skills (Framework for 21st Century Learning, 2007), and it is, also, an essential study skill (e.g. Cottrell, 2013). In recent years, the number of online courses has been increased, and these courses challenge collaboration between participants who are not familiar with each other but work together towards the same learning goals. This action research is about redesigning the online study skills course to improve collaboration among high school students participating in the course. Therefore, the aim was to find out student opinions about what developed in their collaboration as a study skill within the assignment and their suggestions on how to enhance the collaboration within the assignment.

This action research involves 43 high school students participating in an online course on study skills in 2018. The data was gathered via feedback questionnaire and was analyzed using qualitative content analysis. The results show that within the scope of the assignment, the participants had the opportunity to develop their leadership, communication, and compromising skills. To improve the collaboration, the participants suggested that the moderator should make random groups and the personal data for contacting each other should be provided.

1. Introduction

The collaboration skill is considered as one of the 21st-century learning skills (Framework for 21st Century Learning, 2007), and it is, also, an essential study skill (e.g. Cottrell, 2013; Moore, Neville, Murphy, & Connolly, 2010). Research has shown that collaborative learning leads to higher achievement, less stress and greater student satisfaction (Swan *et al.*, 2006). Moreover, the online environment, as compared to classroom, allows students to gain more deeper experience in teamwork and communication (Hoag & Baldwin, 2000). However, uncareful structuring of the collaboration assignment can lead participants to disappear online (Swan *et al.*, 2006).

In recent years, the number of online courses has increased along with the development of technology. These courses challenge collaboration between numerous participants who are not familiar with each other but work together to achieve the same learning goals. This study is about enhancing collaboration between the online course participants.

1.1. The online course on study skills

This action research is about redesigning the online study skills course to improve collaboration among high school students participating in the course. The duration of this online course is six weeks (2 ECPs), it is held once a year, and the topics of the course are related to various study skills which are practiced through various assignments (e.g. a schedule for a certain period of time, an essay on study skills).

The idea behind the redesign stems from the students' feedback on their studies (in 2017), that indicated that the online course could focus more on advancing their collaboration skill. The redesign process included the addition of the "Our learning experience" group assignment to the compulsory programme (in 2018), and as part of this assignment, the students contemplated their online learning experience and created a poster as a team (using padlet.com, a concept mapping tool) using assessment rubrics (summarizing theoretical perspectives and describing their team, as well as personal learning experience).

Therefore, to study the effectiveness of the assignment, the aim was to find out student opinions about what developed in their collaboration as a study skill within the assignment and their suggestions on how to enhance the collaboration within the assignment. To achieve the aim, following research questions were stated:

1. What did develop in students' opinion in their collaboration as a study skill within the assignment?
2. What do students suggest to improve collaboration within the assignment?

2. Methodology

The method employed for finding the answers to the research questions was action research. This study involves 43 high school students (grades 11 and 12), who participated in the online study skills course in the fall of 2018. These students answered the feedback questionnaire that was used as a means of collecting data. In the questionnaire, the students could express their opinions and reflect on their learning experiences through open-ended and multiple-choice questions. Overall, 127 students were enrolled in the course, and 80 of them (63%) completed the course with a positive result.

The data was analysed using qualitative content analysis. To increase credibility, the author of the article and her colleague conducted a co-coding on the range of the data. After coding, differences were discussed, and a consent decision was reached. All students in the course were informed about the aim of the study, and they participated in this study voluntarily.

3. Results

3.1. The development in student' collaboration skill

The answers to the research question "What did develop in students' opinion in their collaboration as a study skill within the assignment?" indicate that student had an opportunity to develop their leadership and communication skills, e.g. meeting members' needs, compromising, considering the opinions of others.

> I was a leader of my group and I led the team to successfully complete the assignment. I had the biggest responsibility; I had to assign tasks to my team members while considering their interests and wishes. (Ken)

The student indicated that as part of the assignment they were put in a situation where they had to collaborate with complete strangers from all over the Estonia. In this case, the

student felt it was surprisingly easy to communicate with other members of the team while staying true to themselves and expressing their opinions.

> Having to work together with complete strangers gave me the increased courage to express my opinion. Teamwork helped us create a common schedule and divide tasks. (Helen)

> I dared to take the initiative and suggest the platform for the assignment. (Anni)

In conclusion, the skills that the students developed as a result of the assignment are consistent with what has been stated in earlier studies. For example, Hoag and Baldwin (2000) have also found that through online collaboration, participants gained tremendous experience in teamwork, time management, communication, and use of technology.

3.2. The student suggestions to enhance the collaboration

The answer to the research question "What do students suggest to improve collaboration within the assignment?" indicate that, according to the students, the moderator should create random groups to facilitate collaboration between the students, instead of letting the students choose their team members.

> The moderator should assign teams to exclude the possibility of working together with a friend. (Tom)

> Teams should consist of random members so that everyone is in a new group and steps outside their comfort zone. This time, some of the teams consisted of friends. (Anu)

The students proposed many technical improvements for the assignment. For example, they mentioned that the technical tool for creating the groups should exclude the possibility of removing other members from the group. This happened with a Google document where they would add their names under the number assigned to each team (they could add four names under each team), but in some cases, some names were erased by other participants.

It was also pointed out that students' contact details should be provided to improve communication (this option was not available in the fall of 2018), because participants felt that using the Moodle platform was too difficult to communicate with each other.

> There should be an option to add an email address to improve communication. (Anu)

Some students suggested making it possible to do the assignment by themselves, which, in turn, calls into question the collaborative goal of the assignment, since it is not being achieved.

It can be concluded that the students provided several suggestions on how to enhance collaboration within the scope of the assignment. In some cases, participants did not take part in group assignments for reasons unknown (see, e.g. Taylor, 2011). This raises the question of how to prevent such situations from happening in the future, in order to achieve the collaborative purpose of the assignment.

4. Conclusion and future research

Within group-work assignment, student could practice skills related to leadership and communication. After participating in the groupwork, they suggested many technical improvements to enhance the learning experience.

Based on student experience, the author of this article, will add, for example, a group assignment guide with helpful tips for effective collaboration with team members. Random team creation and an option to exchange contact details with other members of the group will be added to the course, and these activities need a moderator's monitoring. After the improvement, students will be asked to provide feedback about their learning experience.

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El aula virtual como elemento favorecedor de la implicación del estudiante: una experiencia en una asignatura optativa del Grado en Matemáticas de la UPV/EHU

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Resumen

Los estudios de grado adaptados al Espacio Europeo de la Educación Superior han supuesto un cambio significativo en el planteamiento del proceso de enseñanza-aprendizaje: el estudiante tiene que adoptar un rol activo dentro de su propio aprendizaje. Esto ha implicado que el profesorado tenga la necesidad de explorar el uso de nuevos recursos docentes, que faciliten el cambio del rol del estudiante. Entre estos recursos, y gracias a que las universidades han invertido en sistemas de *e-learning*, uno de los más utilizados es un aula virtual de apoyo a la docencia presencial.

Este artículo investiga la influencia del diseño del aula virtual de apoyo a la docencia presencial en la implicación del estudiante y su impacto en los resultados de aprendizaje. Por ello, se analiza la estructura del aula virtual de apoyo a la docencia presencial en una asignatura optativa de 4.º curso del Grado en Matemáticas de la Universidad del País Vasco durante tres años académicos (de 2016/17 a 2018/19), para hallar los elementos favorecedores de la implicación y aprendizaje del estudiante.

Abstract

The degree studies according to European Space for Higher Education have meant a significant change in teaching and learning processes: the student has to take an active role in his own learning. This has implied that faculty has to explore the use of new teaching tools that facilitate the change of roles. Among these tools, and thanks to universities have invested considerable resources in e-learning systems, one of the most used tools is the virtual classroom, as a supplement to face-to-face instruction.

This paper investigates the influence of the design of the virtual classroom in the engagement of students and its impact in their learning outcomes. So, we analyse the structure of the virtual classroom as a supplement to face-to-face instruction in an optional course of 4th year of Mathematics Degree at University of the Basque Country during three academic years (from 2016/17 to 2018/19), in order to find the elements that benefit the engagement and learning of students.

1. Introducción

La adaptación de la educación superior al Espacio Europeo de la Educación Superior (EESS) conlleva una transformación de los papeles que, tradicionalmente, profesorado y alumnado desempeñaban en el proceso de enseñanza-aprendizaje: el docente se convierte en un elemento dinamizador del proceso y el dicente debe erigirse en el protagonista de su propio aprendizaje. Este cambio ha traído consigo la búsqueda de recursos docentes que faciliten la implicación del alumnado y la adquisición de las competencias específicas y transversales asociadas a las asignaturas. Así, en la educación superior se han incorporado metodologías activas en el desarrollo de las asignaturas (p.e. aprendizaje basado en proyectos) y se han buscado nuevos entornos que favorezcan el aprendizaje, como pueden ser las aulas virtuales de apoyo a la docencia presencial.

Es conocido que cada vez más docentes de educación superior apuestan por la inclusión de las aulas virtuales en los cursos que imparten. Esta herramienta permite al profesorado combinar las ventajas del aprendizaje online, con los beneficios de la docencia presencial (Najmul Islam, 2013), siendo esta combinación uno de los motivos que explican su amplio uso. Además, ofrece al alumnado una experiencia de aprendizaje más motivadora intelectualmente (Woods *et al.*, 2004). Así, las aulas virtuales favorecen la comunicación docente-estudiante, la implicación del estudiante y el seguimiento en la adquisición de las competencias asociadas a la asignatura. Por ejemplo, a través de un aula virtual, se le puede pedir que envíe las tareas programadas en la asignatura y ofrecerle su retroalimentación. De esta forma, se consigue que se implique en la asignatura mediante la realización de las tareas, se establece un diálogo entre docente-dicente, al darle su retroalimentación y se tiene una evidencia del nivel de adquisición de las competencias asociadas a las tareas.

Buscando mejorar los resultados y la implicación del alumnado en la asignatura optativa *Códigos y Criptografía* del 4º curso del Grado en Matemáticas de la UPV/EHU (GMAT), el equipo docente rediseñó los contenidos de su aula virtual de apoyo a la docencia presencial. Precisamente, el objetivo de esta comunicación es compartir su experiencia y mostrar las conclusiones que han extraído de la misma.

2. Descripción de la experiencia

2.1. Motivación

Según el calendario de implantación del Plan de Estudios de GMAT, en el curso 2013/14 se comenzó a impartir la asignatura *Códigos y Criptografía*, optativa de 6 ECTS. Sus 60 horas lectivas se dividían en: magistrales (30), prácticas de aula (9), prácticas de ordenador (15) y seminarios (6).

Para poder trabajar las competencias específicas y transversales asociadas a la asignatura, el equipo docente definió diferentes tareas a realizar por el alumnado en las horas lectivas de prácticas y de seminario. Por la experiencia que tenían impartiendo otras materias, el profesorado de la asignatura consideró que sería útil disponer de un aula virtual de apoyo a la docencia presencial, como repositorio del material teórico-práctico que debía usar el alumnado. Esta aula virtual está integrada en la plataforma eGela de la UPV/EHU, que utiliza parte de las funcionalidades de Moodle, herramienta de gestión de aprendizaje en código abierto creada por Martin Dougiamas (Cole y Foster, 2007).

El aumento del número de estudiantes que cursaban la asignatura (18 en 2013/14, 46 en 2014/15, 54 en 2015/16) hizo que el equipo docente rediseñara el aula virtual para utilizarla como herramienta del seguimiento de la adquisición de competencias ligadas a las prácticas de ordenador a partir del curso 2015/16. Esta experiencia resultó positiva para profesorado y alumnado (García y Valle, 2016).

Con las mismas actividades programadas en la asignatura y el mismo esquema de aula virtual que en 2015/16, los resultados globales de la asignatura en la convocatoria ordinaria de 2016/17 descendieron de forma considerable (ver Gráfico 1). Parte de ese descenso podía justificarse por el perfil más heterogéneo del alumnado matriculado ese año académico. Pero el equipo docente observó que en la adquisición de las competencias ligadas a las prácticas de ordenador no se había producido esa diferencia. Por ello, se planteó explorar la utilización del aula virtual como un elemento dinamizador del proceso de enseñanza-aprendizaje

en todas las modalidades docentes de la asignatura, con la inclusión de nuevos recursos. Así, en 2017/18 incorporó nuevos materiales teóricos y en 2018/19 añadió dos actividades colaborativas: creación de una base de datos y realización de un wiki sobre los problemas trabajados de forma grupal en los seminarios.

Gráfico 1

Porcentaje de aprobados y de suspensos o no presentados y nota media de los estudiantes presentados en la convocatoria ordinaria de la asignatura por año académico

2.2. Metodología

En el estudio del uso del aula virtual de la asignatura "Códigos y Criptografía," cuyas conclusiones se relatan en esta comunicación, se han considerado los informes de los registros de la actividad realizada en ella por el alumnado matriculado durante los cursos 2016/17, 2017/18 y 2018/19. Así, se ha analizado el uso realizado por 127 estudiantes (54 en 2016/17, 26 en 2017/18 y 47 en 2018/19), considerando tanto la actividad por tipo de recurso incluido en el aula, como la realizada por cada estudiante. Además, se han cruzado los registros de actividad de cada estudiante, con la calificación obtenida en la convocatoria ordinaria de la asignatura. Hay que señalar que para el curso 2018/19 solo se ha considerado la actividad realizada por el alumnado hasta final del primer cuatrimestre, periodo en el que se imparte la asignatura.

3. Resultados de la experiencia

En el Gráfico 2, se muestra la media del número de accesos del estudiante, según la categoría de recursos a los que accede por curso académico. Las categorías consideradas han sido:

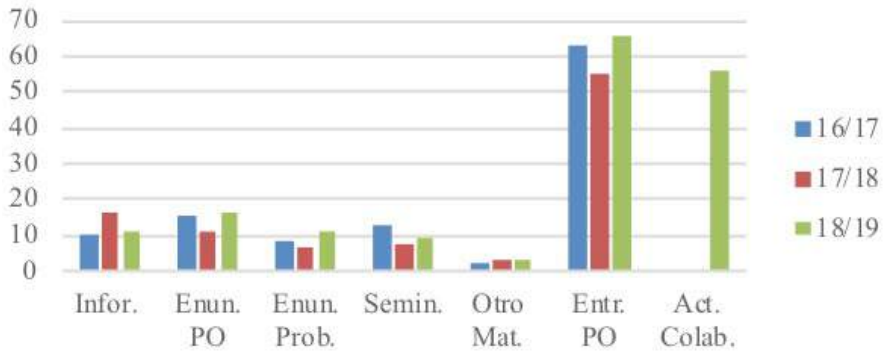
1. Información (Infor.): Se engloba a Foro de noticias, guía del estudiante, horas de tutoría del profesorado, convocatorias de examen, distribución de grupos, modelos de exámenes de años anteriores y, en general, cualquier información relacionada con el curso.
2. Enunciados de prácticas de ordenador (Enun. PO): Son los ejercicios de programación propuestos en las prácticas de ordenador.
3. Enunciados de Problemas (Enun. Prob.): Enunciados de los ejercicios y problemas propuestos en la asignatura.

4. Seminarios (Sem.): Material teórico-práctico utilizado en los seminarios.
5. Otro material (Otro mat.): Enlaces a artículos y libros, apuntes, ejemplos y otros relacionados con los contenidos del curso.
6. Entrega de prácticas de ordenador (Entr. PO): Entrega y retroalimentación de las tareas de las prácticas de ordenador.
7. Actividades colaborativas (Act. Colab., solo en 2018/19): Creación de una base de datos y participación en un wiki.

Se observa que la inclusión de actividades colaborativas en 2018/19 ha permitido aumentar la actividad en el resto de categorías respecto a 2017/18, excepto en la de "Información". Además, alcanza el máximo de participación en cuatro de ellas (Enun.PO, Enun.Prob., OtroMat. y Entr.PO). Asimismo, en 2017/18 la inclusión de nuevos materiales, englobados en la categoría "Otro material", supuso el aumento del número medio de accesos en esta categoría respecto a 2016/17, aun tratándose de un grupo de estudiantes que se conectaban menos al resto de recursos que el grupo del año anterior, salvo en "Información". Así, en 2016/17 un estudiante accedió al aula virtual por término medio 322 veces, en 2017/18 lo hizo 219 veces, mientras que en 2018/19 fueron 385.

Gráfico 2

Número medio de accesos por estudiante y año académico, según categoría del recurso



Además, si se considera la variable de superar o no la asignatura en la convocatoria ordinaria, se aprecia mayor actividad media entre las personas que la superan (352 frente a 297 en 2016/17, 225 frente a 207 en 2017/18 y 396 frente a 368 en 2018/19). Más aún, de los Gráficos 3-6 se deduce que el porcentaje de estudiantes que no superó la asignatura en la convocatoria ordinaria en 2017/18 y se conectó menos de 200 veces fue del 66,67%, frente al 52,94% entre los aprobados. Por otro lado, en 2018/19 el 76,47% de los que no superaron la asignatura en convocatoria ordinaria, se conectaron menos de 400 veces, mientras que entre los que aprobaron fue un 56,67%. En definitiva, se observa que los estudiantes que no superan la asignatura en la convocatoria ordinaria tienden a tener menor actividad en el aula virtual.

Por último, la incorporación de nuevos elementos en el aula virtual ha contribuido a la mejora en el porcentaje de aprobados en la convocatoria ordinaria de la asignatura para los tres cursos académicos estudiados (68,08% en 2018/19, 65,38% en 2017/18 y 42,59% en 2016/17).

Gráfico 3

Porcentaje de estudiantes que no superaron la asignatura en la convocatoria ordinaria de 2017/18 y ha accedido x veces al aula virtual

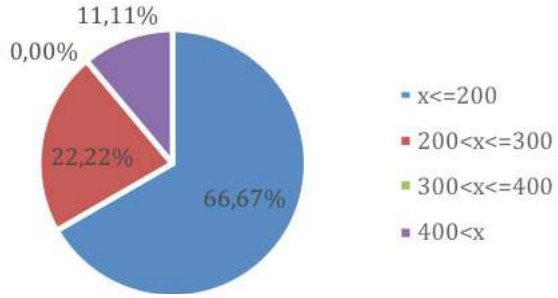


Gráfico 4

Porcentaje de estudiantes que superaron la asignatura en la convocatoria ordinaria de 2017/18 y ha accedido x veces al aula virtual

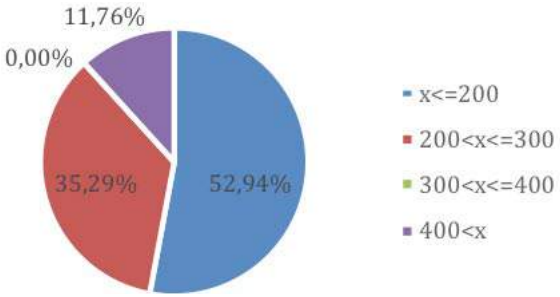


Gráfico 5

Porcentaje de estudiantes que no superaron la asignatura en la convocatoria ordinaria de 2018/19 y ha accedido x veces al aula virtual

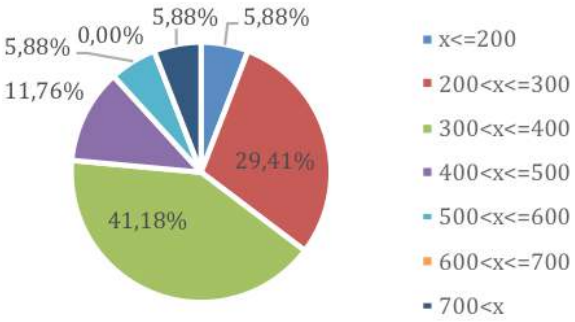


Gráfico 6

Porcentaje de estudiantes que superaron la asignatura en la convocatoria ordinaria de 2018/2019 y ha accedido x veces al aula virtual

4. Conclusiones

Las principales conclusiones que se extraen de la experiencia son:

— La inclusión de elementos de aprendizaje colaborativo, como wikis o creación de bases de datos, incrementa el uso del aula virtual de apoyo a la docencia presencial. Esto se refleja en que el 100% del alumnado ha realizado y consultado este tipo de recursos, implicándose en su propio aprendizaje. Además, permite mejorar el porcentaje de estudiantes que supera la asignatura en la convocatoria ordinaria.
— Se aprecia una correlación entre el mayor uso del aula virtual y la superación de la asignatura en la convocatoria ordinaria.

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Supporting Doctoral Candidates as Early Career Teachers: Addressing Teaching Challenges Through Design

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Abstract

In this paper we discuss the design and the impact of a workshop for doctoral students who serve as graduate teaching assistants in higher education teaching in the field of social sciences and humanities. The workshop provides an opportunity of individualized and small group learning for doctoral students, which helps them address discipline-specific pedagogical challenges. It does so by following stages of a full learning cycle: (1) learning the theory of 'backward design' (Wiggins & McTighe, 2005); (2) guided individual session design; (3) teaching the session; (4) reflection and learning from peer experience.

The observations and the feedback from the workshop participants demonstrated that they were able to address many of their expected teaching challenges by shifting the focus from 'the self' to 'the students' (Kugel, 1993) - by applying design thinking in their preparation for teaching. It also contributed to their understanding of the interconnection between learning goals, activities and assessment of student understanding.

Offering workshops such as this one helps close the gap in doctoral education and aims to integrate pedagogical training in their development as future academics.

1. Introduction and Background

Faculty development programs, by now, have become crucial in academic practices at universities, albeit there are regional differences in terms of how widespread these programs are. In Central and Eastern Europe such programs exist sporadically or have only begun to be established. Certificate programs that prepare future faculty, i.e. doctoral students, for teaching in higher education are even more scarce (Dorner & Renc-Roe, 2016). Still, the need for socializing doctoral students into the academic community (Mårtensson, 2014) and supporting them in developing an agency for career progression is evident (Feixas, Åkerlind, Stes, & Ion, 2016). At the Central European University (CEU, Budapest, Hungary) the Center for Teaching and Learning (CTL) offers a Program for Excellence in Teaching in Higher Education for doctoral students (CTL Certificate Program) and in addition to this certificate program doctoral students are supported in various ways in their advancement as university teachers.

CEU is an international, US accredited graduate institution offering MA and PhD programs in social sciences and humanities. As part of the doctoral program requirements, doctoral students serve as Teaching Assistants (TAs) for at least one semester. Considering the CEU context, PhD students teach MA level courses, with highly diverse and international student cohorts. TAs are not alone responsible for a course (i.e. they work with the lead instructor), however, they receive no systematic pedagogical training within the doctoral program. Due to this lack of pedagogical training and experience, as well as the unique classroom environment at CEU, many TAs perceive teaching as a challenge. To address this gap, the CEU Center for Teaching and Learning created a series of workshops targeting the specific needs of TAs. These workshops run in parallel with CTL Certificate Program.

2. Workshop description and Methods

The workshop design was inspired by Kugel's (1993) model of how professor develop as teachers: from emphasis on teaching (self, content), to emphasis on learning (students). In line with this model, most of the challenges TAs anticipated are typical for early career teachers: focus on their performance, presentation of the content, and how to stay in control of their teaching in terms of structuring the class, timing, facilitating the discussion, and keeping a focus throughout the session. In this sense, the aim of the workshop series was to support TAs in addressing those challenges by shifting the focus from teaching and *self* to students and their learning, using the 'backward design' framework (Wiggins & McTighe, 2005).

The workshop provides an opportunity of individualized and small group learning for TAs. It does so through four steps:

1. Learning the theory of 'backward design' where students got introduced to the Wiggins & McTighe's (2005) backward design framework;
2. Guided session design through individual consultations about session plans;
3. Teaching the session at their respective department;
4. Reflection and learning from peer experience in the final group discussion.

To assess the success of the workshop in terms of addressing the challenges of TAs, and the shift from (self) teaching to (student) learning, we analyzed TAs' anticipated teaching challenges prior to the workshop (phase 1), their teaching plans (phase 2), as well as final reflections and feedback (phase 4).

3. Workshop Findings

The discussion with the TAs in the first workshop revealed that TAs are concerned with their own teaching performance and comprehensive coverage of the disciplinary content, which is consistent with the theories of teacher development (e.g. Åkerlind 2007, Fox 1983, Kugel 1993). The following sections present how the workshop contributed to TA's development as teachers: the shift from own teaching to student learning, and the shift from content coverage to an active learning approach.

3.1. The shift from own teaching to student learning

The challenges TAs highlighted were related to their teaching performance, and included staying in control of their teaching, structuring the class, timing, facilitating the discussion, and keeping a focus throughout the session. Only a few considered a student-centered approach and referred to the learning goals for the session. Hence, the workshop introduced the 'backward design' framework (Wiggins & McTighe, 2005) as a way to shift the focus from the *self* to the students. The particular advantage of the framework is starting from the learning outcomes in the design process.

By applying this framework, the TAs learned how to start designing their sessions by first formulating the learning goals, then considering assessment of student understanding, and designing meaningful activities aligned with the learning goals. When participants were asked to reflect on how they used this model for their own session design and teaching

(phases 2 and 3), many of TAs highlighted the focus on students as a starting point of their session planning:

> "[I]nstead of starting the planning focusing on the content (and feel overwhelmed), starting from the perspective of students and what it is crucial they take home about the class..." (Participant 4)

> "[I learned to] approach planning lectures in a more bottom-up way (i.e. starting with what I want the students to walk away with first), and trying different methods for creating a more interactive classroom… [I learned to] think critically about what each part of the class should to help the students come to the learning objective I choose at the start of planning." (Participant 6)

This focus on the students and referring to the learning outcomes, as the TAs' feedback shows, stand in contrast to their initial approach to session design reported at the beginning of the workshop. This indicates the shift from focus on *self* and their own teaching to student learning.

3.2. The shift from content coverage to active learning

Initially, when asked about how they would start preparing for a session, TAs mostly referred to content and selecting the readings, preparing the slides or the lecture, summary of the topic, and the main arguments. Accordingly, activities they would prepare would mostly be focused on delivering the content, such as lecturing, student in-class presentations, and questions about the content. A few TAs mentioned active learning strategies such as case teaching or applied exercises.

As the workshop proceeded, types of activates TAs designed were focused on student understanding, rather than on content delivery and coverage, as evident from their teaching plans. Moreover, these active learning strategies enabled them to check for student understanding. For instance, most of the TAs designed small group work and discussion-based seminars, case teaching, interactive lecturing, application exercises, experiential learning activities. Additionally, TAs planned for a meaningful integration of student presentations in the overall session design to support the learning goals of the session. Many of these teaching strategies were going beyond the mainstream teaching practices at their respective departments. In addition, in the feedback, the TAs identified the importance of planning for student engagement as one of the most prominent takeaways from the workshop:

> "[The first session] set the ground of my planning - what do I want students to retain, how can I make this happen, through which tools? - and the individual session was really useful in helping me thinking about the questions … to start from [how] to engage students and achieve my goal…" (Participant 1)

> "The design process was an essential part of my preparation, […] For the future, I think I will be able to implement more and more design process into my lectures and explore the fascinating world of various, more inclusive and effective educational styles that go beyond classical top-down lecturing." (Participant 4)

4. Conclusions

The observations and the feedback from the workshop participants demonstrated that they were able to address many of their expected teaching challenges by shifting the focus from 'the self' to 'the students: the shifts from own teaching to student learning, and from content coverage to active learning approach. It also contributed to their understanding of the interconnection between learning goals, activities and assessment of student understanding. Moreover, as the feedback from the workshop demonstrated, providing structure for session planning through backward design model gave TAs a sense of security and confidence, and reduced anxiety related to teaching. Therefore, offering workshops such as this one helps close the gap in doctoral education and aims to integrate pedagogical training in their development as future academics.

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La Agenda 2030 para el desarrollo sostenible: nuevo escenario para la incorporación del aprendizaje transversal de la igualdad de género (IG, ODS n.º 5)

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Resumen

La Universidad, como entidad educadora proveedora de valores, tiene un papel importante que desempeñar en la promoción de los Objetivos de Desarrollo Sostenible (ODS). En concreto el ODS n.º 5 aborda la cuestión de la IG. En este artículo se presenta una reflexión sobre cómo están actuando los códigos de género en la universidad y evalúa la medida en la que el alumnado de la Escuela de Negocios y la Facultad de Empresariales de Bilbao adquiere competencias en esta área concreta.

Abstract

The University, as an educational provider of values, has an important role to play in the promotion of the Sustainable Development Goals (SDOs). Specifically, ODS No. 5 addresses the issue of GI. This article presents a reflection on how gender codes are acting in the university and evaluates the extent to which the students of the Business School and the Faculty of Business Administration of Bilbao acquire competences in this specific area.

1. Introducción: Las competencias de IG en el proceso de enseñanza-aprendizaje

En 2015, la Asamblea General de la ONU adoptó la Agenda 2030 para el Desarrollo Sostenible. La Agenda plantea 17 Objetivos de Desarrollo Sostenible (ODS) de carácter integrado e indivisible que comprenden las esferas económica, social y ambiental. La Agenda 2030 para el desarrollo sostenible propone un nuevo escenario de actuación a favor de la paz, la justicia, la promoción de la educación, el desarrollo económico sostenible y la igualdad de género. En lo que respecta a esta última cuestión, en concreto el ODS5, hace alusión a la necesidad de Garantizar un modelo de igualdad de género. Cuestión que parece relevante, habida cuenta los patrones de selección de carrera por criterios de género asumidos tradicionalmente y vigentes en la actualidad (Buendía y Olmedo, 2002); las dificultades que presenta la juventud para detectar las discriminaciones de género en sus propias vidas (Donoso, Figuera y Rodríguez Moreno, 2011); al margen de las dificultades que presenta la juventud para detectar las discriminaciones de género en sus propias vidas (Donoso, Figuera y Rodríguez Moreno, 2011) y el extenso rechazo que la juventud muestra hacia el movimiento feminista (Barbera y Cala, 2008; Ventura, 2008).

En consecuencia, las instituciones educativas han de tomar el testigo y ser líderes en su desarrollo ante el reto por lograr implementar un modelo igualitario. Es decir, las Universidades han de tener un rol activo para el fomento de un modelo educativo basado en la igualdad entre las personas, independientemente de su cultura, raza, etnia o género.

En concreto, la UPV/EHU tiene un compromiso firme con el cumplimiento de la Agenda 2030, mediante la incorporación de manera transversal del aprendizaje en torno a los ODS a través del desarrollo de competencias para el desarrollo sostenible, tanto entre el alumnado, como el PDI y el PAS. En concreto, en lo que respecta en concreto al ODS relativo a la igualdad de género, es necesario que el alumnado adquiera una serie de competencias transversales relacionadas con la ética, la RS, y la IG.

Sin embargo, la ausencia en los programas docentes de los conocimientos aportados por la investigación feminista y de género, por omisión, contribuye a la naturalización de las diferencias construidas y a la reproducción de códigos de género (Ballarín y otros, 2009).

Por ello, en el marco de un Proyecto de Innovación Educativa (PIE 2018-19) financiado por la UPV se ha establecido precisamente como objetivo la medición de la percepción del alumnado sobre la situación de la IG en el proceso de enseñanza-aprendizaje en la UPV/EHU, concretamente, en las Facultades de Economía y Empresa de Elkano y Sarriko.

2. La percpeción del alumnado con respecto a la formación en IG

La investigación se realizó entre los meses de septiembre de 2018 y enero de 2019 entre el alumnado pertenecientes a la Facultad de Negocios de Elcano y la Facultad de Ciencias Económicas y Empresariales de Sarriko, en Bilbao. de primer, segundo y tercer año de grado empresarial. Las características de la muestra se muestran a continuación (Tabla 1).

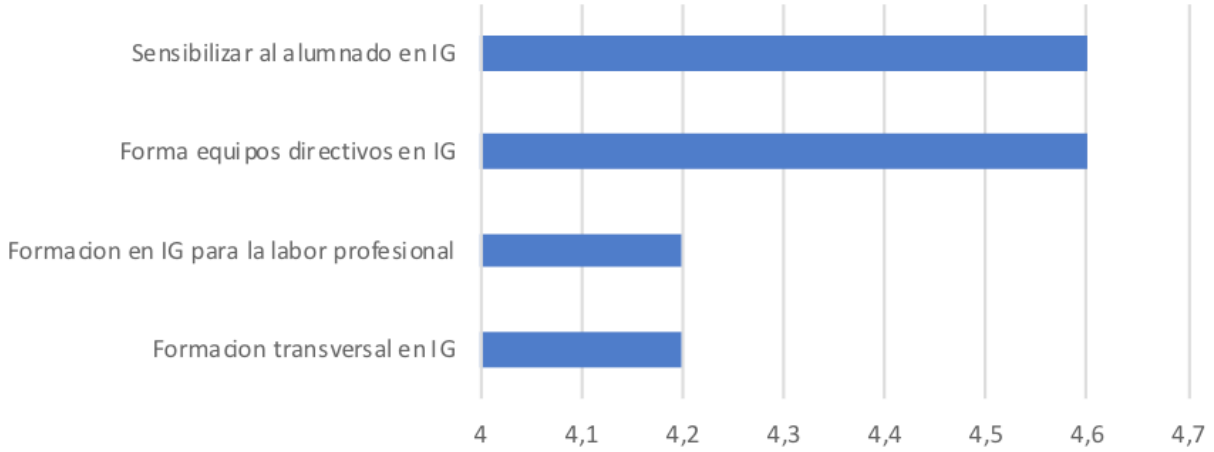
Tabla 1
Caracterización de la muestra

	Numero de respuestas	Edad media	Años en la Universidad
Mujeres	188	20.7	2.4
Hombres	234	20.8	2.5
Total	422	20.7	2.5

En términos generales, el alumnado considera que la formación en IG es relevante y que la universidad juega un rol muy importante en la sensibilización en esta materia. En concreto, el alumnado cree que es necesaria la sensibilización en materia de igualdad de género en la universidad (4,6 sobre 5 puntos) y para ello, considera que la formación transversal de esta materia es muy aconsejable (4,2 sobre 5 puntos). A su vez, lo ven como una materia importante de cara a su futuro profesional (4,2 sobre 5 puntos) en la que consideran que los equipos directivos deben tener formación sobre este tema (4,6 sobre 5 puntos).

Si consideramos la distinción por sexo, sí que se han detectado ciertas diferencias. Si bien ambos colectivos consideran importante la sensibilización en IG al alumnado, tal y como puede apreciarse a continuación, **existen diferencias significativas entre ellas y ellos a la hora de valorar la necesitad e importancia de la inclusión de la IG en la universidad.**

Figura 1
Importancia de la formación en IG para el alumnado



Importancia de la **formación transversal en género** en las asignaturas del grado:

	General	Hombres	Mujeres
1 = En absoluto	1,4%	3,2%	0,0%
2 = En grado mínimo	1,6%	3,8%	0,0%
3 = En grado medio	14,1%	21,1%	8,5%
4 = En buena medida	42,1%	47,0%	37,6%
5 = En grado excelente	34,4%	18,9%	47,4%
NS/NC	4,9%	4,3%	5,1%
(en blanco)	1,4%	1,6%	1,3%

La **formación en género** es **necesaria para poder desempeñar mi labor profesional**

	General	Hombres	Mujeres
1 = En absoluto	1,6%	3,2%	0,4%
2 = En grado mínimo	3,3%	4,9%	2,1%
3 = En grado medio	14,6%	21,6%	9,0%
4 = En buena medida	38,4%	41,6%	35,5%
5 = En grado excelente	38,1%	24,9%	48,7%
NS/NC	2,8%	2,7%	3,0%
(en blanco)	1,2%	1,1%	1,3%

Importancia de la **formación de a los equipos directivos en igualdad de género** y en prevención y detección de la violencia de género

	General	Hombres	Mujeres
1 = En absoluto	0,9%	1,6%	0,4%
2 = En grado mínimo	1,4%	3,2%	0,0%
3 = En grado medio	3,5%	5,4%	2,1%
4 = En buena medida	23,8%	35,1%	15,0%
5 = En grado excelente	68,0%	51,9%	80,8%
NS/NC	1,2%	1,6%	0,4%
(en blanco)	1,2%	1,1%	1,3%

Considero **importante sensibilizar en igualdad de género** al alumnado

	General	Hombres	Mujeres
1 = En absoluto	1,4%	2,7%	0,4%
2 = En grado mínimo	0,5%	0,5%	0,4%
3 = En grado medio	4,2%	7,4%	1,7%
4 = En buena medida	25,5%	35,1%	17,5%
5 = En grado excelente	66,6%	51,6%	78,6%
NS/NC	0,7%	1,6%	0,0%
(en blanco)	1,2%	1,1%	1,3%

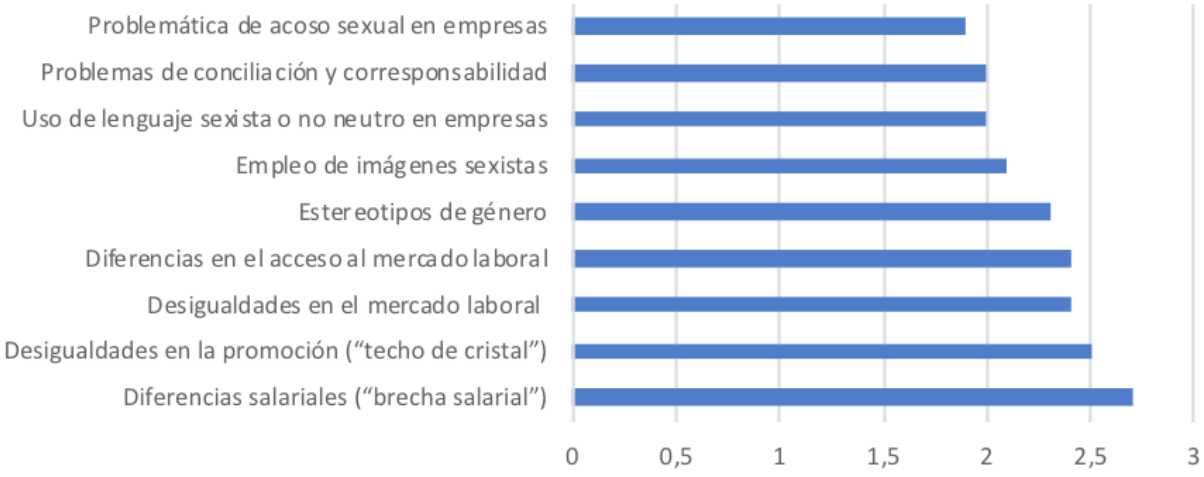
Sin embargo, al preguntarles por la **formación específica recibida en aspectos con**cretos de IG, por lo general indican que la **formación ha sido escasa o muy escasa**. Destaca el apartado concreto de las **diferencias salariales entre hombres y mujeres ("brecha salarial")**, siendo este un tema que se aborda en un grado medio en las aulas, pero sin que parezca que se aborde en profundidad. Tiene cierta lógica, al tratarse de un tema asociado a los estudios que realiza el alumnado de la Facultad de Económicas y de la Escuela de Negocios. Por el lado opuesto destaca la cuestión de la **problemática de acoso sexual en empresas**, que parece ser **el tema menos abordado** de entre los que se han planteado.

Tabla 2
Formación específica en temas relacionados con la IG

	General
Diferencias salariales ("brecha salarial")	2,7
Desigualdades en la promoción ("techo de cristal")	2,5
Desigualdades en el mercado laboral	2,4
Diferencias en el acceso al mercado laboral	2,4
Estereotipos de género	2,3
Empleo de imágenes sexistas	2,1
Uso de lenguaje sexista o no neutro en empresas	2,0
Problemas de conciliación y corresponsabilidad	2,0
Problemática de acoso sexual en empresas	1,9

* 1 = En absoluto, 2 = En grado mínimo; 3 = En grado medio; 4 = En buena medida, 5 = En grado excelente.

Figura 2
Formación específica en IG por temas tratados

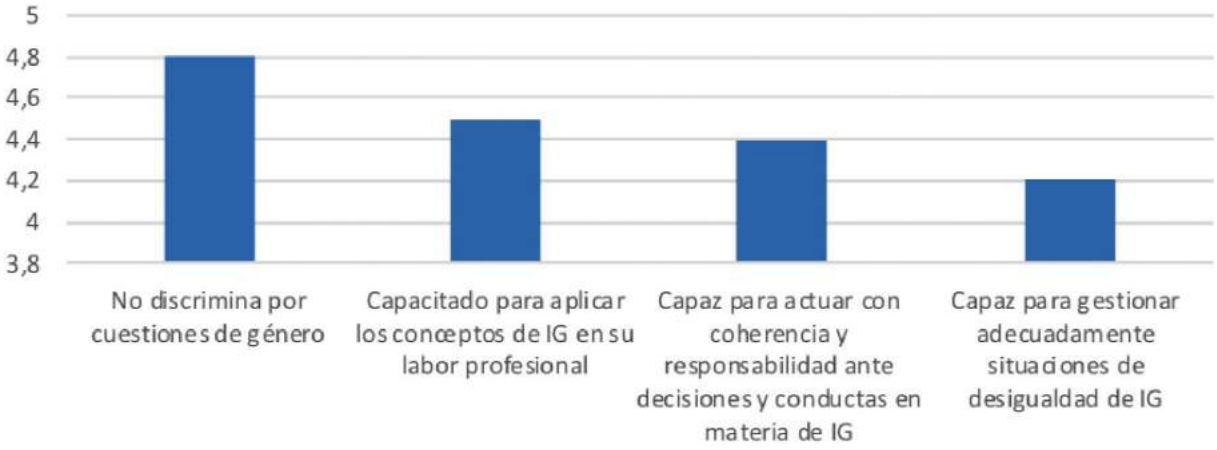


Resulta curioso que el alumnado dice tener un grado medio de formación al respecto (3,3 sobre 5 puntos), a pesar de no ser temas ampliamente abordados en la Universidad, cuando se les pregunta por la capacidad que consideran tener para poder abordar estas cuestiones en su futura labor profesional parece que son bastante optimistas.

No sabemos si la labor es previa a la universidad, pero en términos generales parece que la sensibilización en materia de IG ha dado sus frutos dado el alumnado dice no discrimina por cuestiones de género (4,8 sobre 5)

Figura 3

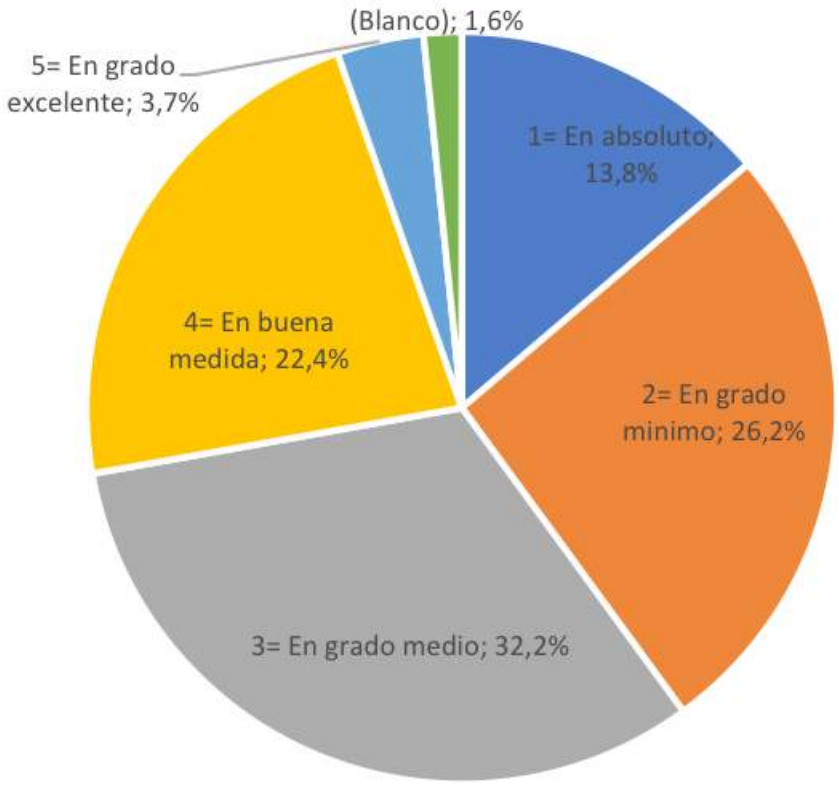
Capacidad del alumnado para gestionar y aplicar la IG



Por otro lado, y pese a no ser temas abordados en profundidad el alumnado se ve altamente capacitado para aplicar los conceptos de IG en su labor profesional (4,5 sobre 5 puntos) y para actuar con coherencia y responsabilidad ante decisiones y conductas en materia de IG (4,4 sobre 5 puntos), así como para gestionar adecuadamente situaciones de desigualdad de IG (4,2 sobre 5 puntos).

Figura 4

Cumplimiento de las expectativas sobre la formación recibida en IG



Un aspecto que parece que hay que considerar abordar de manera más intensa es la cuestión relativa al **lenguaje**. Es llamativo la percepción del uso de un lenguaje sexista por parte del profesorado, un tema que el alumnado considera detectar y sobre el que parece que hace un esfuerzo por mejorar (a pesar de que el esfuerzo por el uso de un lenguaje no sexista aun pueda mejorarse de forma particular. En concreto, no se han detectado diferencias significativas entre los que usan un lenguaje no sexista —3,5 sobre 5 puntos— con respecto al uso de un lenguaje sexista —3,3 sobre 5 puntos—).

A pesar de que **un alto porcentaje de la gente considera que sus expectativas sobre la formación en IG están satisfechas**, probablemente la universidad podría hacer más al respecto. Evidentemente, y pese a ser un tema de interés general pero que no está incluido en el currículo universitario puede haber disparidad de motivación e intereses para su estudio. Ahora bien, parece que es un tema que llama la atención y que tiene posibilidades de tener una buena acogida. Más aún si consideramos que podría ofrecerse como una asignatura opcional o trabajarse a varios niveles y con diverso grado de profundidad en función del interés de cada persona. A este respecto, **se ha detectado un colectivo nutrido de personas que indica que de ningún modo ha visto cubiertas sus expectativas al respecto (13%)**. También hay **un colectivo importante, que representa más de una cuarta parte de la comunidad universitaria (26,2%) que ve cumplidas sus expectativas en un nivel mínimo**. Por tanto, parece que hay un nutrido grupo que probablemente reclama algo adicional al respecto. Seria responsabilidad de la universidad, por tanto, analizar qué aspectos podrían trabajarse y determinar la metodología y recursos necesarios para ello.

Al preguntarles si consideran que **la Facultad hace lo suficiente para promover la igualdad de género en la docencia, casi un tercio de los encuestados,** siendo este **el grupo mayoritario, considera que la universidad hace algo, pero que no es suficiente (32,9%).**

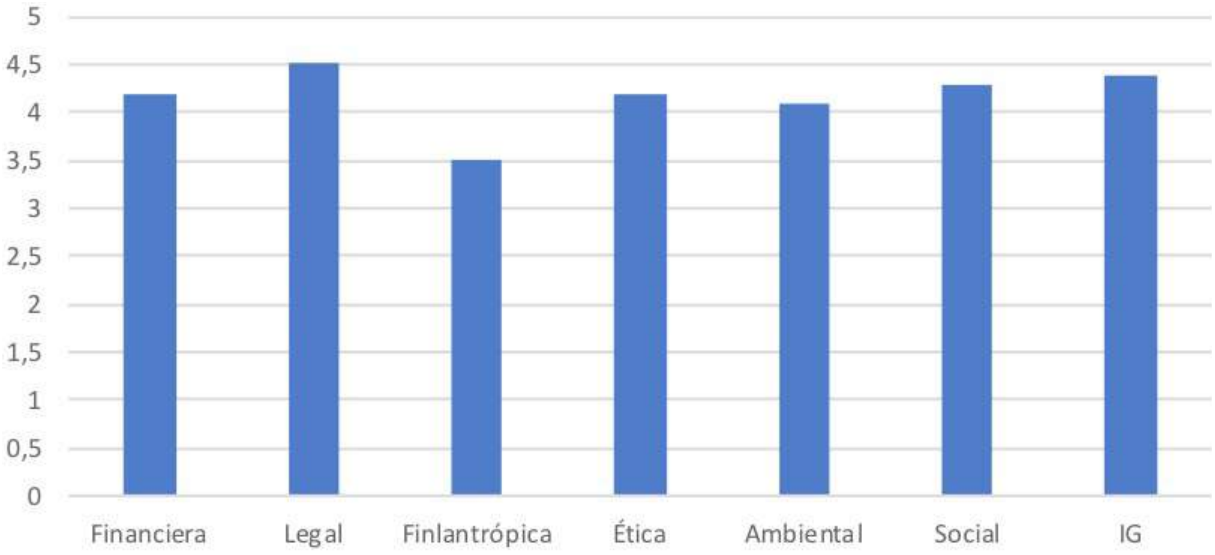
Tabla 3
Percepción del esfuerzo realizado por la universidad para promover la IG

No lo sé	27,8%
En absoluto	17,3%
Sí, pero no lo suficiente	32,9%
Sí, lo suficiente	18,2%
Sí, más que suficiente	3,3%
(Blanco)	0,5%

Para atender a la demanda previa, se ha analizado los diversos aspectos que podrían incorporarse dentro de la formación universitaria. Entre los temas destacados, parece que **el alumnado considera que la Facultad debería ser un ejemplo en materia de educación para la IG** y cree que, para ello, se colaborar con el tejido empresarial para proporcionar una educación responsable en aspectos de IG (4,1 sobre 5); también **se debería promover el espíritu crítico en IG a través de la docencia** (4 puntos sobre 5). Destaca también la alusión a la **formación en los Objetivos de Desarrollo Sostenible,** como tema general que aborda, de forma parcial, la cuestión de la equidad de género junto con otra serie de aspectos sociales y ambientales. **El estudio de la RSE y de la sostenibilidad ambiental son temas relevantes** y que han resultado ser calificados como temas a trabajar a futuro (4 puntos sobre 5).

A este respecto, **el alumnado es crítico** y sí que en un alto porcentaje **considera que para ello han de darse cambios en el sistema educativo para incorporar aspectos relativos a la IG**.

Figura 5
Tipos de responsabilidades que debería asumir la empresa
(entre las cuales se incluye la IG)



Entre los temas afines a la IG, la RSE y los ODS son los temas que en mayor medida se abordan en la Facultad. Estos son precisamente los temas más amplios y complejos en los que la presencia especifica de la IG tiene cabida, pero de forma parcial. Por tanto, consideramos que quizá el peso específico que ha de dársele a la IG probablemente tenga que ser aún mayor.

Resulta curioso que al preguntar por los tipos de responsabilidad que deberían asumir las empresas, la IG toma una posición relevante (4,4 puntos sobre 5), solamente superada por su responsabilidad legal. En este caso, todos los aspectos —salvo la filantropía— son considerados temas de importantes a muy importantes.

La IG es considerado como una responsabilidad incluso más prioritaria que la financiera. Pero a este respecto, consideran que la rentabilidad y la IG son compatibles y que **las empresas deberían implicarse más en promover la IG 4,3 puntos sobre 5).**

En términos generales **gran parte de los encuestados estarían muy interesados en trabajar en empresas y organizaciones que consideran de forma explícita la IG** en sus políticas. La inmensa mayoría lo valora en buena medida o de grado excelente.

Por último, se ha preguntado al alumnado por su predisposición a renunciar a parte del salario a cambio de que su empresa aborde temas relativos a la IG. una gran parte de los encuestados dice estar **dispuesto a renunciar a un aparte del sueldo por que su empresa incorpore cuestiones relativas a la IG** (no estereotipos de género, no discriminación salarial, protocolo de acoso sexual, etc.). Lo curioso es que los porcentajes a los que renunciaría han resultado ser relativamente elevados, mayores a lo esperado. Son aspectos muy valorados la no discriminación por género ni en la promoción interna ni en el salario. Sin embargo, nos ha reseñable la mayor disposición a renunciar a una parte del salario (en este caso superior al 20% de media) en el caso en el que la empresa tenga un **protocolo de acoso sexual**.

Somos conscientes del sesgo de la pregunta, dado que no hay ningún tipo de implicación directa al respecto y puesto que el alumnado realmente no va a poner dinero de su bolsillo. Ahora bien, la relativa voluntad de asumir el sacrificio personal parece ser un detonante para abordar esta cuestión desde un prisma de contribución particular y su contribución al beneficio social colectivo.

3. Conclusiones

Sin pretender ser exhaustivos en este apartado debido a que aún estamos en la fase inicial del análisis de resultados podemos avanzar una serie de corrientes que no pueden ser catalogadas como conclusiones, pero sí como tendencias detectadas.

Tras un análisis exploratorio se ha detectado que **el alumnado muestra una sensibilidad mayor de lo esperada sobre el tema de la IG**. Como cabría esperar la sensibilización por el tema es mayor entre las chicas, pero ellos también se sienten interesados por el tema y creen que es necesaria su inclusión como materia a tratar en las aulas. Sin embargo, un nutrido grupo de estudiantes considera que **la formación al respecto no es suficiente y se plantean la necesidad de incorporar cambios en el modelo educativo para incorporar estos temas**, si bien no se entra a valorar en detalle qué tipo de modificaciones han de ser implementadas.

Por otro lado, **la IG es considerada como una responsabilidad empresarial clave** y cabe indicar que el alumnado valora muy positivamente incorporarse en su futuro profesional a una empresa que considere de forma estratégica la IG. Incluso, se plantea la posibilidad de renunciar a parte de su salario por incentivar la misma.

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Gizarte gaitasunen trebakuntzan ikasleriak parte hartzea sustatzearen erronka

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Laburpena

Komunikazio eta Gizarte Gaitasunak eta Ikerkuntza-erremintak Ingeniaritzan irakasgaia Gasteizko Ingeniaritza Eskolako Automobilgintzaren Ingeniaritzako Graduan irakasten da, Euskal Herriko Unibertsitatean (UPV/EHU). Adarreko oinarrizko irakasgaia izanik, Graduko arlo espezifikoarekiko guztiz zeharkakoak diren gaiak jorratzen ditu. Honela, irakaskuntza-taldearen erronka handia da ikaslea motibatua sentitzea irakasgaiaren jardunean; eta noski, hau lortzeko modu bakarra dinamika bidezko irakaskuntza gauzatzea izango da, ikasleen parte-hartze aktiboa ahalbidetzen duena eta bide batez bere formakuntzaren protagonista nagusi bihurtzen duena.

Irakaskuntza aktiboko metodologiak erabiliz, ikasleak adimen emozionala, enpatia, asertibitatea eta aditze aktiboa eta gisako erreminten inguruko entrenamendua egiten du irakasgaiko irakaskuntza -emaitzak lortu ahal izateko. Trebatze-prozesu honek ikasleekin etengabeko elkarrekintza dakar, eta baita taldearen kohesioaren areagotzea ere.

Logikoki, parte-hartzea da irakaskuntza mota honen ardatza. Honela, autoezagutza eta garapen pertsonalarekin, talde-lanarekin eta lidergoarekin eta, noski, komunikazioarekin zerikusia duten dinamikak gauzatzen dira. Azken honen harian, adibidez, feedback-mezua osatu, eman eta jasotzeko prozesuaren entrenamendu intentsiboa egiten da.

Bi urteko ibilbide honetan egiaztatu ahal izan dugunez, nahiz eta hasieran ikasleek irakasgaiak eskainiko dienaren baliagarritasunaren itxaropen handiegirik ez duten, behin ikastaroa amaitzen dutenean, barneratu duten guztiaz harrituta sentitzen dira eta beren etorkizunerako oso onuragarriak izango dituzten gaitasunak landu direlako sentsazioa dute, bai bizitza akademikorako, profesionalerako, eta baita pertsonalerako ere.

Abstract

Social and Communication Skills and Tools for Research in Engineering is a subject offered in the first year of the Bachelor's Degree in Automotive Engineering, in the Faculty of Engineering of Vitoria-Gasteiz, at the University of the Basque Country. As a basic subject within this field, it has the capacity of being transversal to the other topics in the degree. In this context, it ensures that students will find motivation which is always a challenge for the lecturers. Undoubtedly, this is achieved by proposing dynamics linked to the conceptual contents, which requires the involvement of the students.

The use of active methodologies in this teaching-learning process, which allows us to secure that the student receives and completes constant training in tools such as Emotional Intelligence, Empathy, Assertiveness, Active Listening, etc., is related to obtaining the learning outcome in a procedure that requires constant interaction with the students and a high cohesion of the group.

Logically, participation is the fundamental axis of this learning process. The methodology is based on dynamic exercises related to the knowledge and personal development, the teamwork and the leadership, and, particularly, communication. In the field of communication, for example, intensive training is given on the composition, delivery and reception of a feedback message.

In the first two years of this discipline, it has been possible to verify that, although at the beginning of the course the students' expectations for this subject were low, upon completion they were surprised by what they learned. They appreciated that the acquired skills can be useful, not only in their academic life, but also in their professional path as well as on a personal level.

1. Sarrera

Boloniako prozesua unibertsitatean txertatu zen mementotik, unibertsitateko ingeniaritza-ikasketen paradigma aldatu da, eta gizartearen beharretara egokitu [1]. Hau dela eta, ikasketen planen garapenetan, enpresariek profesional berrien heziketan beharrezkotzat daukatenaren eskaria kontuan hartu da [2]; eta honela, plangintza hauetan, gaitasun generiko edo zeharkakoen agerpenari lekua egin zaio, automobilgintzako txostenean [3] ikus daitekeenez.

Ikerketa honetan, titulu-edukietatik guztiz zeharkakoa den irakasgai baten metodologia azaltzen da, non beharrezkoak kontsideratzen diren gizarte trebetasunak lantzen diren.

2. Zeharkako gaitasunak ingeniaritzan

Gaur egun UPV/EHU dauden ingeniaritza-ikasketetan antzeko zeharkako gaitasunak (ZH) lantzen dira. Segidan, Gasteizko Ingeniaritza Eskolan (GIE), Ingeniaritza Mekanikoko Graduan egiaztatutako memorian [4] agertzen diren ZH aipatzen dira:

- C10. Inguru eleanitza eta diziplina anitzeko batean lan egiteko ahalmena.
- C12. Etengabeko prestakuntzak planteatzen duen erronka kontuan hartuz, arduratsu, lanean ordenatua eta ikasketen aurrean gogotsu jardutea.
- C13. Metodologia zientifikoaren estrategiak aplikatzea: egoera kualitatiboki eta kuantitatiboki analizatzea; eta, ingeniaritza industrialaren eredu propioak erabiliz, soluzioak eta hipotesiak planteatzea.
- C14. Taldeetan era eraginkorrean lan egitea, trebetasunak eta ezagupenak uztartuz, ingeniaritza industrial alorrean erabakiak hartu ahal izateko.

Honetaz gain, GIEn, honako gaitasun espezifikoa zeharkakotzat jo daiteke:

- C4. Arazoak konpontzeko eta erabakiak hartzeko ahalmena, sormena, arrazoinamendu kritikoa eta ideiak eta ezagutzak transmititu eta komunikatzeko trebetasuna.
  Automobilgintzaren Ingeniaritzan [3], espezifikoki, goian aipatutako C10, C14, C12 eta C4 agertzen dira zeharkako gaitasunen bezala. Honetaz gain, honako hau ere azaltzen da:
- CT4. Ikuspuntu eta erreminta konputazionalak erabiliz, ingeniaritzako arazoak konpontzeko ahalmena.
  Baina titulazio honetan, gaitasun espezifiko bezala, beste hau aurkezten da, gainerako graduetan ez dagoena,:
- FB7FB7. *Automobilgintzako ingeniaritza esparruan, berrikuntzako konpetentziekin, era autonomo eta eraginkorra taldean lan egiteko ahalmena, komunikazioko oinarrizko trebetasunak eta estrategiak erabiliz.*

Automobilgintzako beharrezko trebetasun pertsonal, instrumental eta sistemikoak garatzeko ahalmena.

Azken honek (“*trebetasun pertsonal, instrumental eta sistemikoak garatzeko ahalmena*”) Tunning proiektuan [5] agertzen diren gaitasun eta trebetasun generikoei egiten die erreferentzia, zeinak beste gradu-ikasketen plangintzetan zeharkako gaitasunetan baitira.

Gaitasun eta trebetasun generikoetan, trebetasun eta ahalmen kognitiboak zein motibaziozkoak elkartzen dira eta hiru multzotan sailkatzen dira: **instrumentalak**, **pertsonartekoak** eta **sistemikoak**. Instrumentaletan, tresna-funtzioa daukatenak elkartzen dira; pertsonartekoetan, aldiz, pertsonek indibidualki zein taldetan dauzkaten gaitasunak batzen dira; eta, azkenik, sistemikoen barnean, elementu desberdinen erlazioak eta loturak ahalbidetzen dituztenak.

Tuning proiektuan [5], enpresei, graduatuei eta akademikoei galdetu ondoren, 30 gaitasun onartu ziren, hiru multzo horietan sailkatuak; gaitasun horiei, aurreratzean, **gizarte-trebetasun** iritziko zaie. Trebetasun hauek oso garrantzitsuak dira gaur egun agerian dagoen enpresetako antolaketaren kulturaaldaketarako, [6] erreferentzian adierazten den bezala.

Gizarte-trebetasunek pertsona batek bere baitan dituen ikasitako jokaeren multzoa osatzen dute, zeinek beste pertsona batzuekin sortzen diren harremanen kalitatea eta eraginkortasuna areagotzea lortzen baitute [7]. Gaur egungo ingeniaritzaren jarduna diziplina, hezkuntza eta kultura desberdinetako pertsonen arteko elkarlanean egiten da [8]. Beraz, arlo profesionaleko gizarte-harremana aberatsa eta eraginkorra izan dadin, beharrezkoa da ingeniaritzaren hezkuntza-arloan gaitasun sozialen trebakuntza aurrera eramatea [8].

Gizarte-trebetasunak, ingelesez *soft skills* izenez ere ezagutzen direnak, gaitasun teknikoen (*hard skills*-en) osagarri garrantzitsuak dira, eta azken hauek praktikan jartzeko beharrezkoak izango dira [9]. Trebetasun hauek, sailkapen hedatuenaren arabera [10], sei multzotan bana daitezke:

— Lehen gizarte-trebetasunak.
— Gizarte-trebetasun aurreratuak.
— Sentimenduekin erlazionatutako trebetasunak.
— Erasoa ekidin eta saihesteko trebetasunak.
— Estresari aurre egiteko trebetasunak.
— Planifikazio-trebetasunak.

3. Automobilgintzan gizarte-gaitasunen trebetasuna

2017-18 ikasturtean, Gasteizko Ingeniaritza Eskolan (UPV/EHU), Automobilgintzaren Ingeniaritzako Gradua martxan jarri zen. Ingeniaritza honen berezitasuna irakaskuntza duala dela da; hau da, 42-56 ECTS kreditu enpresetan egin behar dira 3. eta 4. mailako ikasketetan.

Honek ikasleria enpresan egingo den ikaskuntza-aldirako prestatzera behartzen du; eta honela, plangintzaren diseinua egin zenean, lehenengo mailan eta oinarrizko adarrean kokatuta, ***Komunikazio eta Gizarte Gaitasunak eta Ikerkuntza Erremintak Ingeniaritzan*** irakasgaia definitu zen.

Izena aztertuz, irakasgaia hiru zatitan banatuta dagoela jo daiteke: komunikazio Gaitasuna, gizarte-gaitasuna eta ikerketa. Baina, plangintzaren edukiak [3] hausnartu ondoren, irakasgaia bost sekziotan antolatuta geratzen da, honako helburuekin (1. taula):

1. taula
Irakasgaiaren sekzioak eta helburuak

Sekzioak	Helburuak
Adimen Emozionala (AE)	— Adimen emozionala zertan datzan azaltzea eta pertsonen arteko erlazio eraginkorra izateko duen garrantzia ezagutzea. — Gatazkaren dinamika ulertzea eta konponbiderako estrategiak garatzea.
Komunikazioa	— Komunikazio eraginkorra eta inklusiboa lortzea.
Talde-lana eta lidergoa	— Talde-lanaren eta antolakuntzaren garrantziaz jabetzea, rolak desberdinduz.
Generoa	— Genero ikuspuntutik ingeniaritzaren egoera hausnartzea eta inklusibitatea suspertzea.
Ikerketa	— Ikerketa-lan baten egitura eta beharrezko diren tresnak erreferentzia bibliografikoetarako ezagutzea.

Irakaskuntza helburu hauek kontuan hartuta, irakasgai honetan arrakasta izan dezakeen irakaskuntza-metodologia bakarra **metodologia aktiboa** [11] da. Are gehiago, irakasle-ikasleen arteko lan-saioak entrenamendu-saiotzat jo daitezke. Honela, trebetasun jakin bat landu ahal izateko prestakuntza hiru fasetan ematen dela esan daiteke: autodiagnostikoa, garapena eta ebaluazioa; [7]-an proposatutakoarekin, hein handi batean, bat etorriz.

Autodiagnostikoa jorratuko den trebetasuna ikasleak baduen eta zein mailatan eta egokieratan duen aztertzean datza. Hori da lehenengo pausoa; horretan, ikaslea ohartuko da zer gabezia dauzkan, eta zenbait kasutan konturatuko da ikasi ahal izateko lehendabizi "ikasitakoa ahaztu" egin behar duela. Norberak egin beharreko hausnarketa izan ohi da autodiagnostikoa, eta ikaslearentzat onuragarria da guztiz; izan ere, Graduko ikasketak hasten dituen mementoan bere barnera egiten duen begirada garapen pertsonalerako funtsezkoa izango baita [12]. Autodiagnostikoa egiteko erreminta desberdinak erabiltzen dira: testak, asertibitatea, enpatia, aditze aktiboa eta gisako trebetasunak [13]. Aurretik izan dituzten esperientzietara jotzea ere hausnarketa egiteko oso baliagarria izan ohi da; izan dituzten gatazkak, taldelana nola egin duten, nola komunikatzen diren, etab.

Trebakuntza edo trebetasunaren **garapena,** oinarri teoriko batetik hasten bada ere, ekintza praktikoetan oinarritzen da. Simulazioak eta role-playing dinamikak [14] talde txikietan egiten dira, bi edo hiru pertsonaz osatutakoetan, alegia. Edukiak teoriatik praktikara pasatzeko era oso egokiak dira dinamika hauek, ariketa eta egoera konkretuetan oinarritzen baitira eta talde txikian erosoago sentitzen baita ikaslea. Ariketa aurrera eramateko izan dituen zailtasunen eta irakaslearen edo beste ikaskideen iruzkinen hausnarketatik lortuko da ikaskuntza.

Komunikazio arloan [15], talde-lana egin ondoren ideien ahozko aurkezpena eta defentsa da irakasgai honetan lantzen den trebetasuna, bereziki hitz gabeko komunikazioan [16] erreparatuz. Entrenamendua lauhilekoan zehar egiten da, aurkezpen sinpleenetik abiatuz eduki teknikoagoak dituenera iritsi arte. Prozesuan, ikus-entzunezko euskarri desberdinen erabilera lantzen da.

Idatzizko komunikazio mota desberdineko zereginetan jorratzen da; e-mailak, aktak, edukien azterketak, hausnarketak, etab. Zeregin garrantzitsuena arlo honetan ikerketa jorratzeko egiten den lan-txostena da. Idatzizko testuaren txukuntasuna, egokitasuna eta zuzentasun gramatikala [17] kontuan hartzen dira noski, baina, baita ere, genero-ikuspegitik, hizkuntza inklusiboaren erabilera egitea eskatzen da [18], [19].

Ikaskuntza-prozesua **ebaluaziorekin** amaitzen da. Ebaluazio-sistema jarraitua diseinatu da, ikaslea ikaskuntza-prozesuaren egoeraz kontziente izan dadin. Honetarako, irakaskuntza-emaitzak lortu dituen eta zein mailatan ezagutu behar du ikasleak; beraz, zereginen feedback-a ebaluazio-prozesuaren gakoa dela esan daiteke. Feedback-a orokorrean irakasleak ematen badu ere, kideek ere, hausnarketa egin ondoren, iruzkinak egingo dituzte.

Ahozko komunikazioren kasuan, feedback-a emateko errubrika batzuk [20] diseinatu dira, zeinetan komunikazio-prozesuaren hainbat item kontuan hartzen diren; edukia, estrukturaketa, hizkuntzaren erabilera eta, batik bat, ahozko komunikazioaren xehetasun guztiak biltzen dira. Errubrika hauek bai irakasleek eta bai ikaskideek betetzen dituzte ikasle baten komunikazio gaitasuna ebaluatzeko. Ondoren, ikaskide batek feedback-a emango dio ikasleari, era egituratuan. Feedback-ak emaileak ikaskideari kritika konstruktiboa emateaz gain, ebaluatzen ari den ikaslearen puntu sendoak eta hobekuntzarako puntuak zein dituen balioztatzen du, eta honek, halabeharrez, norberaren gaitasunari buruzko hausnarketa egitera eramaten du.

4. Balorazioa eta hausnarketa

Aurreko bi urteetan izandako eskarmentua eta UPV/EHUk irakasgaietan egiten dituen inkestetan (1-5 eskalan) oinarriturik lortutako emaitzen balorazioa eta hausnarketa egin da. Kontuan hartuta guztira kurtsoko 40 ikasle ditugula (% 95 gizonezkoak eta % 5 emakumezkoak), bi taldetan banatuta (euskara eta gaztelania), ikasleriaren % 50ek irakasgaia oso erraza edo erraza dela deritzo eta interesa du edukietan. Gainera, % 85 baino gehiago:

— Egunero joaten da irakasgaiaren klaseetara.
— Klasetik kanpo astean 3 ordu baino gutxiago dedikatzen diote irakasgaiari.
— Ez du harrera-ordurik erabiltzen.

Kasu guztietan, autoebaluazioa da gehien baloratzen dutena, batez bestekoa 3,9 izanik; eta, beste kontzeptuetan lortutako emaitzak 2. taulan erakusten dira.

Datu hauei erreparatuz, irakasgaia ondo balioztatuta dagoela esan daiteke. Balio baxuena metodologia atalak du; irakaskuntza-aldian egin diren barne-galdeketetan, ikasleek irakasgaiak lan-zama eragiten diela adierazten dute, adi eta aktibo egon behar dutelako etengabe lan -saioetan. Edozein kasutan, nahiz eta metodologia aktiboetan oinarritzen den irakasgaia den eta asteka lana egitea eskatzen dien, inkestatik ateratzen den moduan, 3 ordu baino gehiago ez diote eskaintzen, beste irakasgaiak lantzeko denbora izanik. Gainera, asteka lan egin behar izatea duen onura klasera joaten direnek lehenengo deialdian gainditzen dutela da.

2. taula
Irakasgaiaren balorazioa

Kontzeptua	Balorazioa (1-5)
Plangintza	3,8
Metodologia	3,3
Garapena	3,5
Elkarrekintza	3,6
Ebaluazioa	3,5

Ikasturte bakoitzean lortutako kalifikazioak aztertuz gero, azken urte honetan hobekuntza bat izan dela esan daiteke (3. taula), «oso ongi» kalifikazioaren kopurua handitu baita; aldiz, «nahiko»ren kopurua murriztu da, 17-18 ikasturtean egindako hausnarketaren hobekuntza lortuta [20]. Dena den, «bikain»en proportzioa jaitsi denez, hurrengo erronka hauek igotzea eta «oso ongi»en kopurua mantentzea izango da. Honetaz gain, harrera-orduetatik ikaslea pasatzea ere ondo legoke.

3. taula
Kalifikazioak ehunekotan

Kalifikazioa	Ikasturtea	
	18-19	17-18
5etik 6,99, nahiko	28,8	57,9
7tik 8,99, oso ongi	68,8	36,8
> 9, bikain	2,5	5,3

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Student engagement experience: Ikas2D volunteering program

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Abstract

Ikas2D is a volunteering program directed to students of the University of the Basque Country-Spain, studying in the Ibaeta Campus, located in Donostia. The aim of this program is to help secondary school students with their homework. These students attend a secondary school nearby the university, they feel demotivated with school and need help with different subjects. University students participanting in Ikas2D go twice a week to this school, after classes are finished. Each session timin is one hour and a half, and the program lasts three months. During this time, they will help school students with homework, bound and become positive referents, as well as develop their community engagement.

1. The Importance of Engagement

Engagement brings many benefits to the student and her/his learning process; develops different competences in the student, who are not given during class sessions. (Kuh, Kinzie, Cruce, Shoup and Gonyea, 2008) Successful student engagement means success in their studies and career prospects: "Engagement raises the passion for lifelong learning and personal development in the mind and heart of the student" (Kuh, 2003).

The degree of engagement or commitment of the students studying the same degree will not be the same. "The success of all learning processes is directly related to the ability to engage in engagement" (Astin, 1985).

1.1. Student engagement at the university

University's objective is to train college students as future professionals, make them active and participatory citizens in the future (Naval *et al.*, 2011).

In order to educate students willing to transform and improve the reality they know, we must deliver democratic values, as well as the competences that society today demands (Santos, 2005; Martínez and Esteban, 2005; Kronman, 2007; Rochford, 2014).

As part of this mission, the university is committed to redirecting the potential human resources that each year receives for the best and most beneficial growth. Instead of limiting the knowledge generated to the classroom, we can apply it in real context to improve the quality of life of individuals. In addition, university plays an important role in promoting innovation as a driving force for social transformation (E. Murillo, I. Lopez, M. Belinchón, 2008).

University must create a powerful network with social organizations and agents to carry out this commitment to community, based on a cooperative way of working, aiming to achieve a better society for everyone.

1.2. Volunteering as a way to develop student engagement

A good way to develop these social skills in students is voluntary programs. As stated by Murillo, Lopez and Belinchon (2008), university students, although they are still in the training process, have enormous potential to offer the university and its community.

University must build a bridge to social insertion, which allows the student to apply theoretical knowledge in a real context, thus guaranteeing the integral education of the person (Arbués, Naval 2014).

2. About Ikas2D

IKas2D is a volunteer program managed by the Didactics and School Organization department of the University of the Basque Country. It is aimed at all students who study at the campus of Donostia, regardless of the degree they are studying.

The creation of the Ikas2D program was given during the 2013-2014 academic year at the faculty of Teacher Training of Donostia, by a group of teachers, Educational Delegation and the Berritzegune of Donostia.

This program lasts three months, during which the students of the University of the Basque Country go twice a week to an institute located in the same neighborhood (Antiguo neighborhood, Donostia) to help the students of the institute to do their homework. The lessons last about an hour and a half.

2.1. Aim and objectives

Aim: This program aims to support the domestic work of children in families with no resources in schools located in the Antiguo neighborhood of Donostia.

Goals:

— Develop social skills.
— Learn to take responsabilities.
— Incorporate positive learning habits and routines.
— Improve frustration with schools and increase motivation.
— Improve self esteem.

IKas2D has two different lines of objectives. On the one hand, for the students of the institute, the objectives that we intend to achieve are; improve their grades, improve their self-esteem and their motivation towards the classes, have positive referents in which to support and internalize routines and correct learning habits.

On the other hand, for the students of the University of the Basque Country, the objectives are; contact reality, enlarge their social skills, develop their professional skills and develop their ability to assume responsibilities. In addition, they receive ECTS (European credit transfer system) for participating in this volunteer program.

2.2. Student profile

When we talk about the profile of the students who participate in this program, they are students of courses from the first of Compulsory Secondary Education up to the fourth year. They have suspended several subjects and feel a general frustration and demotivation towards school. Their families can not afford to pay for an academy, and these students usually spend their afternoons prowling on the street.

2.3. Benefits

When entering IKas2D, kids have a structured schedule, for two evenings a week someone helps them with their homework. This makes them go to class feeling more confident, since they take the homework done, and understand the subject better.

In addition, their "private teachers" are not their usual teachers, with those who are all day, but are young university students, with whom they can, in addition to doing homework, talk about music or video games, etc. All these factors make the students of this institute attend IKas2D very willingly.

The students participating in IKas2De school program come under the supervision of the school. Students from the UPV / EHU will be aware of this, using a flexible and fun method of working to motivate participants in the program. In addition, they will become a positive reference for those who find themselves at the age of adolescence, creating close and trustworthy working relationships.

This whole experience allows our students grow adult and make a meaningful learnings while they participate building their community. They feel professionaly valued, since the work they do is very important. It's a chance they really enjoy having.

3. Program Methodology

This program involves the participation of different agents and, in order to guarantee its proper functioning, all the communication between them is open and fluid. This is the organizational model of the program:

October: Antiguo school presents the student group that will participating on Ikas2D program, along with the Berritzegune of San Sebastian and Education delegation.

November: University of the Basque Country teachers present the project to their students, they make difusion of the program throught all the faculties located in the Donostia campus.

December: Informative meetings with students of the UPV.

January: Program gets started. Monthly evaluation sessions will be held with students, as well as those responsible for the centers.

March: Program gets finished.

May: Program assessment and evaluation will be held with all participants.

3.1. Coordination

As mentioned earlier, the coordination between the different agents is crucial to guarantee the proper development of this project.

Family Coordination: Involvement and implication is required from students' families in order to participate in the program. To that end, the participants in the program sign up a contract with the people in charge of the centers and the participants in the program, where they confirm their involvement with the program.

Information about your child's behavior and work will be exchanged between families and tutors during the continuous of the program. They also participate in the evaluation carried out at the end of the program.

Coordination with the coordinators of the school: Each school appoints a person in charge of IKas2D, whose task is to communicate with the students of the UPV/EHU and to inform them about their homework.

Coordination with the teacher in charge in the University: The head of IKas2D program at the UPV/EHU keeps in touch every month with students from the UPV/EHU and those in charge of the centers.

Finally, at the end of the program, teacher from UPV conducts an assessment and evaluation session with pupils, university students, responsibles from the school, as well as those responsible for Berritzegune and with the families.

3.2. Organization

Each group is made up of at least seven student participants and two volunteer students from the UPV/EHU. Sessions last two hour and a half, twice a week. Days and hours can be adapted to schools.

3.3. Evaluation

The evaluation of the program is UPV teachers responsibility. Every month, this teacher meets the university students students and school responsibles to monitor the program and ensure its proper development.

At the end of the program, a thorough assessment is made both with the participants, as well as with the center's managers, as well as with the families. For this purpose different strategies are used, such as; focus groups, quizzes, etc.

Finally, all participants make improvements proposals to improve the program for the next academic year.

3.4. Quantitative results

School students: The last three years, near 45 school students have participated in Ikas2D; 15 sudent per academic year.

University students: We had 6 university students; 2 each year, from psichology and primary education grades.

Teachers and lecturers: 2 university teachers were implicated with the program, as well as 2 school teachers.

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Evaluating student engagement with digital resources

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Abstract

Literature on student engagement that treats the phenomenon as a multi-dimensional construct tends by necessity to adopt a holistic approach to the subject. This paper draws on insights from this body of work into dimensions of engagement to present two small-scale case studies exploring particular patterns of student engagement with digital and on-line resources.

The first of these studies concerns the results of a questionnaire distributed to first and second year Music students (n = 73) to collect data about their experiences of, and perceived agency, with respect to online resources. The findings point to the benefits of educators constructing learning environments in which students can exercise learning autonomy. The second case study explores behavioural and cognitive engagement with blended learning resources within a particular learning design. Examination of data analytics and student interviews reveals a moderate correlation between student engagement with online resources and attainment, but also identifies areas for concern and future development.

1. Introduction

Student engagement has been described as 'the holy grail of learning' (Sinatra *et al.*, 2015, p.1); it has been demonstrated to be a major factor in the prediction of student retention and academic achievement (Appelton *et al.*, 2008) and motivation (Martin 2007). As multiple studies have shown, it is a complex phenomenon that has been modelled typically with two to four dimensions (e.g. behavioural, emotional, cognitive and agential engagements), and —when engagement as a whole rather than markers of its dimensions is the focus— approached holistically rather than through targeted studies (Fredericks *et al.*, 2004; Appleton *et al.*, 2008, Sinatra *et al.*, 2015). Nevertheless, approaching smaller-scale studies of student engagement through the lenses of the four dimensions provides ways of understanding more localised issues in teaching and learning as well as generating further evidence to support larger-scale studies. This paper, therefore, presents two studies that contribute to a growing body of work examining student engagement with digital resources within their learning.

2. Measuring agential engagement

2.1. Aims of study

The aims of this study, conducted with co-supervisor Emily Payne (University of Leeds), was, first, to understand student experiences of, and agential engagement with, online resources, and second, to consider the implications of this understanding for improving teaching practices and delivery.

2.2. Method

A questionnaire was distributed to students in levels 1 and 2 in the School of Music, University of Leeds, in May 2018. Quantitative data was collected about students' perceived levels of behavioural engagement with the resources (how often and how much they use the resources; how useful they perceive them to be for supporting their learning; which activities they support with online resources), using a likert scale where appropriate. Qualitative data was collected about students' experiences of agency when using online resources.

2.3. Selected results

Overall, student responses indicated a positive behavioural engagement with online resources. Moreover, there is evidence that such resources also have a beneficial impact on students' experiences of agency. When asked to rate 'To what extent do online resources encourage you to take responsibility for your learning?' on a 5-point Likert scale (1 = not at all; 5 = a lot), the average score was 4.26 (Level 1, 4.20; Level 2, 4.42). In response to the question 'To what extent do online resources help you achieve the level of independent learning appropriate for your year of study?', the scores were even higher: 4.37 overall (Level 1, 4.33; Level 2, 4.47). Building on this positive foundation, the recommendations below are designed to identify strengths and areas for development.

Qualitative comments concerning the positive impact of online resources on student behavioural engagement outnumbered those around negative impact (students were invited to give examples of each). Indicative positive comments pointed to greater agency in learning ('making me more engaged', 'allows me to engage further', 'I take more responsibility for research') although resources such as lecture capture have the potential to impact negatively on learning behaviour ('I don't always feel I have to engage', 'things […] can be overwhelming', 'less motivation').

2.4. Findings and implications

Students feel that online resources give them greater agency over their learning, with motivation for engaging with resources coming primarily from teaching staff, self-motivation and peers. The findings point to the need for teaching staff to ensure that virtual learning environments and associated media (if used) such as podcasts, online quizzes, lecture capture, etc., are clearly organised and their function made clear to students; staff should make it clear what the expectations are for online engagement as part of their modules, so that students understand clearly what is required of them.

3. Engagement and Learning Design

3.1. Aim of study and background

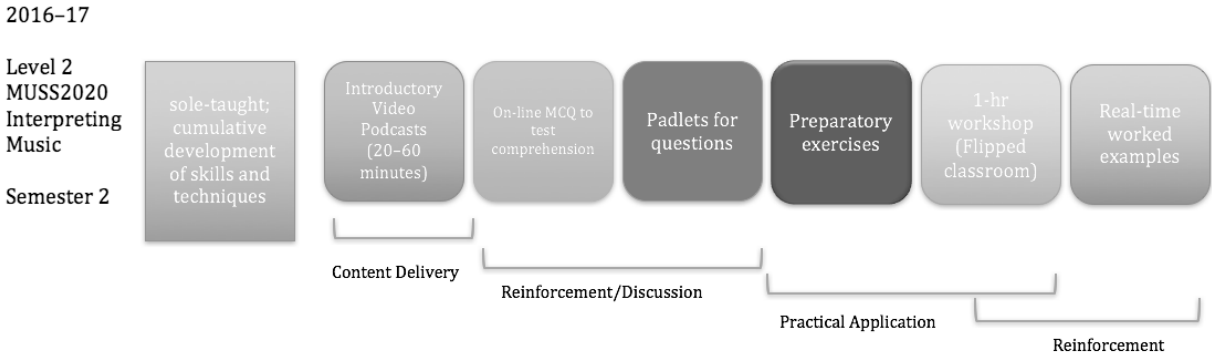
This study aimed to examine the relationship between teaching and learning design (with a focus on blended learning) and student engagement.

3.2. Context

The study centered on a second-year undergraduate music analysis module at the University of Leeds (MUSS2020 Interpreting Music). At the time of the study (2016-17), the module was compulsory for students on two of the degree programmes within the School of Music, and optional for the others, resulting in a mix of student motivation for taking the module. The teaching and learning strategy for the module had recently been revised to enable blended learning (podcasts, online MCQs, desktop capture of worked examples) and flipped classrooms in technology enhanced classrooms. Fig. 1 outlines the weekly pedagogical design.

Figure 1

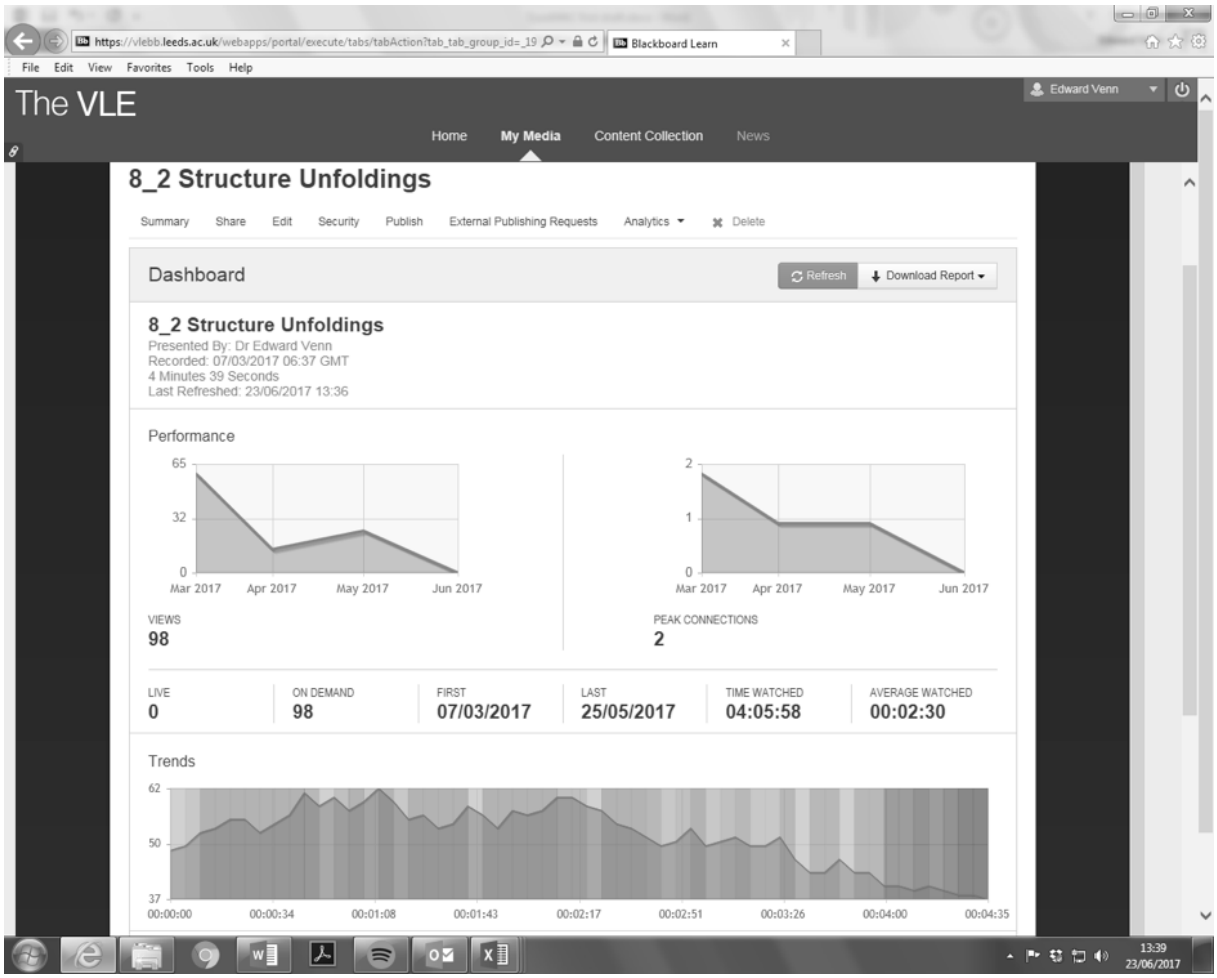
Weekly pedagogical design, MUSS2020



3.3. Method

61 students were enrolled on MUSS2020 in 2016-17. Data was gathered by means of learning analytics through the VLE, data relating to podcast viewing (number of individual views, details of which parts of podcasts students viewed, etc. – see Fig. 2), qualitative data from a module evaluation questionnaire conducted two weeks from the end of the module, and semi-structured interviews with students after a couple of weeks prior to the submission of the assessment.

Figure 2
Learning analytics relating to podcast viewing



3.4. Selected results

There exist moderate correlations between the final assessment grade attained by a student and their podcast viewing habits. The strongest correlation between grades and viewing habits concerns 'worked examples', both pre- and post-workshops. Students who engaged with all of this material tended to perform better than those that did not: the correlation between grade and viewing habits for students who engaged with all podcasts was 0.59, versus a coefficient of 0.5 between final grades and viewing of pre-workshop, non-worked examples alone. In either case, the correlation remains only moderate, indicating that other factors influenced performance (including, perhaps, the groupwork in the collaborative lecture spaces and the opportunity to discuss ideas on the padlet). Nevertheless, in comparison with previous delivery of the module, there was a clear shift in patterns of behaviour: the pedagogical design adopted in 2016-17 seems to have encouraged a more active engagement with resources, and with a corresponding impact on overall performance.

Qualitative data from interviews reinforced the impression of positive changes to behavioural engagement gleaned from learning analytics; in addition, greater cognitive

engagement (in the form of active reflection on learning) can be discerned. Representative comments include:

> 'I wasn't just going to [analysis] lectures to wait to find out was going to happen – I had to be aware of [content] beforehand. … Off the back of that it affected other modules – once I got in that mindset of having to sit down [and prepare for lectures] for 1.5, 2 hours then I was in the right mindset for other modules'.
>
> 'I think that one of the biggest factors in how [technologically enhanced classrooms] affected how I think critically is the *interaction* with other students. In a group … you have to take everyone's work into account and *evaluate* which aspects are the ones you wanted to show [to the rest of the class], which ones we thought, compared to our own, were more "correct".'

3.5. Findings and Implications

The data from this study show a moderate correlation between engagement and achievement, complimenting similar studies in this area. Nevertheless, student engagement with digital resources relates to perceived integration into coherent learning design; consideration of the latter must be given in order to meet the potential for digital resources to enhance behavioural and cognitive engagement.

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Promoting Engineering Students Engagement in Overcoming their Mathematical Shortages by Using LagunOn Virtual Assistant

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Abstract

In this work the students' engagement in utilizing self-learning virtual tools is evaluated from the results obtained after carrying out a didactic experience with first-year engineering undergraduates with the aim of helping them to overcome the lack of mathematical knowledge that they had at the initial stage of their higher education studies.

1. Introduction

In the last years, there has been a great diversification of the knowledge that the students have when starting the academic programs offered at the Faculty of Engineering of Bilbao of the University of the Basque Country, specially due to their different education profiles (high school graduates, professional training students, learners older than 25 years,...) and to the different teaching levels of the centres where they come from [1]. Such diversity means that their mastery about the fundamental concepts that are essential prior to facing the new subjects is quite heterogeneous, particularly when these belong to the basic academic modules. Due to this, it is very advisable to perform new actions that, besides helping to internalise the required skills, allow the students to determine their readiness level [2]. Since the number of students is usually high and the face-to-face teaching time is limited, those activities should be designed to be autonomously undertaken without the instructor's supervision. However, this demands higher involvement levels from the students' side [3]. In this regard, the authors of this paper defined a set of activities based on the utilization of multimedia contents provided by means of a virtual platform, so that the students of the Management Computer Engineering and Information Systems Degree of the aforementioned faculty could detect and overcome the mathematical shortages that they presented at the beginning of their first academic year. The results obtained from the application were very helpful to identify not only this type of shortages, but also the students' leveraging of the available resources and their motivation for outperforming themselves, which is a key indicator that should be taken into account when designing experiences focused on stimulating their participation [4].

2. Educational Actions and Tools: Lagunon Virtual Assistant

The teaching tools designed for this project were integrated into what the authors of this paper called the LagunOn Virtual Assistant. More specifically, two tests were defined as a fundamental part of these tools. The first one (Test A) was a questionnaire conceived to know the students' university admission marks, as well as their own perception of the

mathematical knowledge that they had at the time of filling it out. The second one (Test B) was an exam that allowed quantifying objectively their mathematical abilities. Also, different multimedia contents were developed and provided to the students, in order to encourage their autonomy for overcoming the corresponding mathematical shortages identified from the results of this second test. To this end, both multimedia and Test B contents were classified following an identical framework consisting of 10 independent modules related to different concepts that have to be learnt before attending the "Linear Algebra" (modules A1 to A5) and "Calculus" (modules C1 to C5) subjects, taught during the first year of the before mentioned engineering degree.

All the students answered the tests during the first master class of the course, so that the results of Test B were notified in less than a week, with the aim of making them aware as soon as possible of the real mathematical knowledge that they had.

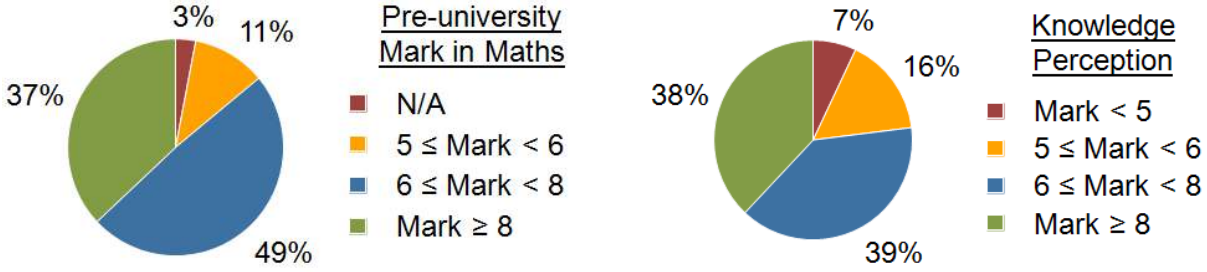
Finally, after recommending them to work on all the modules in which their mark was lower than 6.7 out of 10, the usage made by the students of the LagunOn Virtual Assistant contents was tracked so as to obtain the results provided in Section IV, regarding their engagement level.

3. Analysis of Relationship Between the Students Profile and their Knowledge Level

From the answers given in Test A, it was determined that 93% of the 84 students that took part in this educational experience were high school graduates, while the remaining 7% got another equivalent degree. With this in mind, they were classified according to two indicators: the final mark obtained in mathematics during their pre-university studies and the students' perception about the knowledge that they had in this area. As a result, the percentages included in Figure 1 were obtained.

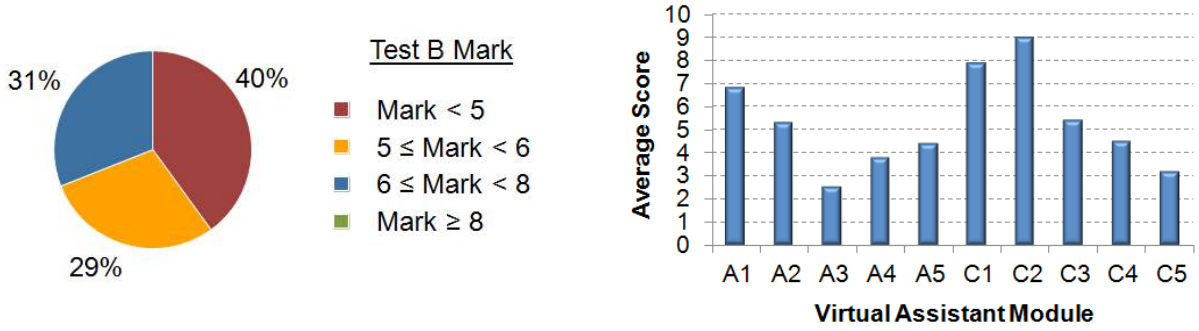
Figure 1

Students classification according to their mark and perception of knowledge in maths



The previous results, as well as a detailed analysis of the corresponding indicators, led to conclude that there is a direct relationship between the value that the students gave to the their own knowledge in maths and the mark previously obtained in this subject. In fact, the difference between them was equal or lower than 1 in more than 60% of the cases. Nevertheless, it has to be emphasized that these two aspects are not directly linked to the importance of mathematics according to the students' opinion, since the average value that they gave to their relevance in engineering was 8.7 out of 10.

Figure 2
Students classification according to the Test B: global mark and average scores obtained for each one of the virtual assistant modules



The results of Test B were also processed and depicted as shown in Figure 2. The comparison of those results with the ones of Figure 1 reveals that the Test B global marks are significantly lower than those corresponding to the pre-university period, and thus, to the values that describe the students' perception of the their knowledge in maths. Specifically, the average difference between both marks is 1.9 points, concluding that there is a qualitative gap between the knowledge level acquired in mathematics before starting the first year of the engineering degree selected for this study and the one required to undertake it with a certain guarantee of success. Even more, the right graph of Figure 2 states that such gap is more significant in the case of Algebra, since the average marks obtained in the modules A1 to A5 of Test B was only 4.5, that is, 1.5 points lower than the one corresponding to the modules C1 to C5.

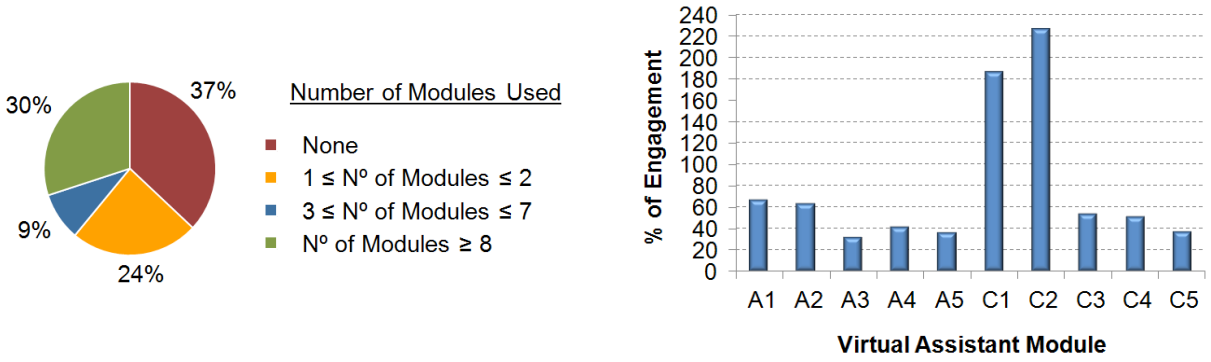
4. Evaluation of the Students Engagement in the Use of Virtual Self-Learning Tools

As mentioned in Section 2, the usage made by the students of the LagunOn Virtual Assistant contents was registered with the aim of determining their level of engagement in taking advantage of this type of tools. The level of engagement has been calculated as the ratio of the students that utilized a specific module divided by those that should have used it because their mark in that module was lower than 6.7 out of 10.

According to the data of the left graph of Figure 3, 63% of the students worked through one or more modules of the virtual assistant so as to improve their mathematical knowledge, and indeed, 30% used 8 or more modules, which is a very encouraging outcome. Also, the values of the bar graph included in the same figure point out that the students' engagement level in the use of the multimedia contents developed for this study was higher than 50% for 6 of the 10 modules, and even higher than 180% in the case of the C1 and C2 modules. Such high percentages obtained in these two last cases are due to the fact that it was required to know several concepts described in those modules to understand the "Calculus" subject that the students were attending at the time of performing the educational experience here described.

Figure 3

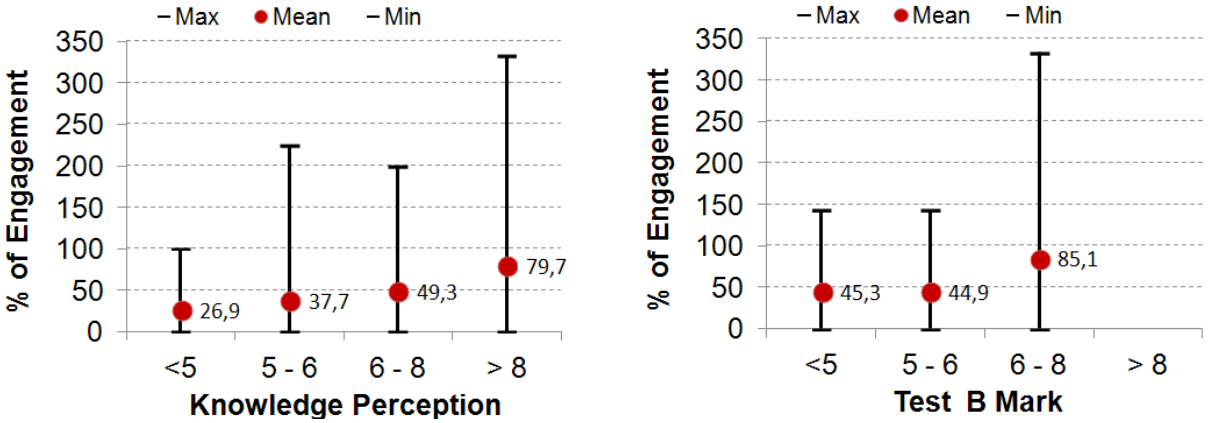
Students classification according to their usage of the virtual assistant modules and percentages of engagement in taking advantage of those modules



To finish, Figure 4 shows the students' engagement level according to two of the indicators already considered in Section 3: their perception of their own mathematical knowledge and the Test B global mark. In both cases, it is observed a similar trend indicating that the higher knowledge, or the perception of it, the greater the engagement. This seems logical, because the comprehension of new concepts, techniques or ideas in a specific area increases with the grade of expertise in that area, which favours significantly the autonomy and stimulus to continue studying. On the contrary, a low level of knowledge or a perception that such knowledge is not enough, will prompt a lack of motivation to utilize self-learning tools, because the effort that has to be done in that case is greater than the one required when there is a mentor that teaches in a guided way.

Figure 4

Percentages of engagement in using the LagunOn Virtual Assistant determined according to the students perception of their own mathematical knowledge and the Test B global mark



5. Conclusions

An analysis related to the university students' engagement in the use of self-learning tools conceived for assisting them in overcoming the lack of knowledge with which they tackle the subjects of their first academic year is detailed in this paper. To do this, it was performed an educational experience that consisted on carrying out a set of actions based on the utilization of different multimedia contents that were integrated in a virtual assistant specifically designed to this end. The results obtained from the tracking of its use show that the students who take more advantage of this type of assistants are those with higher knowledge, or perception of it, in the area chosen for their implementation, reaching an average engagement of up to 80% or 85% if the contents are directly related to the lectures that they are attending.

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Ikasgelak iraultzen: ikasleriaren inplikazioa indartzea "Socrative" aplikazioaren bitartez enpresa ikasketetan

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Laburpena

Lan honetan, 2018-2019 ikasturtean Euskal Herriko Unibertsitateko Donostiako Ekonomia eta Enpresa Fakultatean (Gipuzkoako atala) egindako esperientzia bat jasotzen da. Saiakuntzaren helburu nagusia ikasleriak ikaskuntza-irakaskuntzarako metodologia aktiboen inguruan duen hautematea jasotzea zen; zehazki, ikasleen mugikorra baliatzen duen tresna erabilita motibazioa, inplikazioa eta beste zenbait iritzi neurtzea lortu nahi zen. Horretarako, Socrative tresna erabili zen online erako galdetegi batzuei erantzuteko, ikasleriaren motibazioa eta parte-hartzea indartzeko asmoarekin, eta ikasgela irauliaren metodologiaren testuinguruan.

Abstract

This paper describes an experience carried out in the 2018-2019 academic year at the Faculty of Economics and Business of the University of the Basque Country (Gipuzkoa section). The main objective of the essay was to collect the student's perceived perceptions of the active teaching-learning methodologies; specifically aimed at motivating, involving and other opinions using the mobile student's tool. To this end, the Socrative tool was used to answer some questionnaires online, with the aim of strengthening the student's motivation and participation, in the context of flipped classroom.

1. Sarrera

Irakaskuntzan zentratutako hezkuntza-eredu batetik ikaskuntzan zentratutako eredu batera pasatzeak kultura-aldaketa handia eskatzen dio unibertsitateari. Iraultza honen ardatzetako bat berrikuntza metodologikoa da. Era honetan, hezkuntza-metodologien erreforma ezinbesteko prozesua da Espainiako unibertsitateek ezinbestekoa duten hezkuntza-eskaintzaren eguneratzea egiteko (Crue, 2006). Hezkuntza-sistemaren eraldaketa hau bi indar handiren aurrean garatutako erantzuna da: mundu global bati egokitzeko beharra eta ezagutzaren gizartea (Fernández March, 2006).

Euskal Herriko Unibertsitateari (UPV/EHU) dagokionez, azken urteotan irakaskuntza -metodologia berrietan trebatzeko programak sustatu ditu Goi-mailako Hezkuntzen Europako Esparruaren (GHEE) eskakizunetara egokitzeko asmoz (UPV/EHU, 2019). Eredu berria ikasleengan oinarritua dago, Ikaskuntza Kooperatiboa eta Dinamikoa (IKD) ereduaren barnean. Eredu honen arabera, ardatza ikaskuntza-prozesua da, metodologia aktiboen bitartez eta informazioaren eta komunikazioaren teknologien laguntzarekin ikasleriaren profil egoki bat lortzeko helburuarekin: ikaskuntza gaitasun aktiboa, autonomoa, estrategikoa, gogoetatsua, kooperatiboa eta arduratsua duena (Fernández March, 2006; UPV/EHU, 2019).

2. Metodologia teoria eta tresnak

2.1. *Flipped classroom* edo ikasgela iraulia

Honen guztiaren ondorioz, ikaskuntza-prozesuan gero eta garrantzi handiagoa dauka ikasleak egiten duenak, eta ez hainbeste irakasleak egiten duenak. Honetarako, ikaskuntza-metodologia aktiboak garatu eta lantzea ezinbestekoa da eta, horrekin lotuta, ikasgelako denbora okupatzeko era desberdinak. Ikasgela iraulia (*flipped classroom*) metodologia hauetako bat da.

Ikasgela irauliaren ikuspegian, eskolak ikaskuntza kolektiboaren espazioetatik ateratzen dira, ikasleen behar indibidualei lekua egiteko, konpromiso handiagoa lortzeko eta ikaskuntza aktiboa indartzeko, edukiak sakrifikatu gabe. Horrela, irakasleak denbora gehiago erabil dezake ezagutzaren aplikazioan eta integrazioan ikaskuntza estrategien bitartez, ikasgelako interakzioa erabilita, ikasleen ulertze-maila ziurtatu eta edukiak indartzeko; beste era batera esanda, maila altuko zeregin kognitiboak (arazoak ebatztea, kasuak aztertzea edo proiektuak garatzea) ikasgelan lantzen dira, eta maila baxukoak (irakurtzea, entzutea, ikustea), ordea, ikasgelaz kanpo ebazten dira (Fadini eta Finardi, 2015; Marqués, 2016).

Era honetan, ikasleen autonomia garatzea bilatzen da, ikasleak euren ikaskuntzaren kudeatzaile aktibo bilakatzen direlako, instrukzio-hartzaile soilak izan beharrean. Ikasleek euren ikaskuntza kontrolatu dezakete, prozesuan gehiago inplikatzen direlarik, euren autonomia indartuz. Honek aldaketa sakona suposatzen du, bai ikasle eta bai irakasleentzat ere, euren konfort-zonatik atera behar baitira irakatsi eta ikasteko beste era bat lantzeko. Metodologia aldatzeko prest dagoen irakasleriak zalantzak eta urduritasunak izan ditzake, eta estrategia zein tresna berriak ikasi eta barneratu behar dituzte baliabide gehiago izateko.

2.2. 2.0 Webinguruneak ikaskuntza-irakaskuntzarako ikasgela irauliaren ingurunean: Socrative tresna (www.socrative.com)

Socrative interfazeak (eta mugikor aplikazioak) irakasleei ikaskuntza-prozesua ebaluatzeko tresna bat errazten die tablet, smartphone zein mugikorren bitartez. Momentuan egindako galderen bitartez, eta emaitzak unean bistaratzeko aukeraren bitartez, irakasleak ikasgelaren ulertze-maila baloratu dezake, eta ikasleen beharrak identifikatu.

Irakasleak kontu bat ireki behar du, eta gela bat sortu. Ikasleek aplikazioa jaitsi dezakete edo web orrialde bidez konektatu eta gela birtualean sartu kode baten bitartez, euren dispositiboak erabiliz (telefono mugikorra da aukerarik errazena).

Aukera ugari ditu, adibidez, momentuan kalifikatu, emaitzei buruzko grafikoak osatu eta erakutsi, era desberdinetako galderak proposatuz. Lehiaketak, jokoak etab. ere eskaintzen ditu Socrativek. Era honetan, ikaslearen eta irakaslearen arteko etengabeko atzeraelikadura indartzen da, *Just in Time Teaching* deritzon planteamenduarekin (Novak *et al.*, 1999).

3. Egindako esperientzia eta metodoak

Aztergai dugun esperientzia 2018ko urritik eta abendura bitartean burutu zen Euskal Herriko Unibertsitateko Donostiako Ekonomia eta Enpresa Fakultatean (Gipuzkoako atala). Saiakuntzaren helburu nagusia ikasleriak ikaskuntza-irakaskuntzarako metodologia aktiboen inguruan duen hautematea jasotzea zen; zehazki, ikasleen mugikorra baliatzen duen tresna erabilita motibazioa, inplikazioa eta beste zenbait iritzi neurtzea lortu nahi zen.

Socrative tresna erabili zen online erako galdetegi batzuei erantzuteko. Galdetegian, adibidez, ikasleei ikasitakori buruz azalpen gehigarri bat behar zuten galdetu zitzaien, beharrezkoa izan balitz zenbait eduki sakontzeko. Metodologia honen helburuak hobeto ikastea, motibazioa areagotzea, parte-hartzea sustatzea eta ikasleen beharretara egokitzea dira.

Esperientzia bi ikasgai desberdinetako zortzi taldetan aplikatu zen, ikasturte eta hizkuntza desberdinetan, 1. taulan ikus daitekeen moduan.

1. taula
Saiakuntzari buruzko informazio orokorra

Datak	Irakasgaiak eta ikasturteak	Hizkuntzak	Irakasleria eta taldeak
2018ko urritik abendura	Enpresa Ekonomiarako Sarrera (1. maila) Zuzendaritza Estrategikoa: Enpresa Politika (3. maila)	Euskara eta Gaztelania	5 irakasle 8 taldetan

Aktibitatea irakasgai-hizkuntzako talde bakoitzean gai desberdinetan erabili zen. Gainera, lehenengo eta hirugarren mailan desberdin aplikatu zen. Hirugarren mailako ikasleen kasuan, Socrative tresna zehatza *flipped classroom* metodologia orokorragoaren barnean kokatu zen. Hau da, lehenik eta behin, aurretik azaldu bezala, ikasleriak zenbait eduki bere kabuz landu zuen, eta ondoren mugikorren bidezko tresna zehatza landu zen testuinguru horretan. Lehenengo mailako ikasleen kasuan, ordea, taldeen eta irakasgaien egitura dela eta, metodologia aktiboak erabili ziren irakasgaiotan, baina *flipped classroom*-a landu gabe.

Ondoren, saiakuntzan parte hartu zuten ikasleei galdetegi bana banatu zitzaien, euren iritzia adieraz zezaten. Galdetegia 4 bloketan banatua zegoen: Socrative tresnari buruzko balorazioa, tresnaren erabileraren egokitasuna ikaskuntza-prozesuan, *flipped classroom* metodologiaren balorazioa (3. mailan soilik) eta identifikazio datuak (adina, ikasturtea, ikasgaian itxarondako kalifikazioa, sexua eta irakasgaia). Bloke bakoitzak baieztapen desberdin batzuk osatu zituen, 5 puntuko Likert eskala baten bitartez. Lortutako inkesta kopurua 2. taulan ikus daiteke.

2. taula
Lortutako lagina

Irakasgaiak eta ikasturteak	Ikasturtea	Hizkuntza	Flipped classroom metodologia	Betetako inkesta kopurua
Enpresa Ekonomiarako Sarrera	1	Gaztelania	Ez	32
Enpresa Ekonomiarako Sarrera	1	Euskara	Ez	50
Zuzendaritza Estrategikoa: Enpresa Politika	3	Gaztelania	Bai	17
Zuzendaritza Estrategikoa: Enpresa Politika	3	Euskara	Bai	53
				Guztira: 152

4. Emaitzak eta eztabaida

4.1. Emaitzak

Esan bezala, 152 inkesta bildu ziren bloke desberdinei buruzko informazioa jasotzeko. 3. taulan lortutako emaitza deskriptiboak ikus daitezke. Informazioa argiago ikusteko asmoz, 1-2 balorazioko erantzunak («guztiz ez ados», eta «ez ados>), eta 4-5 erantzunak («guztiz ados» eta «ados») elkartu egin dira.

3. taula
Emaitza deskriptiboak

Aldagaia	1-2 Ez ados	3 Erdikoa	4-5 Ados
Socrative tresnaren balorazioa		%	
Erabilgarria da ikaskuntzarako	3,9	22,4	73,7
Ikaskuntza-zailtasunak identifikatzeko lagungarria	5,9	36,2	57,9
Ikaskuntza-helburuak lortzen laguntzen du.	7,2	29,6	63,2
Socrative tresnaren erabilgarritasuna		%	
Tresna erabilgarria orokorrean	3,3	13,8	82,9
Kalifikatzeko balio duen tresna	23,0	43,4	33,6
Ikasgai gehiagotan erabili beharko litzatekeen tresna	1,3	26,5	72,2
Fliped classroom-ari buruzko balorazioa		%	
Metodologia interesgarria ikaskuntzarako	8,7	34,8	56,5
Ezagutzak hobeto barneratzen laguntzen du	11,6	29,0	59,4
Irakasgaiarekiko interesa areagotzen du	16,7	25,0	58,3
Maizago erabili beharko litzateke irakasgaian	7,3	39,1	53,6
Ikasgaiko edukiaren zein ehuneko landu metodologia honekin	0-20 %16,7	21-40 %36,7	41-60 %30 / 61-80 %13,3 / 81-100 %3,3
Identifikazio datuak			
Maila	1: %54	3: %46	
Esperotako kalifikazioa	Nahikoa %15,3	Oso ongi %48,7	Bikain/OM %36
Sexua	Em: %45,6	Giz: %54,4	

Taulak erakusten duen moduan, orokorrean, bai Socrative tresnaren inguruko balorazioak, eta bai *flipped classroom* metodologiaren ingurukoak ere nahiko positiboak dira. Bereziki, Socrative tresnaren inguruko iritziak oso onak dira, bai balorazio orokorrari dagokionez, baita bere erabilgarritasunari buruz ere. Duda bakarra «kalifikatzeko tresna modura erabiliko luketen» galderaren ingurukoa da. Bertan ikus daiteke ikasle gehienek ez dutela argi ikusten tresna honek ikasgaia kalifikatzeko balio dezakeenik.

Flipped classroom metodologiari buruz, ordea, emaitzak, onak diren arren, ez dira hain argi positiboki baloratzen. Beharbada, metodologiari buruzko nondik norakoak ez dira behar bezain beste landu eta azaldu, eta, horregatik, 5 puntuko eskalan tarteko aukera erantzun dutenak % 25 eta % 40 artean dira.

Ikasle gehienek, dena den, balorazio positiboa ematen diote metodologia honi, eta bi herenen ustez ikasgaiaren edukiaren zati garrantzitsu bat (% 21 eta % 60 artean) lantzeko baliagarria eta desiragarria da.

4.2. Eztabaida

Lortutako emaitzek argi uzten dute orokorrean ikasleen hautematea positiboa dela metodologia eta tresna hauekiko. Literaturan topa daitezkeen lan gehienek antzeko emaitzak erakusten dituzte. Adibidez, Wash-en (2014) lanak balorazio bereziki positiboak topatzen ditu klaseko parte-hartzearekiko, jasotako berrelikadurarekiko eta erronka mentalarekiko, eta, maila baxuago batean, ikasgelako interakzioak errazteko gaitasunarekiko eta ikaskuntzaren hobekuntzarekiko. Ildo honetan, Dakka-ren (2015) ikerketa batek Socrativeren erabilerak emaitzak nabarmen hobetzen zituela adierazten du.

Maila desberdinetan, baina, azken urteetan egindako ikerketa guztiek antzeko emaitzak topatzen dituzte; kasu gehienetan oso positiboak, aipatutako aldagai guztiekiko (Méndez Coca eta Slisko, 2013; Dervan, 2014; Awedh *et al.*, 2015).

5. Ondorioak

Socrative bezalako ikasleen erantzun-sistemek (SRS ingelesez) ikasgelan ikaskuntza aktiborako giroa sortzeko eta indartzeko gaitasuna daukate. Tresna honek ikasleen ikaskuntza-prozesuaren bilakaera momentuan jarraitzeko aukera eskaintzen du. Gainera, irakasleak edo zentroak ez du azpiegiturarik eskaini behar, ikasle bakoitzak berea erabiltzen duelako; are gehiago, ikasleentzat gero eta gehiago eguneroko tresna den telefono mugikorra erabiltzen du, ikaskuntza-prozesua eurentzat ezaguna eta erosoa den ingurune batera mugituz.

Orokorrean, ikasgela irauliak XXI. mendeko ikaskuntza-beharretara egokitzeko balio du, GHEEk ezartzen dituen printzipioekin bateratuz. Metodologia oso baliagarria da banakakoaren bilakaera kontrolatzeko eta indartzeko eta baita ezagutza-sormena, elkarlana eta tresna digitalen menperatzea indartzeko ere.

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Teaching Activism, Ecological Justice and Sustainable Development: Pedagogical Endeavours in Professional Social Work Education

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Abstract

'Environmental degradation is a pressing, global problem and is concentrated in oppressed populations and oppressed geographical regions. This matters to our [social work] clients. The human impacts of environmental challenges fall most heavily on those whom social workers are most accountable' (Teixeira & Krings, 2015, p. 524). This powerful statement resonates with the humanistic and emancipatory values of social work with roots in social justice (Howe, 2009). However, it is this very emphasis on social justice, with its anthropocentric focus to the exclusion of the rest of the planet, which social work needs to address if the profession is going to play their part in helping service users' deal with the worst impacts of climate change. Environmental justice, green social work and ecological justice are largely absent from the social work education curriculum in Ireland. As social work educators, we believe the role of social work education demands a pedagogical commitment to develop social responsibility and awareness amongst our students. From our own experiences of being involved in social action in Ireland in LGBT+ rights and environmental campaigns we learned the power of groups coming together to develop critical consciousness (Friere, 2000/2014) to influence social change. This paper outlines our pedagogical endeavours in grappling with how best to teach activism in an already full, demanding professional social work programme. We discuss our piloted workshop with a cohort of first year postgraduate social work students. We outline our approach in creating a discursive and exploratory learning space, where students were invited to discuss the external and internal barriers to, and benefits of social work activism. Finally this paper presents survey findings about students' experiences of activism, which we carried out following the workshop. The results showed that less than half the students were involved in any form of social action and of those that were none were involved with the environment, climate change and sustainable development goals. We conclude that there is a basic gap in social work students' critical awareness of globalisation and its impacts on social work at local and international levels. This deficit needs to be addressed as part our commitment to integrating social responsibility in our teaching.

1. Introduction

The World Health Organisation (2018, np) state that 'between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress'. The United Nations Human Rights Council identified women, children, indigenous communities, older adults and persons with disabilities in developing countries as particularly vulnerable to adverse impacts of climate change. The impacts of climate change have real impacts for service-users of social workers across the globe, which provides an impetus for it to be a component of social work education. This paper documents the experiences and pedagogical efforts of co-creating knowledge and learning with postgraduate social work students about activism, ecological social justice and the environment. Firstly, it addresses our pedagogical value-base in relation to social work and the environment. Secondly, it discuses how we have grappled with curricular approaches to teaching activism and environmental social work within an already

packed professionally-accredited academic program. Thirdly, we discuss our methods and results from our pedagogical journey so far. We outline our novel approach to teaching, which was an exploratory, collaborative learning and teaching space to build knowledge about activism in social work.

2. Social Work Activism And Agitation – Our Pedagogical Positioning

The accepted definition of social work places a strong emphasis on social action, social justice, empowerment, human rights and solidarity:

> "Social work is a practice-based profession and an academic discipline that promotes social change and development, social cohesion, and the empowerment and liberation of people. Principles of social justice, human rights, collective responsibility and respect for diversities are central to social work. Underpinned by theories of social work, social sciences, humanities and indigenous knowledge, social work engages people and structures to address life challenges and enhance wellbeing." (IFSW, IASW, 2019)

From our own experiences of involvement in social action in Ireland in LGBT+ rights and environmental campaigns, we developed a deep understanding of the power of groups coming together to develop 'critical consciousness' (Friere, 2000/2014) to influence social change. These experiences have shaped us as individuals, practitoners and educators . Clement Atlee (1920, p. 237), argued that, 'Every social worker is almost certain to be also an agitator'. In response to a growing awarenesss of the need to engage students about the impact of the climate change, which is the most pressing existential issue facing humanity, we sought to make explicit the connections between core social work values and theories, ecological justice and the 'real-world' implications of climate change for social work service-users. As social work educators, we want to foster agitation among future social work practitioners about the centrality of the environment in the social work mission. In doing so, we wish to challenge the embedded nature of neo-liberal mechanisms in social work education and practice by providing an alternative vision of social work which authentically coheres with social work's ethical commitment to social justice. Reisch (2013, cited in Jones *et al.,* 2017) captures our vision of social work education:

A shift towards a global way of thinking can help propel social work education beyond the relatively narrow focus programs have adopted in response to dominant neo-liberal forces that tend to privilege professionalisation, market-based solutions, individual concerns, and clinically-oriented work (p. 2).

3. Methods

We were inspired by the work of Samantha Wehbi and Silvia Straka (2011) who have engaged in participatory, reflective social work education. They argue that, 'a very important goal of an anti-oppressive social work educator is to help students "catch" a social justice vision to motivate their practice' (Wehbi and Straka, 2011, p. 46). We developed a pilot workshop for first year postgraduate social work students in a short third term

which takes place in April/May each year, following their first academic term and work-based practice placement. At the outset of the class, we shared some of our own experiences of engaging in activism. The workshop was both discursive and reflective. In keeping with Wehbi and Straka's (2011) argument that the 'living classroom' should become a site where social justice is brought to life, we came to the learning space as co-learners with our students. We rejected the traditional 'banking method of teaching' (Feire, 2000/2014), and consciously chose to engage in 'dialogic action' with our students in the co-construction of knowledge and understanding about the place of social activism, social justice and ecological justice in social work education and practice. Rather than see ourselves as the instructional experts in the classroom, we invited students to define and discuss external and internal barriers to, and benefits of, social work activism. Students worked in small groups (three to four) and shared their perspectives with each other initially and then with the wider class. We employed group work strategies in order to ensure that all voices were included and welcomed in this collaborative learning-hub. At the end of the class, we surveyed the students about:

— their understanding of activism;
— their participation in activism (benefits and challenges);
— their views about the inclusion of activism, social justice and sustainability in the social work curriculum.

This method of data collection became another entry point to our co-learning process, giving students the opportunity to further expand on their ideas, thoughts, views and perspectives on the topic. Participation in the survey was completely anonymous and voluntary. Students were clearly advised that their participation was voluntary and their decision to participate did not form any part of their assessment and progression on their MSW. We provided a detailed information sheet and students completed an informed consent form. A colleague from our School distributed and anonymized the surveys on our behalf in order to maintain students' anonymity. We received full ethical approval for this open-ended questionnaire from our University's Social Research Ethics Committee in advance of the workshop. A total of 24 surveys were analyzed by text analysis using discourse analysis, which focused on the meaning of language, text and conversation as they are used and appear in everyday use:

Language is studied as it appears in social tests, that is wherever it appears as a social product, in written or spoken form (Sarantakos, 2005, p. 309).

4. Results

4.1. Students' Perceptions of Activism

Students identified a broad range of methods for social activism, which ranged from more passive forms of engagement such as sharing articles/opinions on social media platforms, to more active and direct forms of agitation e.g. joining a group, going on protest march and even taking direct action (as detailed in Table 1).

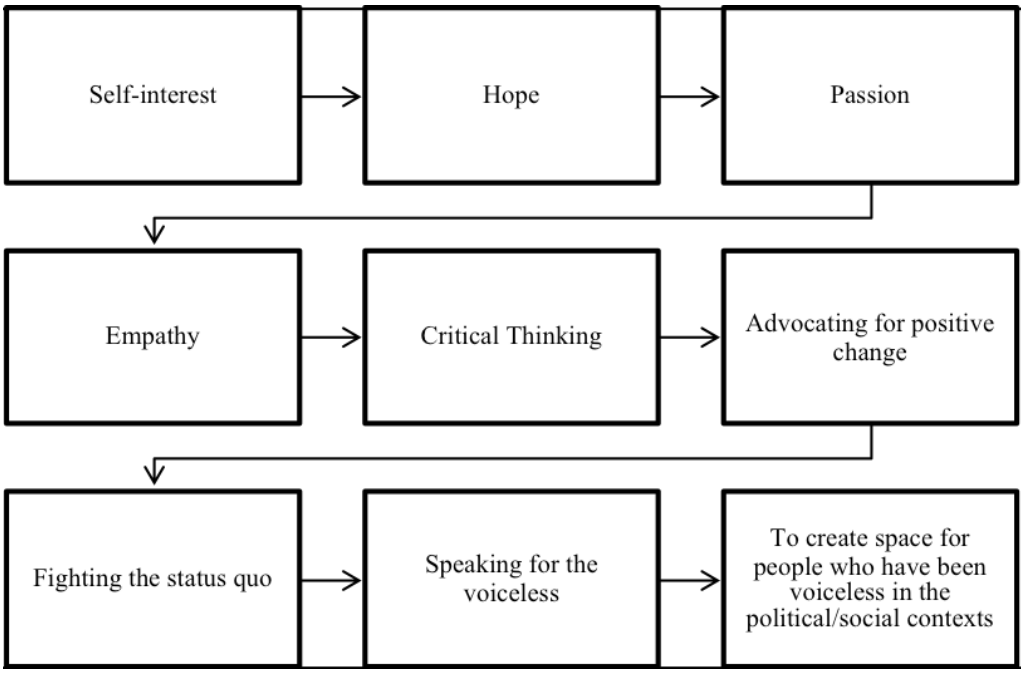
Table 1

Types of Activism	Passive	Sharing on social media
		Donating
		Fundraising
		Presentations/Education to inform others
		Doing research
		Signing a petition
		Voting
		Writing Letters
		Joining a union
		Joining together as a group to promoting social change
		Lobbying
		Going to a public meeting
		Going on a march
	Active	Protesting/Direct Action

4.2. Students' views for engaging in social activism

The student' views about the reasons for activism in social work varied from their own personal micro-level self-interest up to macro-level reasons, which focused responding to structural oppression (as detailed in Fig.1):

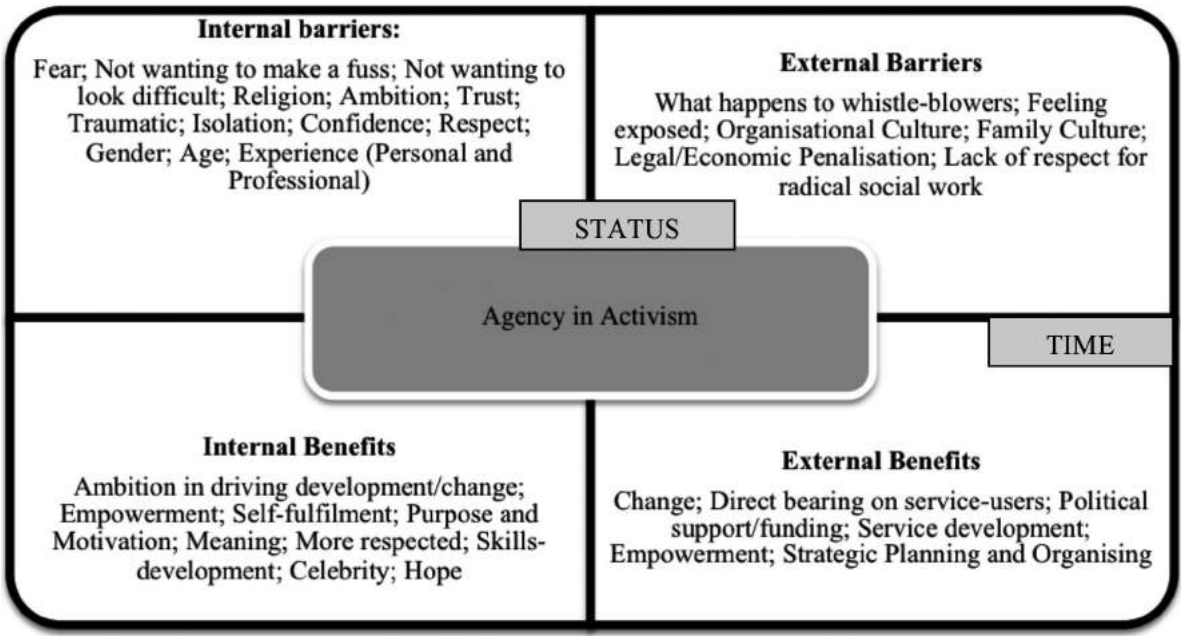
Figure 1



4.3. Social Work Activism: Benefits and Barriers

In the workshop and the survey, students identified some of the following as internal benefits of engaging in activism: driving social change, self-fulfilment, meaning, feel respected, hope and even attain celebrity status. External benefits identified by students were personal empowerment, enabling strategic planning and organising for service development, which has a direct, positive bearing on service-users. On the other hand, students also identified internal and external barriers to social work activism. Some of the internal barriers were personal (fear, lack of confidence, and not wanting to look difficult), while others were more inter-personal factors (trust, isolation). Other internal barriers were concerns for professional development, where activism was perceived to be harmful to profession progression and ambition. Students identified a number of external barriers to activism-involvement, many of which related to legal and economic penalisation, organisational culture and a sense of personal vulnerability around whistle-blowing. The findings are detailed in Fig 2. Below. When the benefits and barriers are considered together, the findings suggest that both status and time play pivotal roles in students' interest, involvement and pursuit of activism.

Figure 2



4.4. Student Social Work Engagement in Activism

Wehbi and Straka (2011,p.46) state that 'most students come into social work education motivated by a desire to "help people". The findings from our participants indicate that almost 60% of students are not oriented towards activism (see. Fig.3 and Table 2 below). These findings confirm our views that we need to develop the capacity for social work educators to employ innovative pedagogical approaches to learning and teaching activism. This is particularly urgent given the low level of engagement with even passive forms of activism, such as sharing articles on social media.

Figure 3

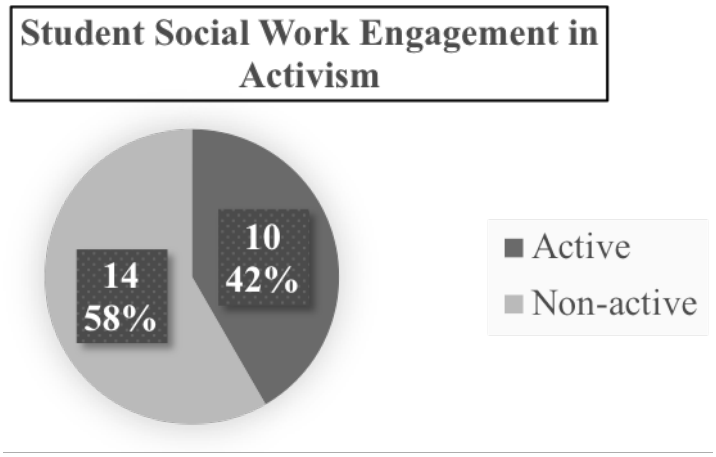


Table 2

	Type	Number
Types of Activism by Social Work Students	Political Membership/Activism	4
	Marches and Campaigning	3
	Fundraising	2
	Community Development	2
	Writing and Sharing Articles on Social Media	2
	Advocacy against Building Developments	1

5. Reflection and Conclusion

The environment, climate change, sustainability and ecological justice were not identified as a form of social work activism and did not feature anywhere in the students' survey responses. While concerning, it was not necessarily surprising to us given that environmental justice, green social work and ecological justice are largely absent from the social work curriculum in Ireland. As social work educators with a deep concern for the living planet, we believe the role of social work education demands a pedagogical commitment to develop social responsibility and awareness of humanity's inextricable links to nature/environment in our students. We agree with Dominelli's (2011) argument that:

> Climate change debates can benefit from social workers' involvement. They have important roles to play in reducing carbon emissions, promoting clean energy consumption and protecting vulnerable populations from the deleterious impact of climate change by enhancing individual and community resilience and helping residents access green technologies (p. 437).

There is an urgency for us in the Irish context because Ireland ranked the worst country on climate action in the European Union – Climate Change Performance Index 2019.

Lane *et al.* (2017, p. 361) state that 'social work's unique pedagogical contributions come from a fundamental belief that the environment influences every aspect of human life'. Despite social work education being infused with the language of Ecological Systems Theory (Bronfenbrenner, 1979), its focus to date has been anthropocentric, emphasising social ecology. In other words, when the social work profession talks about taking an ecological perspective, the environment is discussed only in the context of how we as humans use and benefit from it, i.e. the environment is in service to us. We tend to view our ecological systems as a system of our human interaction as if we only interact with humans in our daily lives, that we live separately to the ecologies around us. In doing so, the profession perpetuates consumerist hegemony which conceptualizes humans as benign consumers of the environment. Social work's recognition of the multi-systemic nature of social problems makes us unique among helping professions. Although we are leaders in the use of the ecological systems perspective to intervene across multiple systems levels, we remain focused largely on social ecology, minimalizing or even ignoring the importance of natural ecological systems (Coates & Gray, 2012; Zapf, 2009; Teixeira & Krings, 2015). Kemp (2011) challenges the profession to become committed to our ethical responsibilities in making a meaningful environmental presence in social work:

When the profession remains at the margins of environmental efforts, it both neglects its ethical responsibilities to vulnerable populations and loses its vital opportunities to participate in shaping contemporary responses to environmental challenges, particularly around the interconnections between environmental and social issues (Kemp, 2011, p.1205).

As social work educators, we are emboldened to extend this position to social work education. Acting as 'stewards of the discipline'(Shulman, 2007) social work educators are called upon to be 'pioneers in social reform', 'social investigators' and 'agitators' (Attlee, 1920) rather than reducing the complex process of education to a production-line of training students for employers' purposes. As academic activists/agitators, we assert that the anthropocentric focus of the social work profession needs to be challenged and transformed. We argue for a fundamental shift towards ecological social justice, which counters neo-liberal hegemony. In conclusion, there is a basic gap in social work students' critical awareness of globalisation and its impacts on social work at local and international levels. This deficit needs to be addressed as part of our commitment to integrating social responsibility in our teaching.

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La mentoría entre profesores universitarios para el desarrollo de prácticas de Aprendizaje-Servicio: análisis de primeras impresiones

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Resumen

Esta experiencia parte del diseño y puesta en marcha de un programa de mentoría entre profesores universitarios para el desarrollo y transferencia de prácticas de Aprendizaje Servicio en los Grados de Magisterio en Educación Infantil y Primaria en la Facultad de Ciencias Humanas y de la Educación de la Universidad de Zaragoza. El programa se basa en que aquellos profesores universitarios con experiencia reconocida en la aplicación de experiencias de ApS en las que participan estudiantes universitarios, asesoren a profesores noveles de reciente incorporación.

Tras su implementación durante un curso académico, se procedió a evaluar los resultados obtenidos a través de la realización de un total de 14 entrevistas que fueron cumplimentadas por los profesores mentores, y por aquellos otros mentorizados. El análisis cualitativo de la información recabada permite concluir que, efectivamente, los docentes mentorizados han adquirido las habilidades necesarias para transferir a sus estudiantes las competencias necesarias para ser capaces de implementar experiencias de ApS en su comunidad próxima. Por su parte, y gracias a la organización de diversas jornadas, cursos de formación y debates, los profesores que han ejercido de mentores consideran que, además de tener beneficios para los estudiantes del Grado de Magisterio, estas actuaciones tienen una repercusión positiva sobre la misma comunidad social próxima.

Abstract

This experience arises from the design and implementation of a mentoring program among university professors for the development and transfer of service-learning practices in the Degrees in Teacher Training for Primary and Infant Education in the Faculty of Humanities and Education of the University of Zaragoza (Spain). The program implies that university lecturers with recognised experience in service-learning activities that involve university students advise recently incorporated teachers. Having implemented this program for an academic year, the results obtained were evaluated through 14 interviews that were completed by the mentoring teachers and the mentored ones. On the basis of the qualitative analysis of the information collected, it can be concluded that mentored teachers have acquired the skills needed to provide their students with the competencies needed to implement service-learning experiences in their local community. On the other hand, and thanks to the organization of several conferences, training courses and debates, the professors who had the role of mentors consider that, in addition to having benefits for students of the Education Degree, these actions have a positive impact on the social local community.

1. Introducción

Las experiencias de Aprendizaje-Servicio (ApS) están siendo cada vez más implementadas en ámbitos vinculados a la enseñanza de educación superior (Berasategi, Alonso y Roman, 2016; Bialka y Havlik, 2016). Tal y como apuntan Bates, Drits, Allen y McCandless (2009), y Campo (2010), nos hallamos en la actualidad inmersos en un contexto idóneo para la aplicación y desarrollo de prácticas de ApS que ofrezcan a la comunidad universitaria la posibilidad de implicarse activamente en un tipo de aprendizaje más participativo. Todo ello

se enmarca en un entorno en el que se está reclamando, de un modo visible, una preparación para el ámbito profesional basada en la responsabilidad social y personal (Aramburuzabala y García, 2012; Martínez Domínguez, 2014).

A la luz de estos hechos, la importancia de la aplicación de prácticas de ApS en la formación de los futuros docentes comienza, indudablemente, desde una adecuada transmisión de competencias por parte del profesorado universitario responsable de dirigir y coordinar estas experiencias con su alumnado. Desde la Facultad de Ciencias Humana y de la Educación, durante el curso 2015/2016 a través de un proyecto PIDUZ se diseñó un programa de mentoría para profesores universitarios con el fin de desarrollar prácticas de Aprendizaje-Servicio. Los motivos por los que en su día se optó por diseñar este programa fueron que cada año se incorporaban a nuestro centro gran número de profesores nuevos, muchos de los cuales no conocían los programas de ApS.

Además, en la Jornadas que realizamos el curso 2014-2015 para difundir otro Proyecto de Innovación Docente, surgió la necesidad de diseñar un plan de formación para docentes universitarios y un acompañamiento en la puesta en marcha de prácticas de ApS. También este proyecto responde al plan de innovación y mejora del centro. Todo esto llevó a diseñar el programa de mentoría en ApS implementado durante los cursos 2016-17 y 2017-18. En el curso presente, se planteó el objetivo de evaluar la implementación de dicho programa con el fin de autoevaluar el proceso y valorar los efectos positivos que ha tenido en los agentes implicados, en el entorno próximo y en las posibilidades de mejora.

2. Metodología

El análisis aquí presentado corresponde a una valoración cualitativa realizada a partir de las respuestas a 14 entrevistas concedidas por el profesorado mentor y el profesorado mentorizado que han participado en este programa de mentoría para el desarrollo de experiencias de ApS en la Facultad de Ciencias Humanas y de la Educación de Huesca. Dicha información recabada se presenta atendiendo a los bloques de contenido en la que esta entrevista quedó estructurada, y considerando las opiniones de ambos grupos de profesores participantes. Todo ello, forma parte del proceso de evaluación de la aplicación de un Programa de Incentivación de la Innovación Docente de la Universidad de Zaragoza, cuyo código es PIIDUZ_18_123.

3. Resultados

a) Utilidad del programa de mentoría entre profesores universitarios para el desarrollo de experiencias de ApS

Desde la perspectiva del profesorado mentor, se destaca que el programa permite transferir y difundir experiencias sobre Aprendizaje-Servicio (ApS) a profesorado más novel en el ámbito universitario. Considerando además la numerosa cantidad de profesorado asociado a tiempo parcial con la que cuenta en la actualidad la Facultad de Ciencias Humanas y de la Educación, este programa permite que el conocimiento de la metodología de aprendizaje servicio no sólo llegue a profesorado asociado novel, sino que este profesorado también pueda difundirla en sus entornos de trabajo. Todo ello, amplifica enormemente la utilidad de este programa de mentoría, pues el ApS se puede aplicar en todos los contextos profesionales, no sólo con proyectos del ámbito universitario.

b) Relación entre el ámbito teórico y práctico en sesiones de mentoría para el desarrollo de prácticas de ApS

Tanto el profesorado mentor como mentorizado, comentan que las jornadas que se organizan en la Facultad, dirigidas a todo el profesorado, son el evento cumbre para mostrar cómo se ha interrelacionado la teoría con la práctica, puesto que en las mismas se muestran diferentes proyectos llevados a cabo y su relación con asignaturas de los grados universitarios de maestro. En estas jornadas se vio reflejados también el aprendizaje del alumnado universitario participantes en experiencias de ApS sobre la realidad social y el entorno cercanos.

c) Actividades concretas trabajadas en las sesiones de mentoría entre profesorado mentor y novel

El análisis de la información recabada de ambas poblaciones participantes (profesorado mentor y mentorizado), ha arrojado un conjunto de actividades destacadas dentro del desarrollo de este programa de mentoría en ApS que, a continuación, se detallan:

- Sesiones informativas y formativas con expertos en APS.
- Cómo organizar programas de ApS, elementos necesarios en los programas, selección de escenarios para los mismos, bibliografía, etc.
- Revisión de programas. Fortalezas y debilidades de los mismos, estudios longitudinales, evaluación de su impacto en el entorno, etc.
- Programas de APS y estudios de Grados de maestro. Implementación en asignaturas de los grados de maestro. Tanto en parte teórica de la asignatura como en sesiones prácticas.
- Sesiones de encuentro y reconocimiento. Crear grupos de trabajo cooperativo que fomente la confianza entre los participantes.
- Información y debate sobre la inserción del profesorado en la Universidad y en nuestro Centro. Redes de apoyo. Docencia e investigación.

d) Dificultades encontradas durante el desarrollo del programa

Las dificultades y obstáculos percibidos varían ciertamente entre el profesorado novel y el profesorado mentor. En lo que respecta a los profesores mentores, han aludido a la dificultad horaria para compaginar los trabajos externos y la responsabilidad de tareas docentes como figura de Profesor Asociado. La poca estabilidad en la plantilla, en muchos casos, impide el acercamiento a esta metodología que demanda un compromiso continuado en el tiempo. La falta de financiación y el exceso de trabajo que conlleva aplicar este tipo de programas, también han sido mencionados. Finalmente, el profesorado mentor ha destacado la variedad de temáticas y escenarios posibles y cómo incardinarlos en programas que resulten viables.

e) Respaldo al programa por parte del equipo docente coordinador

Las respuestas ofrecidas por parte del profesorado mentorizado, han resultado coincidentes al mencionar el total y absoluto respaldo del equipo de docentes responsables de la coordinación de este programa de mentoría entre profesores universitarios, desde su configuración e implementación hasta la evaluación. No obstante, el profesorado novel menciona

ciertas dificultades en la organización de espacios y tiempos entre todos, equipo docente y profesores noveles, y la falta de recursos económicos como factores que han incidido en que, en ocasiones, se hayan visto mermadas las posibilidades reales del programa.

f) Beneficios del programa para la institución en la que se ha desarrollado

Los profesores mentores han destacado que la universidad tiene una responsabilidad social que conlleva una implicación de la misma en la mejora del bienestar de toda la ciudadanía, por lo que la imagen social de la propia Universidad mejora por el hecho de llevar a cabo programas de ApS. A todo ello, se le añade que la visibilidad de la Universidad es mayor y más positiva cuando se ve implicada en proyectos de inclusión social, multiculturales, medioambientales o proyectos de salud que mejoran la calidad de vida de toda la ciudad. La Facultad de Ciencias Humanas y de la Educación se presenta ante la sociedad oscense como un recurso positivo para su propio desarrollo social, económico y cultural.

g) Mejoras planteadas para futuros programas de mentoría en ApS

Profesores mentores y mentorizados coinciden en señalar que, en estos momentos (y no sólo para programas de ApS, sino para cualquier otro proyecto de innovación universitario) resultaría necesario incrementar el número de profesorado a tiempo completo en la Universidad y que se estabilizase plantilla. El exceso de interinidad facilita la difusión de proyectos a la sociedad (porque los asociados los pueden implementar en sus contextos de trabajos principales), pero no facilita equipos universitarios estables y cohesionados al rotar e ir cambiando gran parte de sus componentes periódicamente. Se menciona también la necesidad de contar con un mayor apoyo institucional para poder utilizar el ApS como metodología transversal, recibir un reconocimiento por parte de mentores y tutores y protocolizar el proceso con mayor detenimiento.

h) Valoración cuantitativa de percepciones sobre la implementación de este programa de mentoría de ApS entre profesorado universitario

Derivado del análisis cuantitativo a los 6 ítems propuestos, se concluyen las percepciones más positivas, para ambos grupos de profesores, en cuanto a la búsqueda del programa de ApS de una mejora de la calidad en la aplicación de metodologías activas de aprendizaje. Se han valorado también como positivas la estimulación de la colaboración entre aquellos docentes expertos en ApS que formaban parte del programa, y la flexibilidad del programa en la atención a los intereses de los principales implicados. El análisis de resultados también hace resurgir el debate de la necesidad de disponer de más recursos humanos y técnicos para garantizar la calidad de su adecuado desarrollo.

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Estrategias para lograr la formación integral del docente en el área química

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Resumen

La seguridad, el medio ambiente, la calidad, la sostenibilidad, la equidad, la responsabilidad, son términos que se pueden aplicar en muchos ámbitos de nuestra vida. Todos ellos, tienen cabida en la formación académica de un docente dedicado a la enseñanza de la química. No solo es imprescindible una base intelectual y conceptual de una de las infinitas ramas de la química, sino también, un bagaje complementario integral, en aspectos directamente relacionados con el mundo de esta ciencia básica. Es por ello que, desde el Departamento de Química del Centro Universitario de Ciencias Exactas e Ingenierías (CUCEI), de la Benemérita Universidad de Guadalajara de México (UDG), nos dimos a la tarea de enriquecer el conocimiento de los docentes y personal técnico, que día a día trabaja en pro de los futuros profesionales del ramo químico. De igual manera, en los últimos tiempos, tanto autoridades como docentes, han participado de manera colaborativa en la búsqueda del logro de la calidad en el proceso enseñanza aprendizaje. La Coordinación General Académica, creando el Programa de Formación, Actualización y Capacitación Docente (PROFACAD), el cual viene a fortalecer las líneas de generación y aplicación del conocimiento de los académicos adscritos al área de química. La participación de los académicos se ha visto reflejada, en la mejora de la calidad de la enseñanza, así como el fortalecimiento de los valores personales. Se ha creado conciencia, en el cuidado del medio ambiente y la sostenibilidad de todos los procesos educativos y de actuación del plan de desarrollo de la Institución.

Palabras clave: CUCEI, formación integral, actualización curricular y sostenibilidad.

Abstract

Safety, environment, quality, sustainability, equity and responsibility, are terms we can apply in several areas of our lives. These concepts have an important place for the academic training of a teacher, especially those who are involved in chemistry areas. Nowadays, an intellectual and conceptual basis is not enough for the academic profile, it is necessary to promote the formation of the academic staff in terms of complementary topics related to chemistry, industry and science in general. That is why, the Department of Chemistry at the Center of Exact Sciences and Engineering (CUCEI), from the University of Guadalajara in Mexico (UDG), undertook the task of helping the personnel training by offering a series of courses in different areas such as: "first aids training", "treatment and waste management" and "self-care of health". These courses were part of the extracurricular training of the academics and technical staff in the spirit of the continuous updating of our department. In the same way, authorities and teachers have collaboratively participated in order to achieve the improvement of quality of teaching-learning process. For that goal the General Academic Coordination created the Teacher Training, Updating and Training Program (PROFACAD), which will strengthen the lines of generation and application of the knowledge of the academics assigned to the chemistry area. Participation of academics has been reflected in the improvement of quality teaching, as well as the strengthening of personal values. Awareness has been created in the care of the environment and the sustainability of all educational and action processes of the Institution's development plan.

Keywords: CUCEI, integral education, curricular update and sustainability.

1. Introducción

La Química, ciencia complicada, combina una teoría muy amplia, con la práctica dentro de laboratorios de docencia, a un nivel formativo inicial y se manifiesta exigente, en las prácticas profesionales, que las industrias del ramo ofrecen en una etapa de especialización de los estudiantes. En ambos casos, es el marco social, es el contexto real, el que da la pauta para considerar que problemas diarios deben enfrentar tanto académicos, como aprendices y que competencias, habilidades, aptitudes y actitudes, deben de tener los dos entes, para lograr una formación integral adecuada. Para el desarrollo de estas competencias podemos considerar la propuesta de Parra, Tobón y López (2015), quienes expresan que la socioformación, como modelo educativo para el desarrollo de competencias, da respuesta con idoneidad y compromiso ético a los problemas del contexto. Dichas competencias, son consideradas como dinámicas abiertas con prácticas en lo local, pero con una visión global que implican saber conocer, saber hacer, saber convivir y saber ser, además de fortalecer el cambio de un modelo educativo centrado en la enseñanza a un modelo educativo focalizado en la formación integral para alcanzar un tipo de educación que apoye el desarrollo de valores y talentos tanto de profesores como de estudiantes, logrando así, el desarrollo de una sociedad solidaria y equitativa (Salazar y Tobón, 2018).

Los roles tradicionales ya han cambiado. El docente es el encargado de orientar el desarrollo de los jóvenes mediante el cultivo de una serie de competencias genéricas, específicas y profesionales, e ir acompañándolos en su formación. De manera paralela, él también se forma y desarrolla competencias, por tal motivo la formación pedagógica al respecto retoma gran importancia y la capacitación del personal docente se torna imprescindible. En su obra "Como realizar un proyecto de capacitación" (Pain, 2012) menciona que la capacitación es un proceso, porque está formada por una serie de etapas que facilita al colaborador de una organización el desarrollo de conocimientos, mejora sus habilidades y comportamientos, para desempeñar el puesto de trabajo encomendando, facilitándole las oportunidades de crecimiento dentro de la empresa. La capacitación lo que busca principalmente es que no solo el colaborador de una empresa se empape de conocimientos, sino, que también se aprecie en la transformación de su actitud para que pueda ser más eficiente en el puesto de trabajo que está desempeñando (Rodríguez, 2018).

La educación superior debe, concordar con las nuevas demandas que exige hoy en día la sociedad, sin renunciar a la identidad a la que se debe. Hay que comprender la génesis y la evolución de la institución universitaria, con el objeto de proponer la misión para este siglo XXI, dejando claro que se debe conjugar la docencia y la transmisión de la cultura, junto con la investigación, la transferencia del conocimiento y la dimensión social de la institución (Ruiz y López, 2015). En este contexto, la Universidad de Guadalajara de México (UDG), con 225 años de historia, se ha desempeñado siempre, como semillero de conocimiento, formadora de profesionistas y sólido referente académico tanto en Jalisco como en México durante más de dos siglos (Real, 2019). A través de la Coordinación General Académica y del propio Departamento de Química, se está logrando dicha conjunción.

2. Mecanismo de actuación

Durante el periodo 2013-2016, los cursos de actualización curricular, eran propuestos y coordinados por los Departamentos respectivos, en función de las necesidades específicas de formación. Conscientes de la responsabilidad social que la disciplina conlleva y la necesidad de una adecuada actualización de los académicos del Departamento de Química, se consideró la impartición de cursos en temas clave tales como: *seguridad en los laboratorios, ma-*

nejo y almacenamiento de residuos y primeros auxilios, así como otros de especialidades, los cuales, quedaron registrados y avalados por la Secretaria Académica del Centro Universitario. A partir del año 2016, la Coordinación General Académica de la UDG, presentó el Programa de Formación, Actualización y Capacitación Docente (PROFACAD), dando a conocer los lineamientos del mismo, convirtiéndose en un referente para lograr una certificación formativa integral y un estímulo económico asociado (UDG, 2016). En dicho programa, se ofrecían cursos de índole diferente, pero generales en contexto y que buscaban ampliar el bagaje cultural y profesional de los académicos que los tomaran.

3. Resultados y discusión

En este apartado, se muestran en primer lugar, los resultados de la asistencia a los cursos de actualización docente impartidos en el periodo 2013-2018, por parte de la planta académica del Departamento, compuesta por 102 académicos, de los cuales 49 son profesores o investigadores de tiempo completo, 36 son maestros de asignatura y 17 son técnicos académicos de tiempo completo. En la *Tabla 1*, los coordinados desde el propio Departamento, con una duración mínima de 40 horas, donde se puede apreciar, la especialización de los mismos y la relevancia de los temas tratados.

Tabla 1
Cursos 2013-2018 Departamento de Química y asistencia total

Año	Curso Actualización	Asistencia T//F/M*	Curso Disciplinar	Asistencia T//F/M*
2013	—Estrategias y técnicas didácticas —Rediseño del programa de estudios enfocado en competencias —Web 2.0; su aplicación y utilidad en la educación	15//12/3 12//10/2 10//6/4	—Titulación y electroquímica	15//10/5
2014	—Herramientas didácticas en la práctica docente	26//15/11	—Espectroscopia de EPR	45
2015	—Curso básico de primeros auxilios para académicos y administrativos del CUCEI —La reanimación cardiopulmonar y su complemento practico con el uso del desfibrilador	49//28/21 35//20/15	—Gestión y manejo de los residuos peligrosos en los laboratorios químicos —Equilibrios Iónicos Simultáneos —Introducción a la cristalografía	26//14/12 15//6/9 19//11/8
2017			—Sistemas de Gestión de Riesgos Aplicados a Procesos de Producción ISO-9001: 2015	30
2018			—Taller de Manejo de Resi. duos Peligrosos	65

* T//F/M: asistencia total académicos/ femenino / masculino.

Inicialmente no existía un gran interés por participar en la capacitación que se proporcionaba, por lo que algunos cursos fueron obligatorios para el personal de los laboratorios de

docencia y de vinculación. La *Fig. 1* muestra la participación en el *Taller de manejo de residuos peligrosos*; con la asistencia de personal de varias unidades académicas (2018).

Figura 1

Asistencia al Taller de manejo de residuos peligrosos

Fuente: OSCAR Consultores (http://oscar.org.mx/).

Tras el inicio, en el 2016, del programa PROFACAD, semestre a semestre y la novedad de los contenidos, la participación fue en aumento, en todo el Centro Universitario. En la *Tabla 2* se pueden ver los resultados de la asistencia para el Departamento de Química. Se percibe un incremento del personal asistente, salvo en el periodo 2017B, en el cual, se llevó a cabo un proceso de acreditación internacional y los académicos, disponían de menos tiempo para esta actividad.

En la *Fig 2*, se muestra las asistencias totales, a los diferentes cursos ofertados, de los cuatro Departamentos que configuran la División de Ciencias Básicas del CUCEI. Se puede ver, que el mayor interés, se centró en aquellos que se relacionaban con el diseño de programas por competencias, aprendizaje centrado en el estudiante, formación con base en solución de problemas orientado a proyectos e introducción a la didáctica.

Tabla 2

Asistencia a cursos PROFACAD, Departamento de Química

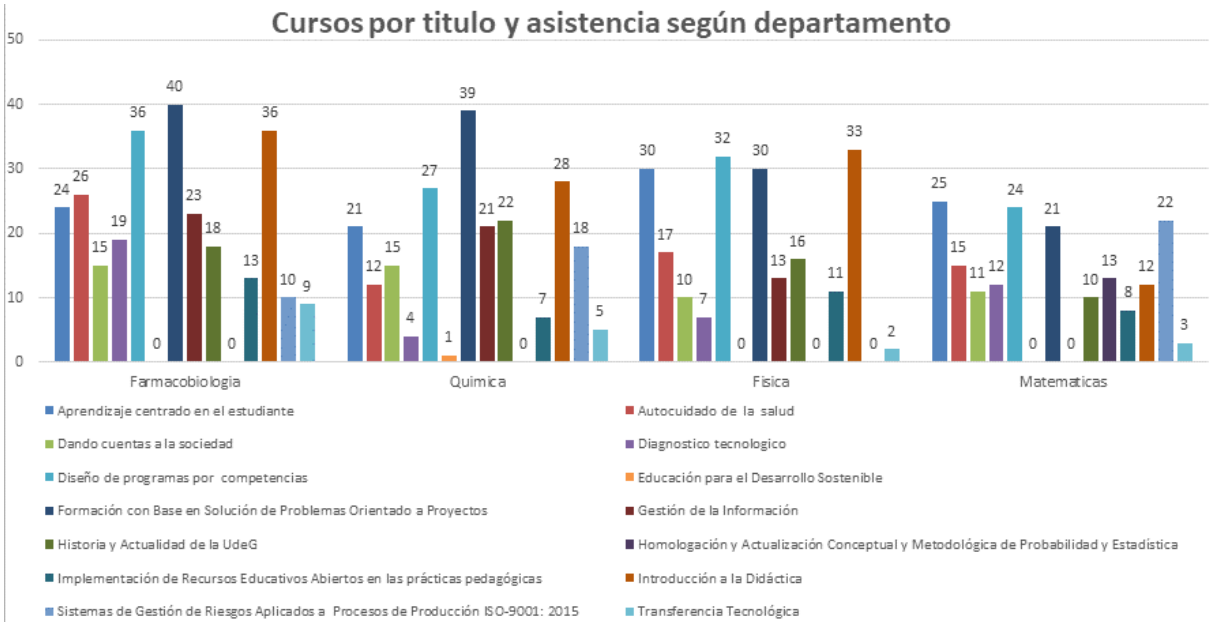
Asistencias totales a cursos*	220				
Docentes	72	Femenino	35	Asistencias Femenino	118
		Masculino	37	Asistencias Masculino	102
Por calendario					
2016 A	23				
2016 B	79				
2017 A	99				
2017B	19				

* *Fuente:* Elaboración propia con datos de la Coordinación de Servicios Académicos del CUCEI.

Toda la planta docente, consciente de los puntos débiles, consideró con su participación en estas actividades, que el aprendizaje era parte de su desarrollo profesional y ello influía de manera directa, en la mejora del proceso enseñanza-aprendizaje del alumnado.

Figura 2

Asistencia a cursos División de Ciencias Básicas

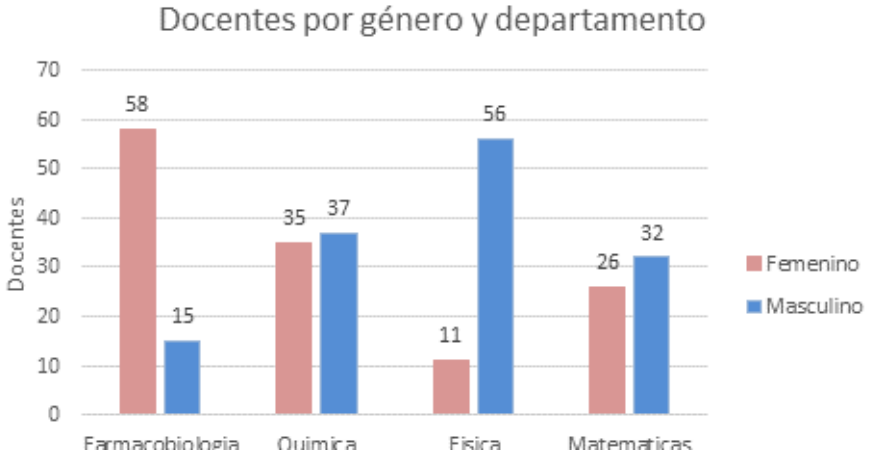


Fuente: elaboración propia con datos de la Coordinación de Servicios Académicos del CUCEI.

En la *Fig 3*, se muestra la participación de los cuatro Departamentos, en base al género de su planta académica. En la *Fig 4*, se puede ver la numeraria y los porcentajes totales de asistencia, por parte de la División de Ciencias Básicas. En el caso particular del Departamento de Química, asistió el 70 % de los maestros, lo que deja patente, el compromiso de los formadores de los futuros profesionales de la Química, por actualizar sus conocimientos y adquirir herramientas de pedagogía nuevas, que les permita lograr una formación integral de sí mismos e inculcárselo a los estudiantes, en un ambiente de participación, ética profesional y alto sentido de servicio a la comunidad.

Figura 3

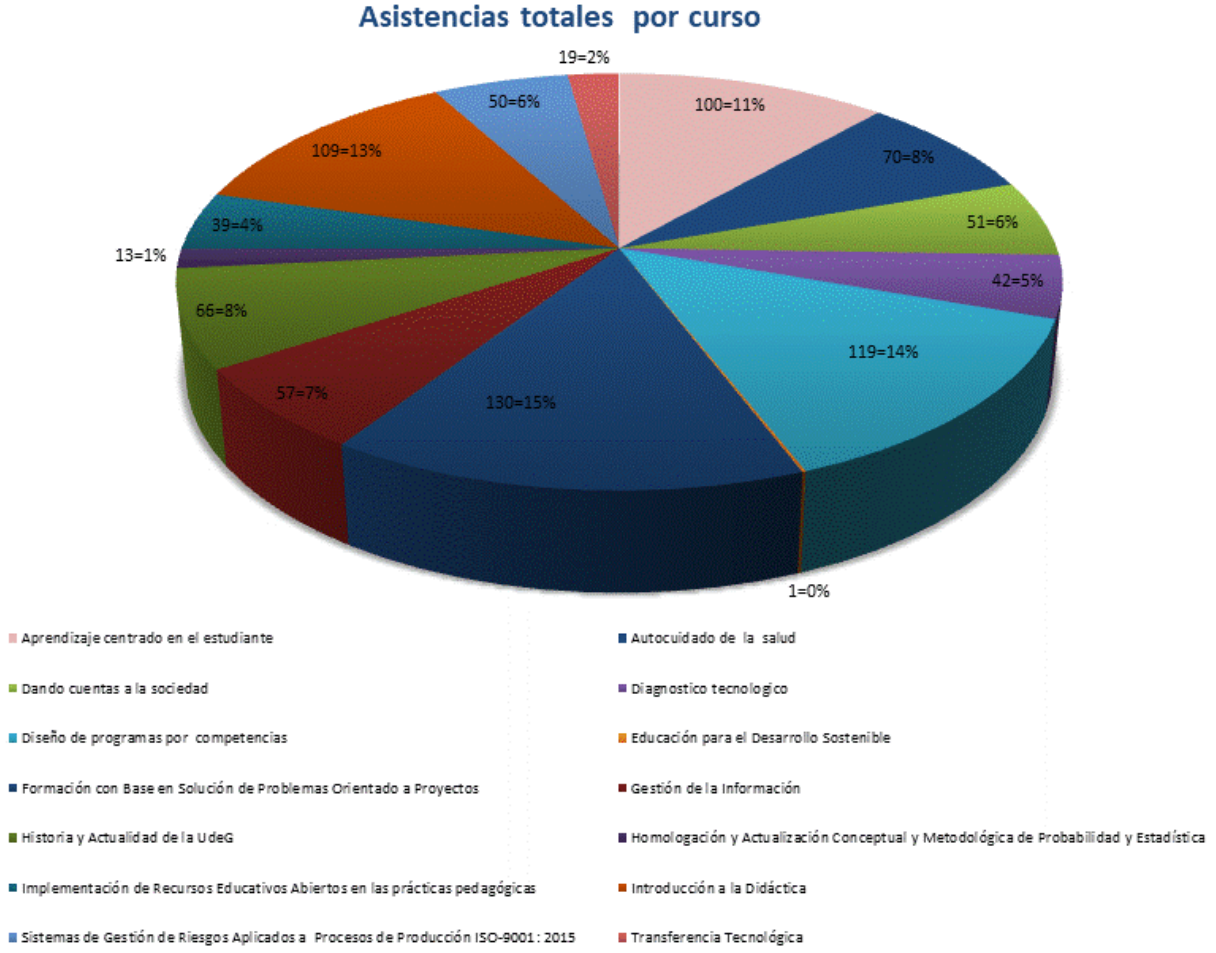
Participación por género, División de Ciencias Básicas



Fuente: Elaboración propia con datos de la Coordinación de Servicios Académicos del CUCEI.

Figura 4

Asistencias totales y porcentaje por curso en la División de Ciencias Básicas



Fuente: elaboración propia con datos de la Coordinación de Servicios Académicos del CUCEI.

4. Conclusiones

Una vez identificadas las necesidades de los profesores en el ámbito educativo, hay que fortalecer estas deficiencias mediante la programación de una capacitación docente continua tanto en el área disciplinar como de formación docente, es importante que esta capacitación vaya de la mano con brindar al docente herramientas que le permitan a su vez identificar las carencias y necesidades educativas, tanto grupales como individuales de sus alumnos.

Al ser un ente fundamental en la docencia el profesor también tiene que tomársele en cuenta al momento de programar los cursos de capacitación ya que esto permitirá conocer las fortalezas y debilidades de cada uno en su labor educativa, buscando así que la capacitación sea fructífera, mediante una investigación —acción participativa de docentes y la administración—.

Es importante reconocer que los cursos de formación docente no deben venir a sustituir a los disciplinares, ya que cada uno tiene un enfoque diferente, y en los cuales se busca contar con profesores que al mejorar su proceso educativo, logren formar profesionistas con ex-

celencia, capaces de enfrentarse y responder a las necesidades de su vida laboral y cotidiana con eficacia y responsabilidad, fomentando así los valores con una ética profesional.

La capacitación en las instituciones educativas, con programas como el PROFACAD, permitirá monitorear la gestión y quehacer educativo orientado a la identidad de la institución educativa.

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Improving science literacy among bachelor's students in Earth Science

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Abstract

A handful of activities has been explored and implemented to improve Earth Science students' abilities to engage —as reflective citizens— with geoscience-related issues and ideas. Engaging in a reasoned discourse on Earth Science requires, among other things, the ability to recognise, describe and assess explanations for a range of geological phenomena. By generation of research questions to literature relevant for essay assignments, the students are compelled to deal with literature at an earlier stage. Writing and peer-reviewing of essays expose the students to the topics in several ways. Getting individual feedback from peers and teachers make the students able to further develop and improve their geoscience literacy by becoming more aware of their own strengths and weaknesses.

1. Introduction

1.1. Geoscience literacy

Geoscience literacy, as summarised in university-programme learning outcomes, typically include the ability to describe, explain and predict processes, understand and interpret, ask and find answers to questions, evaluate the quality of geoscientific information based on its sources and methods used, communicate and make informed decisions. The NSF funded Earth Science Literacy Initiative (http://www.earthscienceliteracy.org) simply states that "*Earth science literacy is an understanding of Earth's influence on you and your influence on Earth*", and provides a guide for education comprising big ideas and supporting concepts.

1.2. The subject and course history

Geomorphology, the scientific study of landforms and land-forming processes. The subject is well-suited for activities that promote improved literacy in Earth Science: either by applying traditional fieldwork to provide hands-on experience with various types of mapping with subsequent application of digital visualisation tools, or by applying quantitative, process-oriented approaches (e.g. numeric modelling). The Geomorphology course at UiB focus on written and digital literacies, and aims to make the students more aware of language as a tool of thinking (cf. Dewey 1910). It is optional for students at Bachelor's and Master's levels, and has an upper limit of 20 students. The course has been transformed from a traditional Norwegian university course with 20 lectures, excursion, and final written exam, to a course with no lectures, no syllabus, no excursion, and no exam. Instead, we meet at 8-10 seminars over 12 weeks. Many aspects of the transformation have taken place within the framework of the Teaching and Learning in the Digital Age project (https://talida.w.uib.no).

2. Course Design

The course starts with two seminars, browsing and reference handling, given by the Science Library, followed by three subsequent individual literature assignments consisting of three parts: i) generate three research questions, ii) write an essay text on the topic (max. 1,500 words), and iii) peer-review of the work of two other students. Essays are handed in using a seminar tool integrated into the university's learning management system where the students automatically are assigned texts to read and comment. The two first assignments are based on scientific literature, whereas the third is based on a self-chosen case or topic that has occurred in the media (cf. Contemporary Issues Journal, Barkley and Major 2016). All texts are commented on by the teacher. In 2019, students were offered 30 minutes individual supervision to go over the comments after the two first assignments to ensure that teacher feedback was fully understood (cf. Brown *et al.*, 1997). The fourth and final assignment is field-based. It includes a health and safety component with a mandatory pre-fieldwork risk assessment, and typically requires 1-2 days of field investigation. The groupwork is presented as a poster for the other students and two external teachers, as well as an illustrated popular science text intended for publication on www.grind.no, the University of Bergen's portal for communicating knowledge about the landscape and environment. The course uses portfolio assessment of the three revised individual texts, and the product of the group work. A short, reflective text is also compulsory in the portfolio. The reflective notes are not graded, in fact, they are not read until after the grading when they are used for improvement the course.

3. Reflections

3.1. Students' prior experiences

The students' prior experience with writing at the university is mainly limited to short assignments, excursion reports and written exams. A common denominator for these types of texts is a final assessment limited to a grade or accepted/not accepted, without any comments on what the student masters and what improvement may be needed.

3.2. Finding and citing sources

The seminars given by the Science Library aim to make the students able to find relevant literature, and correctly cite sources used. However, the individual assignments seem necessary to practice browsing and citing, as well as developing an understanding of the reliability and quality of different sources of information. A clear development is seen through the course; from citing lecture notes, text books, and arbitrary encyclopaedias and web sources, to citing peer-reviewed research articles and other sources.

3.3. Creating research questions

The task of formulating research questions is intended to make the students use the literature in a more active way: not only as a source of information, but also to approach it in a more enquiring manner. Composing questions is an unfamiliar task for the students, but it compels them to read the selected literature well before handing in their essays. The questions are used in seminar discussions to show how to identify good and weak questions.

3.4. Writing individual texts

Science has its own language (Wellington and Osborne 2001) with a vast vocabulary, and the terms are used in specific areas and ways. To be literate in a discipline is more than knowing its terms and expression (cf. Olson 1994). One common challenge the students face is to distinguish between oral and written styles, and incorrect grammar reveals a lack of basic understanding of terms and key-concepts in geoscience, even after 5-7 semesters. This might be due to a lack of practise in discourse. Many students find it difficult to work with topics on their own, i.e. they miss having lectures providing them with the essential subject content. However, they also realise that this is a useful preparation for embarking on a Master's project. In the third assignment, they are asked to find one or several recent cases reported in the media of geohazard or geological events. The assignment asks for a summary of the media coverage, followed by a geological explanation. By choosing their own topic, the students train their abilities as reflective citizens.

3.5. Peer-reviewing

The peer-review component, where each student comments on the essays of two other students, is unfamiliar to most students. The students are curious to read texts written by their peers, and all texts are available to them. Many have never given or received peer feedback, and this transparent and collaborative writing process can clearly be experienced as challenging in the beginning. However, peer feedback makes students learn from each other and develop critical thinking skills.

3.6. Individual feedback

The teacher provides feedback and suggests improvements on all essays because this is considered vital for the learning process (e.g. Ramsden 1992; Black and Wiliam 1998). Most students express a gratitude for getting individual feedback aiming at improvement. The students are encouraged to consider comments given by peers and teacher when revising their first version into the second and final version of the text. In 2019, most (75%) students enthusiastically carried out review and revision between each assignment, while some (25%) did not take the opportunity to improve.

3.7. Group assignment

The fourth assignment is a group task in the field, and it intends to give the students experience in teamwork through jointly planning, performing and reporting from a field investigation. Both the work and the science should be fairly simple, as the main aim of the assignment is for the students to successfully manage on their own. Successful fieldwork experience in a small group of peers is believed to lower the threshold for undertaking independent fieldwork later.

4. Results

Our experience from systematically changing the course design suggests that the value of the current design of the course lies in helping students develop their geoscience literacy

by making them more confident in how to find, evaluate and use sources, discern between written and oral geoscience discourse, scientific and non-scientific communication styles, as well as to communicate with peers and others.

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Enhancing Teaching & Learning by Developing Scholarship in Staff through Facilitated Collaborative Writing Retreats

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Abstract

An alternative model of writing retreats is being established by the Leeds Institute for Teaching Excellence (LITE) to promote scholarship in teaching and learning. These comprise of individuals from different disciplines coming together to research and write about teaching and learning topics through structured writing retreats and pre- and post-retreat activities. The initiative encourages cross-institutional collaboration in teaching and learning research and discourse by facilitating high-quality publication outputs. Ultimately the intention is to increase capacity and competence in learning and teaching scholarship through supported writing and mentorship. Our model is informed by the experience of the emerging literature on international collaborative writing groups (Marquis, 2014; Motley *et al.,* in press) and on writing retreats (Kornhaber *et al.,* 2016). In particular, our ethos is inspired by the central theme emerging from the work of Vince and Reynolds (2010) who highlight the transformational potential of moving beyond individual, private practitioner reflection towards collective, public reflection at the organisational level. In this session we will describe our approach to institution-wide collaborative writing retreats within the context of LITE activities (Hallett *et al.,* manuscript submitted). We will present some initial qualitative and quantitative data that speaks to the motivations and development of participants.

1. Introduction

Scholarship of Teaching and Learning is driven by the desire to 'promote research-informed teaching' Fanghanel *et al.* (2016). One of the most effective means to promote reflection, debate and enhancement of teaching practice is by encouraging practitioners to publish. Here we report on an alternative model of writing retreats established by the Leeds Institute for Teaching Excellence (LITE), at a research-intensive UK university, to promote collaborative writing focussed on Learning and Teaching.

Structured writing retreats and writing groups and their role in developing academic staff by supporting writing competence, building communities of practice and facilitating increases in publication outputs have been extensively reviewed in the literature (Kent *et al.,* 2017; Kornhaber *et al.,* 2016 and references therein). Typically, members of writing groups meet for mutual support and feedback whilst working separately on their own articles. In recent years the ISoTL ICWR initiatives have taken a different approach, bringing together individuals from different disciplines and nations to work on research projects and publications. These initiatives aim to develop teaching and learning scholarship and ultimately transform teaching and learning practices Marquis *et al.* (2016).

The Leeds Institute for Teaching Excellence (LITE) has established an alternative model of writing intervention to support teaching focussed staff at the University of Leeds in the area of teaching and learning scholarship by promoting collaborative writing on topics of emerging significance. Our model is informed by the literature on international collaborative writing groups (Marquis, 2014; Motley *et al.,* in press) and on writing retreats (Kornhaber *et al.,* 2016). In particular, our ethos is inspired by the work of Vince and Reynolds (2010) who

advocate the transformational potential of moving beyond individual, private practitioner reflection towards collective, public reflection at the organisational level. Ultimately the intention is to increase capacity and competence in teaching and learning scholarship through supported writing and mentorship.

2. The Lite Writing Retreats Project

Project Design

Teaching-focussed staff from across the University of Leeds joined the project to work together to research and write about teaching and learning topics. They did this through two structured writing retreats and follow on activities such as self-organised project meetings. The retreats replicated the conditions identified by Kornhaber *et al.* (2016) for successful retreat outcomes. They offered participants a supportive environment, where they could collaborate to develop writing skills and build confidence. Participants worked in groups and were encouraged to share ideas and reflect on their writing practice. The retreats were facilitated by LITE staff with significant experience of SOTL and collaborative writing, and an academic developer with a specialism in academic writing.

At the initial retreat, participants elected to join a group working on one of three broad topics: Learning Environments, Resilience and Transitions. Groups then narrowed down these topics into a focussed area of investigation that was compatible with individual's interests. They then planned their research project, agreeing approaches and timelines. Following the retreat, groups continued to work together on their projects. A second facilitated retreat offered further protected time to work on their papers. This retreat also gave groups the opportunity to request additional training and they opted for research methods training support on systematic reviews. Throughout the project, organisers have kept in touch with teams, checking in frequently, to enquire after progress.

Participants were drawn from 10 schools and services across University of Leeds, giving a diverse mix of disciplines across the groups. Online surveys were used to find out about motivations for joining the project and assess retreat experiences to help plan activities.

Questionnaires

Nine out of eleven participants shared their motivations for taking part in a pre-retreat questionnaire. Some wished to gain experience of writing academic papers in general and more specifically papers in learning and teaching. Around 40% of participants held teaching only roles and so viewed the initiative as a way of gaining permission to write as one participant stated "...love to have time set aside specifically for writing. It isn't part of my current role." Others with previous publishing experience within their discipline saw taking part as a way to gain confidence and develop as an academic writer. Other motivations came from the opportunity to collaborate in an interdisciplinary context.

The challenge participants most frequently identified was finding time to write. Some also cited the difficulties that might arise from collaboration with new colleagues "We will need to find ways of combining our different perspectives and voices in a productive way." For some there was also a recognition that a lack of confidence in their writing ability might hold them back "...fear of not delivering, so I might need some support...".

Five out of 11 participants responded to a post-retreat questionnaire. Concerns about the time commitment and the disciplinary differences were common. Some also expressed concerns about how a broad area of common interest could be turned into a viable publication. It was clear that several respondents were also circumspect about the volume of work ahead.

Meeting the needs of participants

We addressed participant concerns in the following ways. A deadline for groups to submit an outline of their project for feedback was given to encourage groups to meet up regularly to work on their projects. The LITE team were in contact with groups regularly, asking about progress and giving additional support when required. However, one group, the smallest with three members, withdrew. The members citing time pressures of their roles as the reason.

During the second retreat we set aside time to address some of the barriers identified by participants in the questionnaires and in personal correspondence with the LITE team. Discussions around differences in research approaches were facilitated through a skills development session reviewing common paper structures in different disciplines. By the end of the retreat the two remaining groups had a clear idea of what their papers will look like and plans of how to work together to achieve this. They continue to meet up to write and manuscript are expected for submission in Summer and Autumn 2019.

3. Conclusions

Initiatives like this, offering mentorship to staff, have a real potential to increase the capacity and competency of staff in the area teaching and learning scholarship. This investment in staff development also has the potential to transform teaching practice and scholarship at an organisational level. By supporting this collaborative writing project. LITE can evidence its impact, promoting excellence in research and innovation in student education and hence advocate further support and allocation of resources for staff development.

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Esperimentazio fisikoaren eta birtualaren uztarketan oinarrituriko Estrategia Didaktikoa Sistema Diedrikoan ikaskuntza-prozesu esanguratsua lortzeko

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Laburpena

Azken ikasturteetan, Gipuzkoako Ingeniaritza Eskolan, ingeniaritza-graduetako lehenengo mailako Adierazpen Grafikoa irakasgaian, sistema diedrikoari dagozkion kalifikazioak baxuak izan dira. Ikasleriaren profila izan ahal da arrazoietako bat. Espazio tridimentsionalaren ikusmen-gaitasuna paper eta arkatz hutsean oinarritzen den metodoen bitartez interpretatu eta bisualizatzeko zailtasunak dituzte. Ikusmen espazialak, sistema diedrikoaren bidez irudikatu, planteatu eta ebazten diren egoera guztien gakoa denez, emaitza onak lortzea zaildu egiten du. Aurrekari hauen aurrean, irakasle taldeak irakats-ikas jardunean aldaketak egitea erabaki du, eta sistema diedrikoaren ikaskuntza-prozesua sendoagoa bezain bizigarriagoa izateko helburuz, estrategia didaktiko berritzaile bat diseinatu du. Estrategiaren zorua UPV/EHUko Irakaskuntza Kooperatiboa eta Dinamikoa (IKD) eredu pedagogikoa da, zeina Arazoetan Oinarrituriko Ikaskuntza metodologia aktiboan gorpuzten baita. Kooperatiboa, ikasgelan oinarri teorikoak lantzeko jarduera kolaboratiboak definitu direlako; jarduerak dedukzio-prozesu bat gauzatzeko prestaturik daude, eta esplorazio-, azterketa-, aurkikuntza- eta ohartze-prozesu egituratu bat garatzea eskatzen dute. Dinamikoa, berriz, ikaskuntza-prozesua esperimentazio fisiko-birtualean oinarritzen delako; honetarako, bi irakats-ikas baliabide aurreikusten dira: bata, *Frontoia* izendatu den tresna fisiko eramangarria, eta bigarrena, hiru dimentsioko modelizazioak gauzatzea ahalbidetzen duen Solid-edge softwarea. Bi tresna hauen aldi bereko erabilerarekin, kasu praktikoek planteatzen dituzten egoerak modelizatuz, ikasleriari errealitate espazialean kokatzen lagunduko zaiela uste da, ebazpen-prozesuaren nondik norakoak erabakitzeko lagungarria izanik. Estrategiaren zimenduak, berriz, Konstruktibismoaren teoria pedagogikoaren pedagogikoaren baitakoak dira. Teoria honen arabera, ezagutza pertsonen eta objektuen arteko elkarrekintzaren ondorioz eraikitzen da (Piaget), eta subjektuak objektu bat eraldatzen edo-eta eraikitzen esperimentatzen duen jarduera baten baitakoa bada ikaskuntza esanguratsuagoa da (Seymour Papert). Laburbilduaz, ingeniaritza alorreko egoera errealen ebazpena izanik markoa, proposatzen den irakaskuntza-metodologiaren funtsa esperimentazio fisiko eta birtuala uztartzean datza. 2019-2020 ikasturtean, aldi berekoak izango dira irakaskuntza-metodologia tradizionala eta hemen proposatzen dena. Hortaz, emaitzak aztertu eta ondorioak ateratzeko aukera emango du, bai eta aurrerantzean estrategiaren diseinuan gehikuntzak nola hobekuntzak txertatzeko ere.

Abstract

The marks obtained in dihedral system within the course of Graphical Expression taught in the first course of engineering grades in the School of Engineering, Gipuzkoa, have been poor lately. The profile of the students could be a reason. They have difficulties in the interpretation and visualization of the tree dimensional space by traditional methods. Since the spatial vision is the key for the formulation and solution of all situations represented by dihedral system, the aforementioned difficulty hinders the obtaining of good marks. In front of this situation, the faculty has decided to make changes in the teaching-learning activity. To obtain a stronger and more motivating learning process, an innovative educational strategy has been designed. The base of the strategy is the Cooperative and Dynamic Learning

(IKD) pedagogical model of UPV/EHU, which is realized in the active methodology of Problem Based Learning. Cooperative, because cooperative activities have been defined to work with the theoretical foundations. The activities are designed to favor a deductive process by a structured process of analysis, discovery and understanding. Dynamic, because it is based on physical-virtual experimentation. For this, two teaching-learning tools have been foreseen. One is a physical portable tool, called Frontoia, and the other is the three dimensional CAD software Solid Edge. The simultaneous use of these two tools to model the situations set out by the practical cases is believed to help students locate in the spatial reality and decide the resolution process. The foundations of the strategy, in turn, are aligned with the pedagogical theory of constructivism. According to this theory, the knowledge is acquired as a result of person-object interaction (Piaget) and the learning is more significant when it is acquired as a result of an experiment based on the manipulation or construction of an object (Syemour Papert). In summary, the key of the proposed teaching methodology is to combine physical and virtual experimentation. In 2019-2020 academic year the traditional and the here exposed methodology are going to be simultaneous. It will give the chance to analyze and compare the results as well as to perform improvements in the strategy design.

1. Sarrera

Artikulu honetan, Ingeniaritza Industrialeko graduetako lehenengo mailako Adierazpen Grafikoa I enborreko irakasgaiaren lehenengo lauhilabeteko irakats-jarduna aldatzea eragiten duen proposamen didaktikoa aurkezten da. Irakasle taldea jakitun da ikasleen kalifikazioak nabarmen jaitsi direla azken ikasturteetan. Arazo honen arrazoi nagusia ikasleen ikusmen espazialaren garapen urria dela uste da. Ikusmen espaziala irakasgairen konpetentzia nagusia da eta garapen-prozesu baten bidez eskuratzen den gaitasuna da. Irakaskuntza-metodologia tradizionalek, memorizazioan oinarritzen diren irakaskuntza-ikaskuntza prozesuak direnez, ez dute eskaintzen lanketa egokia. Era berean, bigarren kausa bezala, irakasleria ikusmen espazialaren garapena bultzatzeko baliabide gabe dagoela identifikatu da.

Autore ezberdinen aburuz [1-3], objektuekin jardutea ikusmen espaziala garatzeko modurik eraginkorrena da. J.A. Tristando eta kolaboratzaileen ikerketaren arabera [4], gaitasun espazialaren garapeneko hastapen-faseetan, objektu fisikoen bidezko interakzioa da metodorik eraginkorrena. Erdi-mailako faseetan, aldiz, CAD software bidezko interakzioa proposatzen da, software hauek ariketa mota ezberdinen diseinu azkarra ahalbidetzen dutelako eta ikasleriaren motibazioa hobetzen dutelako. Irakaskuntza-metodo tradizionalaren bidez oso mugatua dago ikasleriak objektu errealekin duen interakzioa eta, intentzionalki ez bada ere, memorizazio bidezko ikaskuntzara bultzatzen da ikasleria [5]. Iritzi dugu ikaskuntza mota honen bidez ez dela edukien barneratze sakona lortzen, egoera errealen kontzientzia-maila oso baxua ahalbidetzen baitu. Irakasgaiko kasu eta ariketa guztiek testuinguru ezberdina aurkezten dutenez, ezinbestekoa iruditzen zaigu oinarri teorikoen barneratze esanguratsu bat lortzea, ebazpen-prozesuen zergatia ulertu eta kasu bakoitzera egokitutako pausoak irizpide egokiz aukeratzeko.

2. Metodologia

Gaitasun espazialaren garapenerako interakzio bidezko esperimentazio-prozesuak diseinatu dira. Errealitatea berreraikitzeak ikusmen espazialaren gaitasunaren garapena ahalbidetzen du, eta, honenbestez, kasuek planteatzen duen egoeraren ulermena areagotu. Esperimentazio prozesu hauek aurrera eraman ahal izateko, irakats-ikas baliabide berriak sortzea proposatzen da: alde batetik, ikasleriaren esku errealitate tridimentsionalarekiko interakzioa ahalbidetzen duten erremintak jartzea; bestetik, esperimentazio bidezko ikaskuntza bultza-

tzeko, IKD ereduan oinarritutako jarduera kooperatiboen bidezko irakaskuntza-ikaskuntza prozesuak ezartzeari zutarri deritzogu, hauen funtsezko ezaugarriak baitira ikerkuntza-esperimentazio izaera eta ikasleriaren elkarrekintza. Jarduera hauen bitartez, oinarri teorikoak modu deduktibo batean eta aurkikuntzaren bidez landuko lirateke, eta ondorioz, ariketa eta problemen ebazpenerako oinarri sendo bat sortuko litzateke, eta irakasgaiaren konpetentziak garatzen lagunduko. Laburbilduz, estrategia didaktikoaren oinarriak ondorengoak dira:

1. Esperimentazioan oinarrituriko irakaskuntza-ikaskuntza metodologiak.
2. Arrazoinamenduan oinarrituriko prozesu deduktiboak inplikatzen dituen ikaskuntza-jarduerak.
3. Ikasleen arteko elkarrekintzan oinarrituriko lana.

3. Emaitzak

Proposamen berritzailea bi jarduketa-esparrutan oinarritzen da: batetik, irakats-ikas baliabide berrien sorkuntzan, eta, bestetik, irakaskuntza-ikaskuntza jardunaren aldaketan. Azken hau jarduera kooperatiboen bidezko edukien lanketan oinarritzen da. Diseinatu diren baliabide didaktikoak ondorengoak dira:

1. *Frontoia* tresna fisikoa eramangarri eta modularra. Pieza finkoak sistema diedrikoa oinarri duten proiekzio planoak lirateke, eta mugikorrak, funtsezko zuzen eta plano elementuak.
2. Ebatziriko jarduera kooperatiboak: Oinarri teorikoak ulertu eta barneratzeko bikoteka landu beharrekoak. Tresna fisiko eta birtualaren erabilera behartuko dute, eta oinarri teorikoaren ulermen-maila neurtzeko galdera multzo bat bilduko dute.
3. Jarduera kooperatibo-esploratzaileak: Oinarri teorikoak ulertu eta barneratzeko bikoteka landu beharrekoak. Tresna fisiko eta birtualaren erabilera behartuko dute, eta ikasleari prozesu deduktibo bat egitea eskatzen dion urrats ezberdinez osaturiko egitura edukiko dute.
4. Kasuak: Ingeniaritzaren alorrean sortzen diren egoerak jasotzen dituzten enuntziatuak. Tresna fisiko eta birtualaren erabilera behartuko du, eta bakarka nola bikoteka ebaztera bideraturikoak izango dira. Oinarri teorikoak ikasleak egoki identifikatu eta interpretatzen dituen neurtzeko galdera multzo bat bilduko dute.

3.1. Ezarpen-etapa

2019-2020 ikasturtearen 1. lauhilekoan Ingeniaritza Industrialeko Graduko bi taldetan eta Ingeniaritza Zibileko Graduko talde batean ezartzea aurreikusten da. Eskolak irakaskuntza-metodologia tradizionalean hartuko dituzten ikasle taldeak ere egongo direnez, aurreikusten da ikasturtea amaitzerakoan alderaketa-azterketa bat egitea. Honetarako, ikasle talde guztietan, ikasturte hasieran, ezagutza-maila identifikatzeko galdetegia pasatuko da. Ikasturtean zehar, hirutan, edukien froga bat gauzatuko da estrategia didaktikoaren egokitasun eta eraginkortasuna ebaluatzeko.

Aurreikusten den emaitza irakasgaiaren irakaskuntza-gidan azaltzen diren ikaskuntza-emaitzen hobekuntza da:

1. Sistema diedrikoaren oinarri teorikoen ulermena.
2. Ebazpen-prozesuen zuzentasuna.

3. Elementuen artean sortzen diren erlazio eta posizio geometrikoen identifikazio eta interpretazio zuzen eta egokia.

Honek, ezinbestean, irakasgaiaren ondorengo gaitasun espezifikoen eskuratze-mailaren sendotzea eragingo luke:

1. Ikusmen espazialerako ahalmena.
2. Errealitatea bi dimentsiotan adieraztea, geometria deskribatzaileko sistemen bidez.
3. Ingeniaritza Industrialaren alorrean sortzen diren egoerak sistema diedrikoaren bidez ebaztea.

Aldi berean, eta soilik irakaskuntza-metodologia berria ezartzen ari den ikasle taldeetan, jarduera kooperatiboen diseinua ebaluatzeko, foroen bidezko talde-mailako eztabaida-saioak gauzatuko dira, indargune/ahulguneak identifikatu eta hobekuntzak txertatzeko.

Eskertzeak

Autoreek UPV/EHU eskertu nahi dute, *Adierazpen Grafikoaren Irakaskuntza, Ikaskuntza Esperimentalaren bidez* proiektua 2019-2020 Hezkuntza Berrikuntza Proiektuen deialdian garatzeko emandako aukeragatik, eta L. Ugarte eta I. Gonzalez-Gurrutxaga autoreek, GAITUZ 2019 deialdian emandako dirulaguntzagatik.

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Las TIC como herramienta educativa innovadora en la conservación de Patrimonio Artístico Catalogación y difusión de la Colección de la Universidad del País Vasco

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Resumen

La presente propuesta se contextualiza en el Grado en Conservación y Restauración de Bienes Culturales de la Universidad del País Vasco y plantea una metodología didáctica que impulsa el empleo de las TIC en el estudio y conservación de la colección de arte de la UPV/EHU.

Se posibilita así, la adquisición de las competencias digitales propias de la titulación al tiempo que los estudiantes trabajan e interiorizan de forma activa y significativa la utilidad de las nuevas tecnologías en las tareas propias de la conservación de patrimonio, aplicándolas a la catalogación, digitalización y difusión de las obras conservadas en la Universidad. La implementación de la propuesta hace que las TIC se conviertan en una herramienta ineludible para el estudio de las obras de arte, facilitando el aprendizaje de manera práctica y teórica al tiempo que aporta ventajas para su evaluación *in situ*. Se contempla así el uso de recursos tecnológicos durante el proceso formativo, así como que éstos se conviertan en un medio de conservación pasivo en tareas de documentación y registro.

Abstract

This proposal contextualized in the Degree in Conservation and Restoration of Cultural Assets of the University of the Basque Country formulates a didactic methodology that motivates the use of ICTs in the study and conservation of the art collection of the University. The design seeks the acquisition of the digital competences of the degree meanwhile the students work actively and meaningfully internalizing the usefulness of new technologies in the tasks of heritage conservation, applying them into the cataloging, digitization and dissemination of the works preserved in the University.The implementation of the proposal makes ICTs an unavoidable tool for the study of works of art, facilitating the learning process in a practical and theoretical way while providing advantages for on-site evaluation. In this way, the use of technological resources during the training process is foreseen and, additionally, these technologies become a mean of passive conservation through documentation and registration tasks.

1. Introducción

Uno de los retos a los que se enfrentan los futuros conservadores/as de patrimonio es la adaptación a las nuevas metodologías de investigación y restauración que implican, entre otras cuestiones, el uso de las TIC.

Su uso en la investigación y difusión de temas relacionados con la educación y la protección del patrimonio ha sido ampliamente documentado (Fontal e Ibáñez-Etxeberria, 2015; Ibáñez-Etxeberria, Fontal y Rivero, 2018; PH, 2003; etc.) y su aplicación sigue evolucionado imparablemente.

Actualmente las nuevas tecnologías permiten llevar a cabo protocolos de estudio, análisis y diagnóstico que benefician la preservación de las obras, convirtiéndose en un me-

dio de conservación pasivo mediante su documentación y registro. El fenómeno conocido como *citizen science* ha impulsado el uso de diferentes dispositivos favoreciendo la investigación y el desarrollo de aplicaciones cada vez más efectivas para su utilización en patrimonio (Bearman, Doehne, Voss *et al.*, 2013; Ma, Walton, Cossairt *et al.*, 2015; Wess, 2017).

Su empleo es cada vez más habitual en museología, museografía o conservación de arte (Frost &Towers, 2015; Lodeiro-Santiago & Soto-Martín, 2015) y, ciertamente, en educación para desarrollar aspectos competenciales específicos y transversales relacionados con cualquiera de esos ámbitos. La UPV/EHU cuenta, con la existencia de un escenario que permite desarrollar y trabajar dichas competencias paralelamente: una auténtica colección de arte contemporáneo que conservar y difundir.

2. Objetivos

La propuesta se centra en la implementación de las TIC para el estudio y difusión de las obras de la colección de patrimonio artístico de la UPV/EHU, facilitando la adquisición de las competencias digitales tanto transversales como propias del campo de la conservación de arte.

3. Metodología

La metodología plantea una secuencia de tareas y resultados derivados, que implican el empleo diferentes recursos y TICs para el estudio de las obras de la colección (*Tabla 1*).

Tabla 1
Secuencia de tareas y TICs propuestas

	Tarea	Entregables y TICs	Resultados de aprendizaje
Fase 0	Dinámica del equipo	Ficha de equipo: OpenOffice™, Drive, Dropbox, etc. Calendario de trabajo: Doodle, Google Calendar, Trello	Normalización de herramientas para la gestión eficaz y dinámica de los recursos de trabajo-tiempo.
Fase 1. Inventario y búsqueda de referentes	Evaluación tipológica e inventariado	Inventariado: Libre Office Calc Ficha tipológica: OpenOffice™	Normalización y manejo de procesadores de texto y hojas de cálculo.
	Búsqueda de referentes	Recopilación de recursos web (museos, páginas web, blogs y redes sociales…) y modelos de catalogación: Domus, Ensime, etc.	Búsqueda crítica y clasificación de la información de los recursos disponibles en internet. Conocimiento de bases de datos, páginas web institucionales y blogs de referencia

	Tarea		Entregables y TICs	Resultados de aprendizaje
Fase 2. Catalogación y análisis de conservación de las obras de arte	Identificación y documentación		Informe de conservación: OpenOffice™	Registro de datos y catalogación de fondos para su conservación
	Estudio y registro del estado de conservación		Documentación fotográfica (equipo fotográfico digital, fuentes de iluminación, tablet Documentación complementaria (apps lupas digitales, microscopio digital portátil…) Mapeo de deterioros: apps y programas de software libre sketch, adobe Ilustrator Draw, Inskape, Gimp o similares.	Normalización y manejo de medios utilizados para el registro gráfico, fotográfico y documentación del estado de conservación.
	Control de condiciones		Registro de medidas: Apps luxómetro, higrómetro y termómetro	Adquisición de las bases teóricas de la Conservación Preventiva. Obtención de las bases para el registro de datos mediante el empleo de TICs.
	El/la artista: contacto y registro		Contacto con el artista (email, Facebook, Instagram, LinkedIn, etc.) Transcripción y registro de la entrevista (texto, grabadora o cámara del teléfono, transcripción automática, etc.)	Clasificación y registro de la información mediante entrevistas e interiorización de la importancia del artista en la conservación de arte contemporáneo.
	Propuesta de intervención y medidas de conservación		Propuesta justificada: Openoffice™, Libre Office	Capacidad de análisis e interpretación de datos y resolución de problemáticas de conservación. Capacidad para proponer intervenciones justificadas y argumentadas.
Fase 3. Difusión	Base de datos de la colección		Base de datos y Edición de informes y fichas catalográficas: File Maker Pro	Conocimiento y manejo de herramientas empleadas en museos, galerías e instituciones para registro y gestión de colecciones.
	Presentación de resultados		Presentación de resultados: Impress, Prezzi, videos, etc.	Capacidad para exponer resultados de una investigación empleando recursos audiovisuales y programas de presentación
	Visualización y difusión de los resultados		Visualización resultados: página web UPV/EHU, redes sociales, blogs, revista digital Campusa.	Normalización y manejo de medios y redes para la difusión y visualización de resultados
	Visibilización de las obras en el campus		Diseño: cartelas y códigos QR	Normalización y conocimiento de medios tradicionales e innovadores para la interpretación de patrimonio.
Fase 4. Evaluación	Alumnado	Entregables	E-gela (Moodle) en PDF	Normalización del empleo de TICs para la evaluación de competencias y optimización de procesos de trabajo.
		Auto/ coevaluación	Encuestas online/ formularios google	
	Metodología	Focus Group	Acta FocusGroup: Almacenamiento compartido	Empleo de herramientas de valoración cualitativa

4. Resultados y conclusiones

Consideramos que el empleo de las TIC para el desarrollo y obtención de las capacidades y competencias profesionales y educativas es esencial y al mismo tiempo se constituyen como una herramienta inestimable para el estudio y la conservación de obras de arte de un modo innovador y actual.

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Exploring the Role of the Instructional Skills Workshop (ISW) in Shaping "Backstage" Conversations about Teaching

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Abstract

Since 2015, our institution (a Canadian university) has been engaged in a five-year international partnership with a Caribbean community college. A central component of this partnership is a faculty development program set to building capacity and teaching skills at the college, through the provision of an internationally recognized professional certification program known as the Instructional Skills Workshop (ISW). The ISW is designed to enhance the teaching effectiveness of both new and experienced educators, by strengthening content delivery skills and cultivating student-centered teaching practices (ISW Network, 2019).

While the ISW has trained thousands of post-secondary instructors globally, research on its impact on teaching practice and on its sustainability over time has been limited (Dawson *et al.*, 2014). In order to address the need for more evidence on the impact of the ISW, semi-structured interviews were conducted with twelve faculty members from the college who were enrolled in the program. In these interviews they shared their approaches to teaching, their experience as an ISW participant, and the potential application of the ISW to their teaching practice.

Informed by research on conversations that occur in the "backstage of teaching" (Roxå & Mårtensson, 2009) as well as what Friberg (2016) describes as a new 4M Framework for SoTL (micro-individual; meso-department; macro-institution; mega-beyond institution), this presentation explores the capacity of the ISW to foster an institutional culture of teaching and learning. Our research found that participation in the ISW can encourage the development of supportive cohorts of instructors, that discuss and even hold one another accountable for implementing practices from the ISW in their classrooms. Our findings also indicate however that these conversations often do not transcend the "meso" level, and are confined to pre-existing networks of departmental colleagues who have taken the ISW together.

As a widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement. This session will invite participants to share their experience with similar faculty development programs, and initiate a broader discussion on how such programs can foster "backstage" conversations about teaching.

1. Introduction

Recent scholarship has attended to the increasing prevalence of internationalization initiatives in higher education and the motivations that underlie this shift at the institutional level (Altbach & Knight, 2007; Brandenburg & de Wit, 2015; Daniels, 2013; Qiang, 2003). Educational development is not immune to the pressures of internationalization, and developers from institutions with established faculty development programs are increasingly being invited to share their expertise with emerging higher education institutions (Lee *et al.*, 2013). Although the involvement of educational developers in international partnerships to enhance teaching and learning is becoming more commonplace, these initiatives are not well reported in the academic literature (Willis & Strivens, 2015).

In line with this move toward international educational development partnerships, McMaster University, a mid-sized, research-intensive Canadian university, has prioritized

internationalization within the University's academic and research missions, including its support for educational development and enhancement. In 2014, a collaborative partnership was proposed between McMaster University and the PETNA Foundation (a charitable organization founded by Nicholas and Janice Brathwaite) to establish the Braithwaite International Partnership. Formalized and initiated in 2015, the Braithwaite International Partnership focuses on bringing positive change to the lives of young people in Grenada through the power of higher education. To realize this goal, funding has been dedicated to a series of initiatives developed collaboratively between four partners: the Government of Grenada, the PETNA Foundation, McMaster University, and T.A. Marryshow Community College (TAMCC), Grenada's principal tertiary institution with an enrollment of 2,300 students, of whom approximately 10% are adult learners.

In 2015, a comprehensive needs assessment report was conducted by McMaster University at TAMCC. The report identified five main areas necessitating further development and enhancement: leadership, faculty development, curriculum and quality assurance, student partnership and engagement, and infrastructure for a learning commons. Responding to the findings of the needs assessment, a strategic plan was developed to facilitate the implementation of best practices in teaching and learning through training programs, professional development opportunities, retreats, and international exchanges with the goal of transforming TAMCC into the leading tertiary institution in the region.

Following the report and informed by the needs it identified, educational developers from McMaster University first travelled to Grenada in November 2016 to focus on building capacity and teaching skills with faculty through the provision of an internationally recognized, 24-hour training course and certification program known as the Instructional Skills Workshop (ISW). The ISW is a comprehensive teacher development program designed to enhance the teaching effectiveness of both new and experienced educators, strengthen teacher capacity and delivery skills, foster institutional dialogue and collaboration on teaching and learning, and cultivate student-centered teaching and learning practices (ISW Network, 2019). The ISW has become one of the central components of the faculty development program within the broader Brathwaite International Partnership, and to date 89 instructors at TAMCC have been certified after completing the ISW.

While the ISW has now been incorporated into the faculty development programs of most Canadian universities (including McMaster), and has trained thousands of post-secondary instructors globally, research on its impact on teaching practice and on its sustainability over time has been limited (Dawson *et al.*, 2014; MacPherson, 2011). As a widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement (Bamber & Stefani, 2016; Kenny *et al.*, 2017).

In order to address the need for more evidence on the impact of the ISW, semi-structured qualitative interviews were conducted with twelve faculty members from the college who were enrolled in the program. The interviews aimed to elicit a richer, more nuanced understanding of the long-term impact of the ISW on participants' professional development and approaches to teaching. Informed by research on conversations that occur in the "backstage of teaching" (Roxå & Mårtensson, 2009) as well as what Friberg (2016) describes as a new 4M Framework for SoTL (micro-individual; meso-department; macro-institution; mega-beyond institution), this paper explores the capacity of the ISW to foster an institutional culture of teaching and learning.

2. Methods

In May 2017, an email was sent out by administrators at TAMCC to all faculty who had not completed the ISW during the initial offering of the ISW in Fall 2016, inviting them to express their interest in participating in the training and to complete an application in order to be considered. The Faculty Development Committee at TAMCC reviewed the applications, and selected participants based on their years of experience teaching and the type of courses taught, with an eye toward workshops consisting of instructors with a range of disciplinary backgrounds and teaching experience. Successful applicants were enrolled in ISW sessions held in both June and August 2017 (n = 33).

At the end of these workshops, participants were invited to provide their consent to be contacted for a follow-up interview approximately seven months after completion of the ISW, to further discuss the longer-term impact of the ISW on their teaching. All 33 instructors who were in the June and August 2017 ISW cohorts were invited to participate in the interviews, and of those contacted, 12 instructors were interviewed at the main campus of TAMCC in Grenada in March 2018. The interview questions were semi-structured, allowing for an informal and open-ended conversation on the perspectives of instructors at TAMCC on the impact of the ISW on their professional development. Questions explored in particular their teaching experience at TAMCC and prior faculty development opportunities; their motivations for participating in the ISW; what they perceived to be the benefits and limitations of the ISW; the impact (if any) of the ISW on their teaching practice, on student learning, and in their work with colleagues and students; and the applicability of the ISW to their educational context.

The interviews were held in a private room on the TAMCC campus and were approximately 1 hour in length. All interviews were conducted by the lead author and later transcribed verbatim for subsequent analysis. A qualitative data analysis software program (NVivo) was used to thematically code the interview transcripts and to examine relationships in the data. This research was reviewed and cleared by the Research Ethics Board at McMaster University, conforming to standards of ethical conduct in research involving human participants.

3. Results

Frequency analysis of the interview transcripts indicated a prevailing consensus among participants that the ISW was highly beneficial to their teaching development, even transformative, and that there was a level of excitement regarding the potential long-term benefits of their involvement in the program. Regarding motivations for participating in the ISW, some referred to their desire to take the workshop as an opportunity to become more "professional." They described feeling that they did not have sufficient faculty training and that the ISW, as a certified and internationally recognized workshop, would enable them to incorporate best practices in the classroom and to become more confident in their teaching ability after acquiring an additional credential.

Regarding changes in their teaching approach, directly translated into the classroom from the ISW, several indicated that they had shifted away from traditional "chalk and talk" approaches and incorporated more active components into their classes, and observed that this had a significant and positive impact on their students. They perceived that students were more interested in the course content and more engaged, and in some cases performing better on assessments. They related anecdotes that students had become more confident

and open, that they didn't try to become "invisible" in the classroom as much as they used to, and were asking more questions. From the perspective of several of the instructors interviewed, they sensed that students had a greater sense of agency in the classroom, as well as responsibility for their learning.

Instructors from TAMCC who participated in the ISW did express concerns regarding the workshop however. While several participants spoke of what they had learned regarding incorporating more educational technology into the classroom, they also expressed frustration that some of the ISW lessons did not reflect the actual context of TAMCC, particularly in regard to limited technological resources and support. Some also suggested they found the ISW to be too intensive, and requested a more graduated process toward becoming certified. Several recommended that the partnership develop a more sustained, ongoing development framework, such as an extended faculty development series, with a wide-range of workshops and lessons, complemented by ongoing individual support.

In line with this, instructors shared that participation in the ISW could encourage the development of supportive cohorts of instructors, that discuss and even hold one another accountable for implementing practices from the ISW in their classrooms, however these conversations are often confined to pre-existing networks of departmental colleagues who have taken the ISW together, and are limited in their reach. It is worth exploring these perspectives on the impact of the ISW in fostering instructor cohorts, and the ways it can and cannot influence a broader teaching culture, in more detail below.

3.1. The ISW as Catalyst for "Significant Conversations" about Teaching

A common theme threading across the interviews was the importance of the ISW cohort, the community that is established among the colleagues that took a specific ISW together, in sustaining the application of strategies learned in the workshop to the classroom. Several noted that they now check-in regularly with colleagues that were in the same ISW about their teaching, regarding which components from the ISW they're incorporating into their classroom, which they're not, in a way that is supportive and collegial but which also holds one another accountable for translating the ISW into their teaching practice. As one instructor described it:

> "Amongst us who have done the ISW, I find that we ask each other, 'What are you using? How is that working for you?' I've known persons who teach more practical things and they're trying to ask others, 'How does it work in a practical lesson for you?' So, I think there's communication, people are sharing ideas. Sometimes when I'm walking with my flip charts, my coworkers will say, 'You're using one of the things you learned in the ISW today.' That kind of thing." (P10)

Echoing the above comment, others noted the informal, almost organic nature in which these networks or cohorts develop. As another instructor observed: "From time to time we engage in that sort of discussion, informal discussion. I believe that a lot of things can be learned in an informal discussion with colleagues" (P4). Instructors appreciated the ways in which these informal conversations, amongst networks of trusted colleagues who had taken the ISW together, allowed opportunities for sharing their adoption of teaching strategies in the classroom and lessons learned, and even to hold one another accountable. Several noted that there had been a palpable shift in the way instructors talked about their teaching with colleagues since taking the ISW. Some observed however that despite this shift, instructors

can be very protective of their classes, stating that "We don't want other persons to know what we're doing, because we don't want to be judged. We're still a bit closed" (P3).

3.2. Departmental Affiliation and the ISW Cohort Model

Following this sentiment that "we're still a bit closed," some instructors observed that while the ISW had been beneficial in fostering conversations about teaching, only a small circle of people within the 150 teaching staff at TAMCC had completed the ISW, and that for the workshops to have a sufficiently broad impact more, if not all instructors at the college needed to be trained. One instructor made this call explicitly:

> "I would encourage them [administrators at TAMCC] to hurry up and have the other people involved in the ISW because in my little circle not every member has had that experience yet. So then, sometimes when I will talk some people only kind of contribute because they don't have the experience. So there's some excitement for those who have not yet experienced it. So we need to get everybody on board, because now it's like a club, a Club ISW [laughs]. But we talk about it. All of us, we talk about it." (P1)

This sentiment is echoed by another instructor, speaking to the ways in which informal conversations about teaching have remained confined to those that have taken the ISW:

> "So we do exchange ideas, to see what works for this person and they could probably start doing…so we do exchange. But it's from persons who have got the same training and they work within the same department as I am, so it's limited in that way. But we do exchange ideas." (P7)

Here, in addition to pointing to conversations about teaching staying largely within the ISW cohort, the idea of departmental affiliation being a significant factor in further bounding these conversations is introduced. As noted in the introduction to this paper, instructors were recruited for the ISWs by administrators at TAMCC with an eye toward developing cohorts of trained instructors with a broad cross-section of teaching experience and disciplinary expertise, in order to extend the potential impact of the workshop in fostering interdisciplinary collaboration and transforming the institutional teaching culture. Some instructors noted however that their ISW cohorts were clearly defined by the departmental affiliations of the participants, which often limited opportunities to learn from others teaching in similar contexts. As one instructor stated:

> "I'm the only one from my department who did it so it was difficult to interact with the people there. I'm the only one who did it. I didn't get a chance to interact with the other lecturers and see how it really helped us. The next time it comes around, I want at least 5-6 lecturers in my department to take the ISW. I know it's going to help us and it's going to improve the department, and the college." (P6)

4. Discussion

Our research on the experience of instructors at TAMCC who have taken the ISW supports the findings of the existing (albeit limited) body of literature on the ISW that points

to its significant and, at times, even transformational capacity to enhance teaching practice (Dawson *et al.,* 2014; Foxe, Frake-Mistak & Popovic, 2017; MacPherson, 2011). There was broad consensus among instructors that the workshop had instilled greater confidence in their professional approach to their teaching, and had equipped them with the tools needed to experiment with lesson planning tools, active learning strategies and other student-centred teaching methods, and to incorporate the use of educational technology where possible.

In addition, they also frequently described conversations with peers in their ISW cohort following participation in the workshop in terms closely analogous to what Torgny Roxå and Katarina Mårtensson refer to as "significant conversations" with trusted colleagues about teaching, that form a basis for conceptual development and learning. They suggest that these conversations often occur privately and informally within the "backstage" of teaching, as opposed to more formal, public, and facilitated "front stage" conversations (Roxå & Mårtensson, 2009). As noted above, instructors at TAMCC often described their post-ISW conversations with fellow workshop participants in this way, highlighting the value of learning from colleagues through informal conversations about teaching, sharing tips and tricks with one another, what's working in their classroom, and what isn't.

Yet the capacity of the ISW to foster significant conversations about teaching was, at least within the context of TAMCC, limited when the ISW cohort lacked disciplinary cohesion and when, for some instructors at least, they were the only members of their department participating in the workshop, and felt a sense of isolation as a result. This in turn constrained their ability to share with their colleagues what they had learned in the workshop, when they lacked the shared experience and language of the ISW cohort. This is perhaps to be expected given how professional identities can be so strongly shaped by departmental or disciplinary structures, assumptions, and practices (Becher & Trowler, 2001; Trowler & Cooper, 2002).

It is important then in offering the ISW to attend to the "Meso" or departmental level of Friberg's 4M framework (Friberg, 2016), and the ways in which departmental or disciplinary affiliation can determine the sustainability of the ISW in teaching practice. Sustainability and long-term impact is of course important for any faculty development initiative, but particularly so within the context of international educational development partnerships, given the often inherent logistical challenges, time constraints, and what Bovill *et al.* provocatively describe as "the illusory nature of transformed practice" (Bovill, Jordan & Watters, 2015: 16).

Informal conversations about teaching that occur among trusted colleagues (particularly with a shared disciplinary identity) in the "backstage" of educational contexts are often highly valued by instructors who have taken the ISW. They can be a means of sharing, solidarity, and accountability. Our findings have shown however that for some instructors, there is a need for additional faculty development opportunities to sustain and reinforce content from the ISW, and to perhaps formalize these significant conversations about teaching, both within the ISW cohort, but also within departments.

One response to this need is the development of Communities of Practice (CoP), groups of people with a shared concern, passion, or profession, who meet and interact regularly to share information and experiences, and to develop personally and professionally (Wenger, 1998; Wenger, McDermott & Snyder, 2002). A hybrid approach that is both nurturing and supportive of personal development, but also intentional in its alignment to broader institutional priorities (McDonald *et al.,* 2012; Oliver & Watson, 2017), may be effective in fostering continued conversations and development amongst the ISW cohort, and provide support for those who might feel the ISW itself was too intensive, or insufficient. As a

widely-used professional program for faculty development, it is important to assess the efficacy of the ISW as a potential catalyst for broad and sustainable teaching enhancement, and complementing the existing workshop with ongoing Communities of Practice may be one way to ensure its longer-term sustainability.

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Contribuciones de la analítica del aprendizaje a la implicación de los estudiantes de enseñanzas científico-técnicas

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Resumen

En las enseñanzas universitarias y, más particularmente, en las titulaciones científico-técnicas, es habitual el uso de entornos digitales para dar soporte al aprendizaje. se entiende como tales las típicas plataformas (lms) como moodle o sakai, pero también los numerosos entornos utilizados en ingeniería para aprender a programar o a diseñar sistemas electrónicos digitales, por citar dos ejemplos. Una de las principales ventajas de estos sistemas es que la interacción de los estudiantes con los mismos proporciona una "huella" de su actividad que se puede registrar. La recopilación y posterior análisis de los datos generados se engloba en las técnicas de analítica del aprendizaje (*learning analytics*).

En este trabajo se plantea estudiar cómo el uso de estas técnicas ayuda a conocer muchos aspectos de los procesos de aprendizaje, lo que podría contribuir a mejorar la implicación del estudiante. Para ello, en cada uno de los contextos de aplicación, primero se seleccionan los indicadores o fuentes de datos que serán objeto de análisis, tales como: acceso a recursos didácticos, entrega de tareas y su relación con los plazos fijados, realización de cuestionarios y sus resultados. Dependiendo de los entornos empleados también se podría utilizar información mucho más específica, por ejemplo: tiempo empleado en la realización de las actividades, porcentajes de progreso, actividades pendientes de realizar o, para el caso particular de determinados entornos de programación: intentos fallidos, errores cometidos en la ejecución, indicadores de calidad del código generado...

A partir del análisis de los datos recogidos, los profesores que gestionan estos entornos pueden obtener determinados informes, como típicamente sucede en los LMS. Sin embargo, para poder mejorar la autorregulación del aprendizaje, es imprescindible abordar la metacognición, informando al estudiante sobre su evolución, preferiblemente mediante visualizaciones efectivas de los datos. En este trabajo, además de mostrar ejemplos de las visualizaciones proporcionadas por los entornos utilizados, se describen también algunos *dashboards* diseñados específicamente para que los estudiantes tomen conciencia de sus propios logros. De este modo, se facilita la mejora en la implicación de los estudiantes y, consecuentemente, sus logros de aprendizaje.

Abstract

In the context of higher education and, more particularly, in stem-related degrees, it is common to use digital environments to support learning. In addition to the typical learning management systems as moodle or sakai, there are many other platforms frequently used in engineering to learn programming or digital electronic systems design, to give a couple of examples. One of the main advantages

of these systems is that the interaction of the students with them provides a "footprint" that can be recorded. The collection and subsequent analysis of the generated data are known as learning analytics techniques.

In this paper the main goal is to study how using these techniques can help to get some insight about learning processes, which could contribute to improve student involvement. To accomplish that, in each of the application contexts, firstly the indicators or data sources to be analysed, will be selected. For instance, access to learning resources, delivery of tasks and its relationship with the deadlines, or performance in completing questionnaires. Depending on the particular environments, much more specific information could also be used, for example: time spent to perform some activities, percentages of progress, remaining activities or, for the case of certain programming environments: failed attempts, errors committed in the execution, quality indicators of the generated code and so on.

Starting from the analysis of the collected data, instructors managing these environments can obtain certain reports, as typically happens in the LMSs. However, in order to improve self-regulation, it is essential to address metacognition, informing the student about its progress, preferably through effective data visualizations. In this work, in addition to show examples of the visualizations provided by the own environments, some specifically designed dashboards to make students aware of their own achievements are described. In this way, student engagement is fostered and, accordingly, learning outcomes are improved.

1. Introducción

Los estudios universitarios suponen, para un buen número de estudiantes, un importante reto, ya que deben afrontar la regulación de su esfuerzo en un entorno que les puede resultar bastante exigente. Además, es frecuente encontrar grupos relativamente numerosos, sobre todo en los primeros cursos, lo que dificulta, en gran manera, que los estudiantes puedan recibir una atención personalizada por parte de sus profesores.

Un reciente estudio (Pérez y Aldás, 2019, p. 81) indica que "un 33% de los alumnos españoles deja sin finalizar el grado en el que se matriculó, un 21% para abandonar la universidad sin obtener un título y el 12% restante para cambiar de estudios". El abandono es mayor en titulaciones técnicas (36% en ingeniería y arquitectura) y científicas (31%). Entre las diversas causas que podrían explicar estos niveles de abandono el estudio cita, entre otras, "un deficiente seguimiento de los alumnos y su bajo rendimiento académico 'por falta de capacidad, esfuerzo o motivación'".

El uso de entornos digitales para dar soporte al aprendizaje (*Interactive Learning Environments*) es habitual en las enseñanzas universitarias (Pazos, 2008) y, en particular, en las titulaciones científico-técnicas (*STEM: Science, Technology, Engineering and Math*). Se entiende como tales las típicas plataformas virtuales de aprendizaje (*LMS: Learning Management Systems*) como Moodle o Sakai, pero también los numerosos entornos utilizados en ingeniería para aprender a programar o a diseñar sistemas electrónicos digitales, por citar dos ejemplos. Estos entornos, además de ser usados masivamente en modalidades de aprendizaje on-line, sirven de soporte en la enseñanza presencial (*face-to-face*), ya que los estudiantes los pueden utilizar a su propio ritmo.

Una ventaja adicional de estos entornos es que la interacción de los estudiantes con los mismos proporciona una "huella" de su actividad, que se puede registrar. La recopilación y posterior análisis de los datos generados, supone una información valiosa sobre lo que realmente está sucediendo en el proceso de aprendizaje, facilitando a los educadores la propuesta de sugerencias de mejora (Long & Siemens, 2011). Este tipo de enfoques se asocia a las técnicas de analítica del aprendizaje (*learning analytics*), definidas por la *Society for Learning Analytics Research* (Ferguson, 2012) como "la medición, recopilación, análisis y presenta-

ción de datos sobre los alumnos y sus contextos, con el fin de entender y optimizar el aprendizaje y los entornos en los que se produce" (traducción libre de los autores).

Existen en la literatura diferentes trabajos que utilizan estas técnicas para relacionar la actividad de los estudiantes en los entornos digitales con su rendimiento académico. Por ejemplo, en (Agudo-Peregrina, Iglesias-Pradas, Conde-González, and Hernández-García, 2014), los autores encontraron, para el caso de los cursos on-line analizados, una relación entre las interacciones estudiante-estudiante y estudiante-profesor con el rendimiento académico. Sin embargo, en (Conijn, Snijders, Kleingeld, and Matzat, 2017) y tras analizar 17 cursos donde se utilizaba Moodle como soporte a la enseñanza presencial, concluyen que la bondad de los modelos de predicción de rendimiento académico varían mucho en función de los cursos, por lo que sugieren utilizar fuentes de datos adicionales a los del entorno Moodle.

Otras investigaciones se centran en identificar estrategias de autorregulación a partir de las interacciones de los estudiantes con los entornos de aprendizaje (Cicchinelli *et al.,* 2018). En sus resultados muestran que los indicadores observables introducidos pueden explicar mejor el comportamiento de autorregulación y su influencia en el rendimiento, que las evaluaciones subjetivas preliminares, para las que habían utilizado como instrumento el "Cuestionario de Estrategias Motivadas para el Aprendizaje" (Pintrich and De Groot, 1990).

El objetivo principal de este trabajo es explorar la aplicación de técnicas de analítica del aprendizaje para obtener información sobre los procesos de aprendizaje de los estudiantes, que permita mejorar la metacognición y, consecuentemente, la autorregulación. Para lograrlo, será fundamental transmitir la información a los propios estudiantes, preferiblemente mediante visualizaciones efectivas de los datos (Schwendimann *et al.,* 2017).

2. Desarrollo

Para este trabajo exploratorio se han tratado de elegir diferentes casos de estudio que sean representativos de enfoques bien distintos. Para ello, y siempre en el ámbito del aprendizaje de la Informática en la Universitat Politècnica de València (UPV), se han analizado desde asignaturas de primer curso hasta asignaturas de máster, que incluyen modalidades tanto presenciales (soportadas por entornos digitales de aprendizaje), como completamente *online*. Además, no solo se hace uso de los datos procedentes de los típicos LMS, sino que se incorporan también datos procedentes de otros entornos de aprendizaje.

Para los diferentes casos, la propuesta plantea dar respuesta a tres cuestiones:

1. ¿Cómo contribuir a mejorar las estrategias de autorregulación y la implicación del estudiante, empleando técnicas de analítica del aprendizaje?
2. ¿Qué entornos de aprendizaje utilizar y qué fuentes de datos/indicadores seleccionar?
3. ¿Cómo visualizar la información?

En los próximos párrafos se describen brevemente distintos casos de estudio, de acuerdo con el esquema propuesto.

2.1. Diseño y desarrollo de software

En este caso de estudio se utiliza el Portafolio Docente de Programación (PDP) como estrategia de aprendizaje en una asignatura de Informática de primer curso del Grado de

Ingeniería en Electrónica y Automática. El propósito es ayudar al alumno a autorregularse, tomando conciencia de su progreso en la adquisición de habilidades y competencias relacionadas con la programación. Se trata de proporcionar al estudiante una realimentación continua sobre su desempeño, a partir del análisis de los indicadores extraídos, de forma automatizada, de los datos generados en la realización de los códigos fuente de los programas que conforman los PDP, tales como test unitarios, intentos fallidos, tiempo empleado en la resolución de programas, líneas de código, tiempos de ejecución de programas, entre otros. Estos portafolios se crean a través de la herramienta PDPaaS (*PDP as a service*), la cual permite generarlos a través de entornos virtualizados (*IDE*, *Jenkins*, *Git-Hub* o *Git-Hub classroom*).

La visualización de los datos se realiza mediante los mismos entornos virtualizados en la nube, que permiten visualizar los indicadores a través de entornos gráficos. Por ejemplo, *Jenkins* puede mostrar los intentos fallidos de un programa desarrollado en un PDP, así como otros indicadores de calidad de código proporcionadas por *plugins* propios de la herramienta. La Fig. 1 muestra una captura de pantalla de *SonarQube*, un *plug-in* de *Jenkins*, que facilita información sobre el código fuente de un programa y los test unitarios.

2.2. Computación en la nube

En este ámbito resulta imprescindible la realización de actividades prácticas que involucren los principales servicios ofrecidos por un proveedor de *Cloud* público (como *Amazon Web Services-AWS*) para crear diferentes arquitecturas de aplicaciones. Estas prácticas constan de una serie de pasos que el estudiante no debe omitir. Llevar una trazabilidad de las acciones realizadas por los alumnos en *AWS* durante dichas actividades, y hacérselas visibles al propio alumno, posibilita que tome conciencia de su grado de progreso y de si ha omitido algunos de los pasos.

Figura 1
Dashboard que representa la calidad de un programa en Java

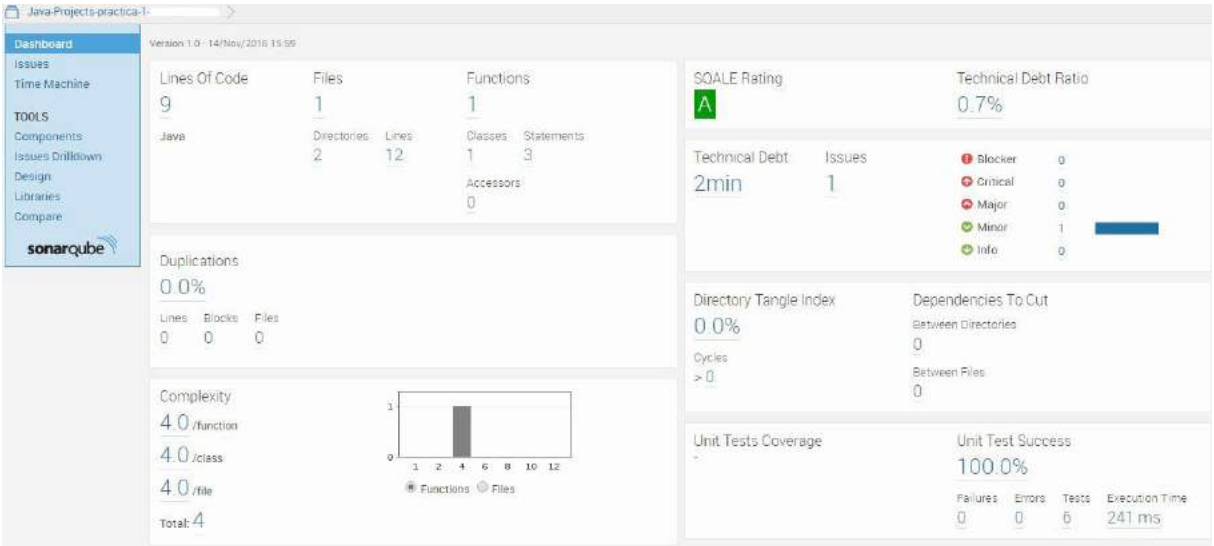
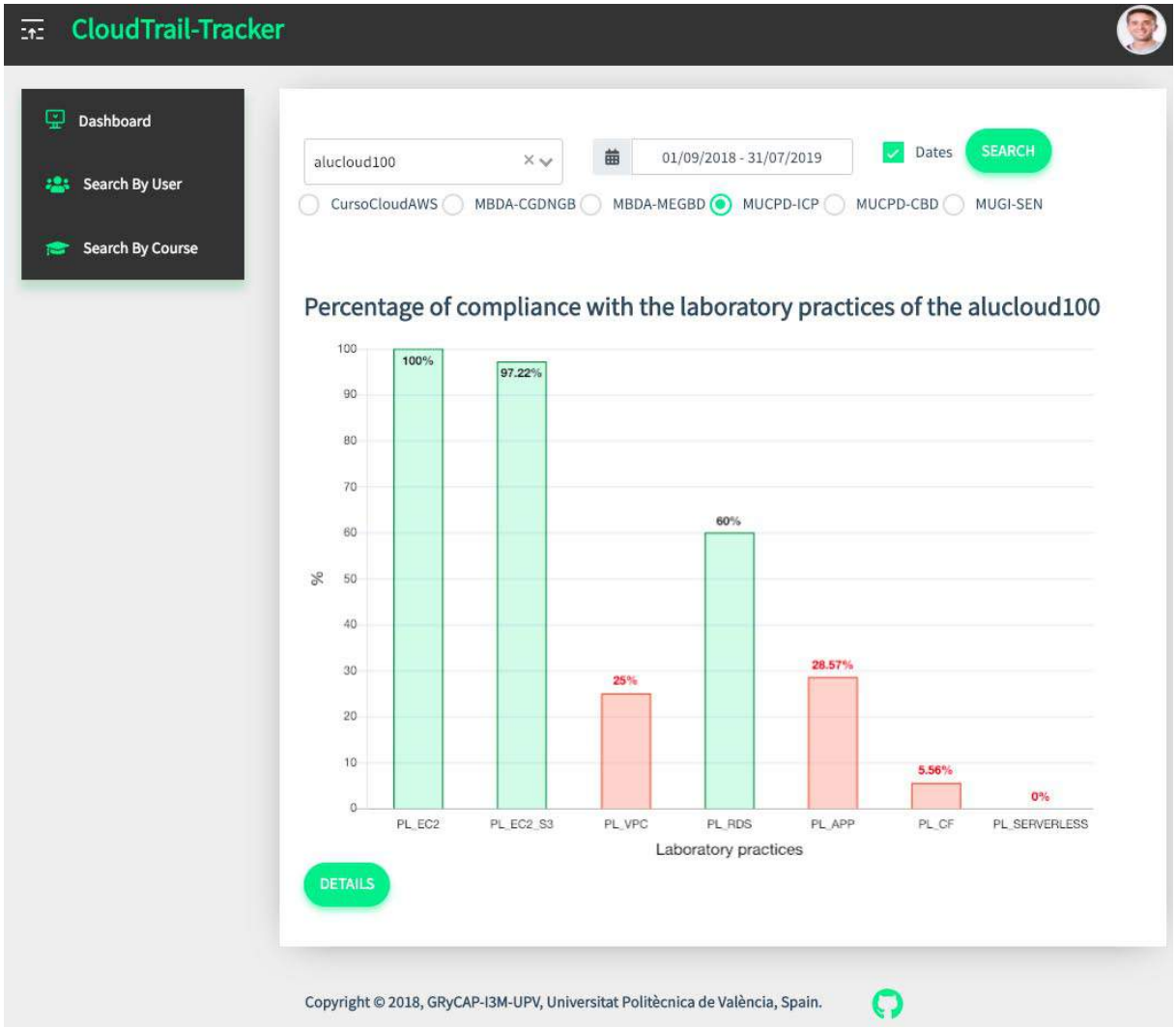
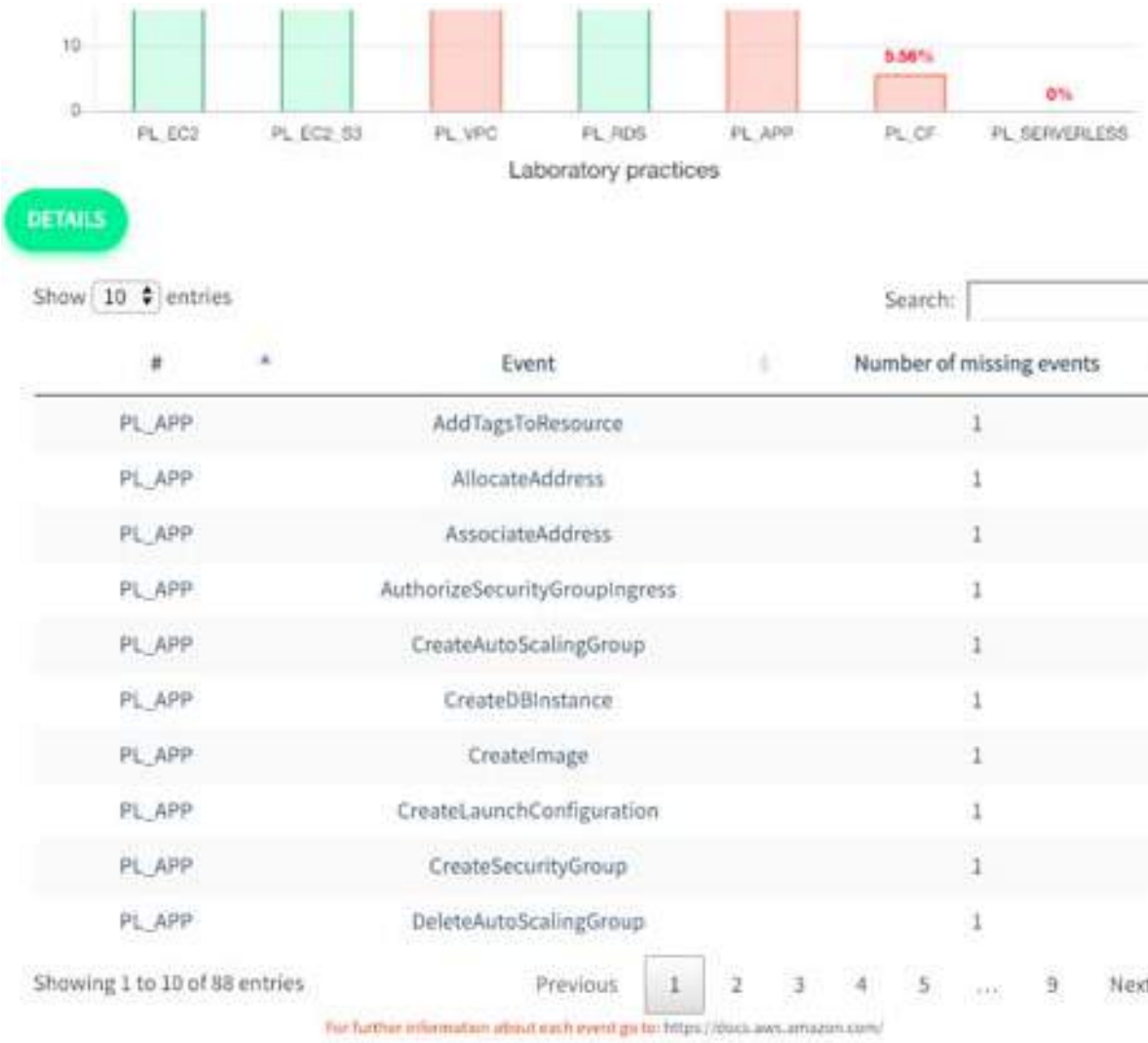


Figura 2
Dashboard de progreso de las actividades prácticas



Para este caso se ha desarrollado una aplicación web propia llamada *CloudTrail-Tracker* (http://www.grycap.upv.es/cloudtrail-tracker), accesible fácilmente por el alumno mediante un navegador, que incluye un *dashboard* con información de su progreso en cada una de las prácticas, tal y como muestran las diferentes barras de la Fig. 2 (100% significa que se han realizado todos los pasos indicados). También es posible ofrecer un panel inferior con el detalle de los pasos que faltan, en una determinada práctica, para completar la misma, tal como se indica en la Fig. 3. Como fuentes de datos se utilizan las ofrecidas por el servicio *CloudTrail* que, a partir de las actividades realizadas, genera automáticamente una serie de eventos guardados en ficheros que la herramienta captura, procesa y almacena en una base de datos NoSQL. La aplicación se ha puesto en producción tanto para 5 asignaturas de diferentes másteres como en un curso de formación *online*.

Figura 3
Detalles de los pasos pendientes en una de las prácticas



2.3. Otros casos de estudio

Otros casos de estudio parten de los informes que los profesores pueden obtener de *Poliformat* (Mengod, 2006), el LMS de la UPV. Estos informes incluyen como fuentes de datos los accesos a los recursos del sitio, el tiempo de actividad en la plataforma, el número y tipo de eventos, las tareas y cuestionarios realizados, entre otros. Con el fin de desarrollar en el estudiante sus habilidades de autorregulación del aprendizaje que le ayuden a conseguir sus objetivos, se ha diseñado un *dashboard* propio que incorpora un conjunto de descriptores sobre su actividad, tal como y muestra la Fig. 4.

Figura 4

Prototipo inicial del dashboard del estudiante para un sitio de PoliformaT

3. Conclusiones

Dada la dificultad que tienen los profesores universitarios para proporcionar una atención personalizada a sus estudiantes sobre su desempeño, este trabajo ha explorado técnicas de analítica del aprendizaje para, a partir de los datos generados en distintos de entornos digitales de soporte al aprendizaje, y de una visualización efectiva de la información extraída, se facilite una mejora en la metacognición y las estrategias de autorregulación de los estudiantes, que favorezca la implicación en su aprendizaje. A falta de nuevas investigaciones que confirmen los logros conseguidos hasta el momento, este trabajo ha mostrado que el enfoque propuesto puede aplicarse a entornos y modalidades de aprendizaje bastante diferentes.

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Obren Plangintza eta Kudeaketa irakasgai "iraunkortuan", gizarte erantzukizuna integratzeko irakaskuntza-ikaskuntza planteamendua

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Laburpena

Bilbon egin zen RED-U 2017 Nazioarteko Biltzarrean, *Lanen Plangintza eta Kudeaketa irakasgaiaren iraunkortze-prozesua* komunikazioa aurkeztu nuen (UPV/EHUko Gipuzkoako Ingeniaritza Eskolan Ingeniaritza Zibileko Graduko 4. mailan ematen dut irakasgai hori.) Irakasgaiari ikuspegi iraunkorra gehitzeko, hiru ikasturtetan osaturiko bidea kontatu nuen. Geroztik, garapen jasangarrirako helburuek (GJH) irakasgaiaren ikaskuntza-helburuekin eta -gaitasunekin izan ahal duten lotura aztertzeko prestakuntza egin dut; irakaskuntza-ikaskuntza prozesuan ezartzeko proposamena izan da emaitza. Iraunkortasuneranzko hezkuntzaren eredu holistikoak berezko ditu GJHak, eta, nahitaez, pentsatu eta ekiteko beste modu bat eskatzen du, *Eraldaketarako Hezkuntza* paradigmarekin bat datorrena. Paulo Freire aitzindariak esana da: *Hezkuntzak ez du mundua aldatzen, munduaren eraldaketa eragin dezaketen pertsonak baizik*. Testuinguru honetan kokatzen dut biltzarrak gogoetarako planteatzen duen *Nola integra ditzakegu gizarte erantzukizuna eta iraunkortasuna irakaskuntzan?* galdera. Eta 2019-2020 ikasturtean ezartzea aurreikusten den irakaskuntza-ikaskuntza planteamendu zehatz baten proposamenarekin erantzun posible bat aurkezten da. Donostiako Udaleko *Hirigintza Sostengarriko Zuzendaritza* eta *Proiektu eta Obren* sailarekin lankidetzan, ikasleriak *Proiektuak, Segurtasuna* eta *Obren Plangintza eta Kudeaketa Iraunkorra* irakasgaietan, lantaldeetan garatu beharreko obra-proiektuaren gaia zehaztu eta hirigintza iraunkorreko irizpide eta eskakizunak aintzat harturik, hirigintza alorreko behar/arazo erreal bati konponbidea eman beharko diote. Planteamendu mota hau gizarte-ardura kontzientzia pizteko ekintza estrategikotzat jotzen da Nazioarteko Lankidetza eta Garapenari buruzko Ikasketa Institutuak (HEGOA) argitaraturiko *Gizartearekin Konprometitutako Unibertsitate bat lortzeko Bidean* lanean.

Abstract

In the international conference RED-U 2017, held in Bilbao, the communication *"The integration of sustainability in the course Construction Planning and Management"*, taught in the fourth year of Civil Engineering grade in the Faculty of Engineering, Gipuzkoa, was presented. The three-year-way to add a sustainable standpoint to the course was explained. Since then, an analysis on the connection between the Sustainable Development Goals (SDGs) and the learning objectives and competences of the course has been carried out. The result is the proposal to include sustainability in the teaching-learning process. The SDGs are inherent to the holistic model of Education towards Sustainability and implies another way of thinking and acting, in accordance with the Education for Transformation paradigm. According to Paulo Freire, "*Education does not change the world. Education changes people. People changes the world*". The question set out in the conference *How can we integrate the social responsibility and sustainability in education?* is positioned in this context. A possible response may be the here proposed teaching-learning specific process. It will be carried out in collaboration with the Direction of Sustainable Urban Planning from Donostia council and the department of Projects and Construction. Working in groups, students must define the topic of a construction project and give response to a real situation of urban planning adapted to the criterions and requisites of sustainable urban planning. This approach is considered as a strategic action to activate the social responsibility awareness in the work "*Gizartearekin Konprometitutako Unibertsitate bat lortzeko Bidean"* published by HEGOA (Institute for International Cooperation and Development Studies).

1. Sarrera

Europa Batasunak, 2015. urtean *Agenda 2030 Garapen Jasangarrirako Helburuak* (GJH) argitalpenean, iraunkortasuneranzko hezkuntzari gaur egungo mundu-mailako krisi sozioekonomiko eta ekologiko globalari aurre egiteko funtsezko tresna deritzo [1], eta iraunkortasun-gaitasunak garatzeko hezkuntza-eredu egokia, iraunkortasunaren ikuspegi holistikoa integratzen duena egoki jotzen du [2]. Eredu honek, ikaskuntza-estrategia bezala, tokiko komunitatean eta praktika sozialetan gorpuzten diren praktikak gomendatzen ditu [3-5], eta ikasleriak ere praktikari atxikitzen dio eraldaketa gaitasuna [6]. HEGOA *Nazioarteko* Lankidetza eta Garapenari buruzko Euskal Ikasketa Institutuak ere, gizartearekin konprometitutako unibertsitate bat lortzeko bide estrategikoetako bat, ingurunean eta parte hartzen duten subjektuekin testuinguruan kokatutako irakaskuntza oinarrizkoa dela irizten du [7].

Komunikazio honetan aurkezten den irakaskuntza-ikaskuntza planteamendu didaktikoak irakaskuntzan iraunkortasuna eta gizarte-erantzukizuna nola integratu galderari erantzuten dio, arestian aipatu diren ezaugarriak biltzen dituen ekinbide estrategikoaren bidez. Irakasgaiaren jarduketa-esparruan (Ingeniaritza Zibileko proiektuen eta lanen plangintza- eta kudeaketa-arloak) tokiko instituzio publikoarekiko lankidetzan ikasleriak garatu beharreko proiektu-gai iraunkorra definitzen da. Honek iraunkortasunaren ikuspegia zeharkako perspektibarekin lantzea inplikatzen du, eta, defektuz, erlazio zuzena eta zeharkakoa duten GJHen lanketa; horrek ikasleriarengan gizartearekiko erantzukizun-kontzientzia piztea laguntzen du.

Badira hiru ikasturte *Lanen Plangintza eta Kudeaketa* irakasgaia iraunkortasunaren ikuspegi hirukoitzaren [8] perspektibarekin irakasten dela. Honenbestez, irakaskuntza-gidan, iraunkortasunaren baitako *Ezagutza kritikoki testuinguruan kokatzea, gizartea, ekonomia eta ingurumeneko arazoekin erlazionatuz eskala lokal eta globalean* [9] zeharkako gaitasuna gehitua dago; halaber, eduki teorikoak garatzeko jarduera kooperatiboen enuntziatuetan, iraunkortasuna lantzeko elementua txertatua dago. Iraunkortasuna lantzeko erabiltzen den ikaskuntza-estrategia *Zeharkakotasuna* da (*IkasPuntu Zehar, Ikasgai Iraunkor* izeneko estrategia didaktikoa erabiltzen da) eta autoreak sorturiko *Elkarlan* gida-praktikoa erabiltzen da iraunkortasunaren ikuspegi hirukoitzaren azterketa eta plangintzak egiteko.

2. Metodologia

Irakasgaian gizarte-erantzukizuna txertatzeko, irakasgaiaren gaitasun espezifiko eta zeharkakoetan GJHak nola integratu daitezken aztertu da, eta ohartu hamazazpi helburuetatik hamalau jada lantzen direla irakasgaia *iraunkortua* izateagatik. Honenbestez, oso erraz egin da GJHen eta ikaskuntza-emaitzen arteko erlazioa, bai eta hauek betetzeko aurretiaz sorturiko jarduera kooperatiboen egokitzapena ere. Xede hau praktikara eramateko, irakaskuntza-ikaskuntza planteamendu bat definitu da; *Proiektuetan Oinarrituriko Ikaskuntza* metodologiaren bidez gauzatzen da, eta biltzen dituen osagaiak ondorengoak dira:

1. Irakasgaiaren jakintza-esparru profesionalean egituratzen da.
2. Ingurunean eta parte hartzen duten subjektuekin testuinguruan kokatzen da.
3. Iraunkortasunaren ikuspegi hirukoitzaren zeharkakotasuna.

3. Emaitzak

Gizarte-erantzukizuna irakasgaian txertatzeak hiru plano ezberdinetan sortu ditu emaitzak:

1. Irakasgaiaren diseinu teorikoan: irakaskuntza-gidan bi hedapen gauzatu dira. Lehena iraunkortasunaren zeharkako gaitasunaren barruan: GJHek hirigintza iraunkorrarekin duten erlazioa identifikatzea bideratzen duen ikaskuntza-emaitza berria gehitu da; eta bigarrena: iraunkortasunaren ikuspegia gai-blokean GJHak ezagutzeko azpigai berria sortu da.
2. Irakasgaiaren diseinu praktikoan: Tokiko Udaleko Hirigintza Sostengagarriko Zuzendaritzarekiko lankidetzan proiektu-gaia definitu da (hirigintza-proiektu erreal baten iraunkortasun-diagnosiaren eta diseinu iraunkorrago baten proposamena ardatz duen). Bai eta Udaleko teknikarien eta obra egingo duen eraikuntza-enpresako langile eta ikasleen arteko elkarrekintzako lan-saioak diseinatu dira.
3. Irakats-baliabideetan: Aurretiaz sorturiko jarduera kooperatiboen enuntziatuetan GJHak lantzeko iraunkortasunaren lanketa eskatzen duen elementuaren parekoa gehitu da. Eta bosgarren GJHa den *Hiri Jasangarriak* lantzeko, *hausnarketa iraunkorra* izeneko foroa diseinatu da. Bertan, eskala lokalean eta globalean gertatzen diren kasu gatazkatsuak aurkeztuko dira eta gogoeta kritikoaren bidez helburuaren perspektiba kontzeptuala landuko da.

4. Ezarpena

2019-2010 ikasturteko lehenengo lauhilekoan Ingeniaritza Zibileko Graduko 4. mailako *Proiektuak* eta *Lanen Plangintza eta Kudeaketa* irakasgaietan gauzatuko da irakaskuntza-ikaskuntza planteamendua. Irakasgai bakoitzak bere norainokoaren arabera esku-hartze mota bat duenez proposamenean, *Proiektuak* irakasgaian proiektuaren entregagaiaren iraunkortasun-maila ebaluatuko da, eta *Lanen Plangintza eta Kudeaketa* irakasgaian, berriz, iraunkortasuna eta gizarte-erantzukizunaren zeharkako lanketaren irakaskuntza-ikaskuntza prozesua. Prozesua *iraunkortasuna* zeharkako gaitasunean definitu diren sei ikaskuntza-emaitza neurtuz ebaluatuko da. Ebaluazio-tresna bezala, Silvia Albareda-Tiana eta Margarita Gonzalvo-Cirac egileek *Goi Hezkuntzan, Iraunkortasunaren Gaitasun Orokorrak. Berrikuspena eta Konpilazioa* [10] artikulu zientifikoan proposatzen dituzten bi azpigaitasun erabiliko dira. Egiaztatze-iturriak, berriz, jarduera kooperatiboen entregagaiak izango dira, bai eta *hausnarketa iraunkorra* izeneko foroan egindako ekarpen eta parte-hartzea ere. Aurreikusten diren emaitzen artean bereizten dira, batetik, irakasgairen ikaskuntza esanguratsuagoa izatearen lorpena eta, bestetik, ikasle banakoarengan jarreran nahiz balioetan gizarte erantzukizunarekiko kontzientzia piztea edo areagotzea.

Eskertzeak

Autoreak UPV/EHUko GAITUZ 2019 deialdian jasotako dirulaguntza eskertu nahi du, eta bai Gipuzkoako Ingeniaritza Eskolari esker onak eman ere, Ingeniaritza Zibileko Graduan DUALA prestakuntza-modalitatea martxan jartzeak proposamenaren sorkuntza ahalbidetu duelako.

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Towards deep, coherent learning and long-term knowledge

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Abstract

The main challenge of the study is to initiate a deep approach to learning that results with long-term knowledge and experience in problem solving skills. The concept of a deep approach to learning that originates from the work of Marton and Säljö [1] differentiates the intrinsic, self-motivated intension to understand and gain knowledge from the surface approach that is driven by reproduction of studied material, fear of failure and a desire to keep out of trouble [2]. In the current study, to initiate abovementioned deep and self-directed learning process, the environment for problem-based learning (PBL) as well other creative activities were supported. PBL is characterized by learning in small groups, the teacher is facilitating group learning, the learning process is initiated by problems, and new information is acquired through self-study. Students involvement in a supportive and collaborative learning environment involves the mechanisms through which PBL is assumed to enhance deep learning and coherent knowledge [3].

The aim of the study was to apply active learning methods in physical and environmental chemistry by teaching non-chemists to achieve more motivated, self-directed students with a deeper understanding of the subject with coherent long-term knowledge.

The study focused on the changes in students learning motivation, self-directed learning and attitude towards deep approach to learning during studying in an active learning environment. The questionnaire consisted overall of 15 questions and it was used twice: the student's feedback at the beginning of the courses as well at the end of the courses was collected and the impact of change were analyzed. The results of the analysis are used for input for further re-design and improvement of the courses.

1. Results and discussion

1.1. Student motivation

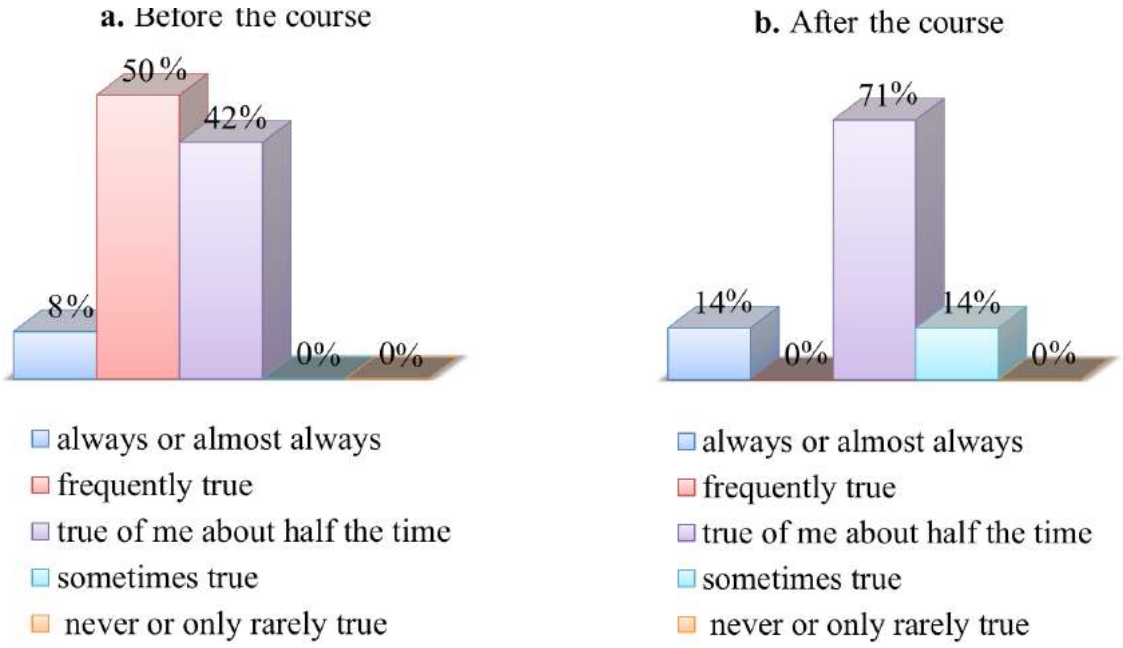
Changes in student motivation during the course were studied with five different questions. Students were able to evaluate the question as this '*item is always or almost always true of me*' to '*this item is never or only rarely true of me*' (Fig. 1). The results of the survey showed that students' self-motivation was very high. At the beginning of the course, 92% of the respondents answered the question *'I find that studying academic topics can at times be as exciting as a good novel or movie' always* or *frequently*, at the end of the course, the percentage of respondents increased even more.

The study revealed that 1st year non-chemistry student's motivation and assessment of the applicability of the knowledge in the future professional life is high, where 58% of the students evaluated the question *'With this course, I develop a good professional qualification'* answer as always to frequently (Fig. 1a). At the end of the course, 44% of students changed their answer from *frequently* to *sometimes* (Fig. 1b). Considering the amount of theoretical material that must be acquired and the requirements to understand the theory along with applications, it could be understandable that the student's evaluation about the associations of theoretical knowledge's with real life applications dropped. Therefore, during the design of the course, new applications and practical examples are needed to explain the applicability

of the subject. In addition, it should be considered that the final assessment was mainly dependent on theoretical knowledge and task solving, and it can be assumed that students focused on passing the exam and learned theoretical knowledge. Therefore, changing the final examination should also be taken into consideration.

Figure 1

Results for the student questionnaire question 'With this course, I develop good professional qualification', a. the questionnaire results at the beginning of the courses, b. the questionnaire results after the course.

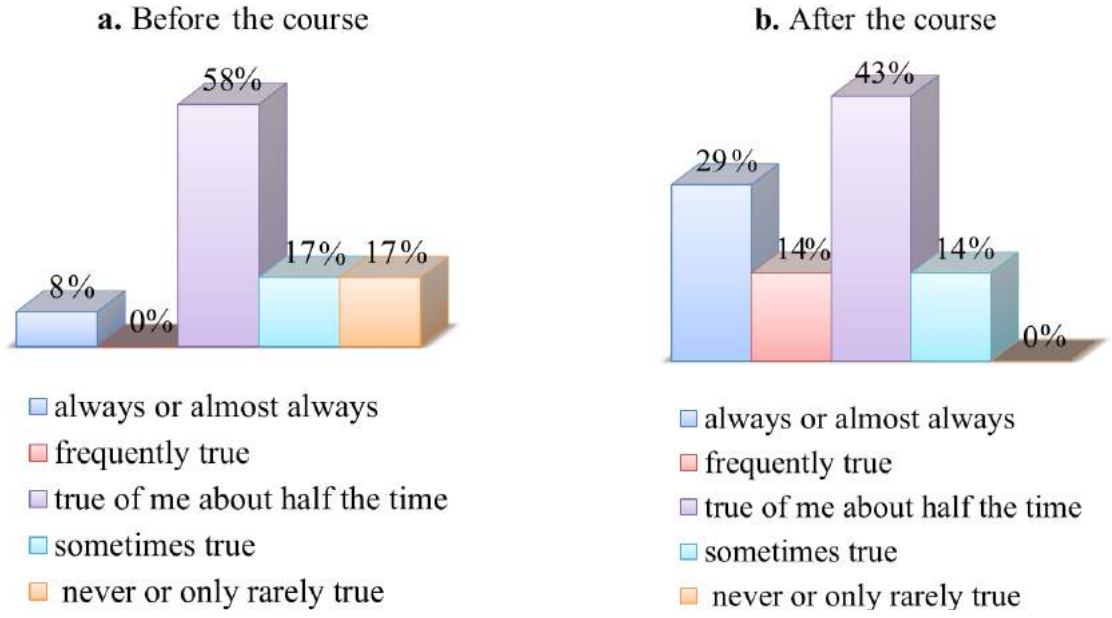


1.2. Self-directed learner

During the redesign of the courses in this study, the lecturers used different active learning methods including PBL, to captivate students and applied the new approach right from the first lecture. As a result, the readiness for class-room discussions and another kind active co-operation during contact hours raised remarkably. The number of students who are always ready for discussions increased 20%, and many students changed their answer from *sometimes* to *often*, in comparison of the answers at the beginning of the course and at the end (Fig. 2).

Figure 2

Results for the student questionnaire question 'I prefer a class format delivered through open discussion', a. the questionnaire results at the beginning of the courses, b. the questionnaire results after the course

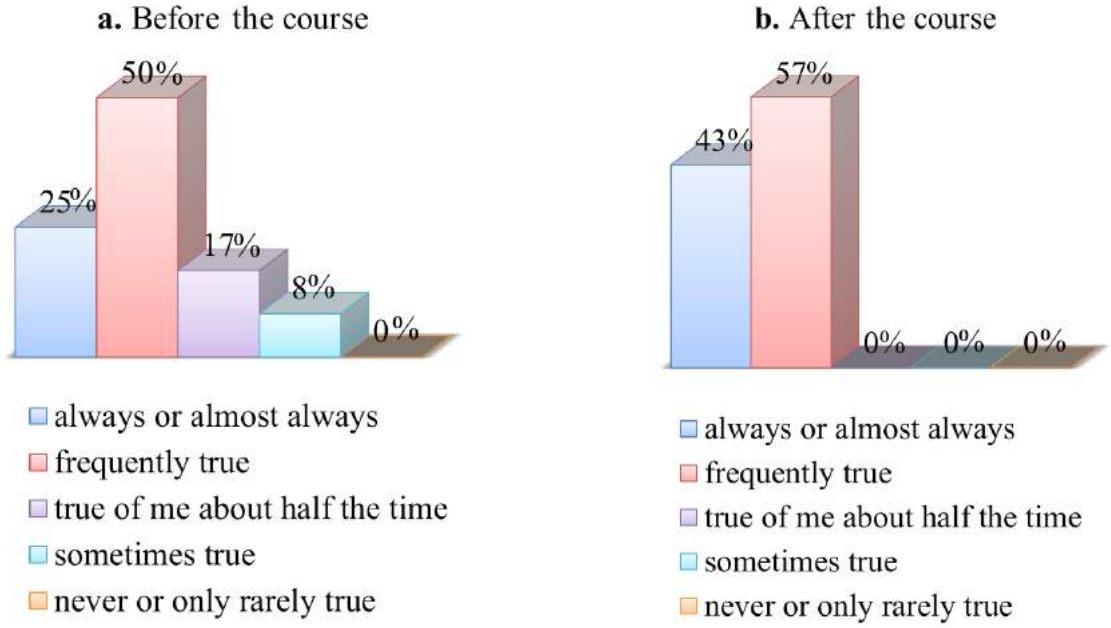


1.3. Deep approach to learning

Students were asked to evaluate their analytical skills as well the abilities for solving the problems. Both indicators were estimated with high scores, and that didn't change during the course. Still, the application of PBL and student's captivation methods gave students a good experience, so 20% of students changed their answer to *often* to the question about the skillfulness of solving new problems (Fig. 3).

Figure 3

Results for the student questionnaire question 'The course exercises developed my problem-solving skills, a. the questionnaire results at the beginning of the courses, b. the questionnaire results after the course



The study also investigated the student's readiness to act as self-directed learners [3]. According to the questionnaire, the motivation and the expectations of applicability of the knowledge are high, most of the students are ready for discussions and group work, but the comments revealed that the results of active teaching and learning don't present enough closure to the solution of a particular task. The answers initiate the teacher to improve the concluding part used methods as well to support more the self-directedness of students.

2. Conclusion

The students' self-motivation before courses could be very high, they agreed that *'I find that studying academic topics can at times be as exciting as a good novel or movie'* according to applied questionnaire, which provides an excellent foundation for applying different active learning methods. With the open approach to discussion, application of active learning methods and PBL tasks the applicability of science subjects becomes more visible and that is very important to maintain the motivation to learn with the deep learning approach. The

teacher creates the learning environment, primarily and sets the requirements of the course, therefore the captivation of students and application of active teaching and learning methods should be used throughout the course, starting from the first lecture.

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How Student-Faculty Pedagogical Partnerships Contribute to Epistemic Justice: Valuing Students' Knowledge(s) and Cultivating Confidence

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Abstract

Echoing a wide range of research, the UN's sustainable development goals underscore the need to make postsecondary education inclusive for students from marginalized groups (including women, disabled, racialized, Indigenous, and LGBTQ+ students). Our work proposes that in addition to embracing human rights frameworks, we also need to politicize epistemic/affective states and affirm the role that micro-level practices play in wider justice efforts. This proposition is in keeping with critical writing by feminist and disability studies scholars, among others, who recognize the limitation of only attending to structural reconciliation or redistribution (Fricker, 2007; Thomas, 1999; Stauffer, 2015) and argue for also redressing psychological forms of oppression (Bartky, 1990; Reeve, 2012, 2015; Thomas, 1999, 2007). Our paper draws on data from two studies, one in Canada and one in the United States, focused on experiences of pedagogical partnership as described by students traditionally underrepresented and underserved in higher education. These students argue that such collaborations with faculty hold promise for creating more inclusive and responsive practices. Using the concept of epistemic justice (Fricker, 2007), we explore how student-faculty partnerships can facilitate epistemological forms of equity and inclusion by (1) creating more equitable conceptions of knowing and knowledge that open possibilities for (2) fostering students' confidence in their knowledge and willingness to share it with others. While "confidence" (or related concepts like empowerment, agency, self-efficacy) is often noted as a positive outcome in pedagogical partnership literature (Cook-Sather & Luz, 2015), it has not been theorized in much depth. Our work thus contributes a framework through which we might clarify our use and understanding of these terms in our discussions of student engagement. We argue that a conceptualization of "epistemic confidence" and practice of students as partners in educational development/scholarship can bring about greater epistemic justice in higher education. Rather than treat "confidence" as (only) an individual and psychological-level outcome, we amplify its political significance.

1. Introduction

Echoing a wide range of research, the UN's sustainable development goals underscore the need to enhance the inclusion of marginalized students in post-secondary education. Our work proposes that in addition to embracing human rights frameworks, we also need to affirm the micro-level practices that contribute to wider justice efforts. This proposition is in keeping with critical writing by feminist and disability studies scholars, among others, who recognize the limitation of only attending to structural reconciliation or redistribution

(Fricker, 2007; Thomas, 1999; Stauffer, 2015) and argue for also redressing psychological and epistemic forms of oppression (Bartky, 1990; Fricker, 2007; Reeve, 2012; Thomas, 1999).

Drawing on the concept of epistemic justice (Fricker, 2007), understood here as fairness at the level knowledge-related recognition, generation, and exchange, we explore how student-faculty partnerships can facilitate epistemological forms of equity and inclusion by (1) creating more equitable conceptions of knowing and knowledge that open possibilities for (2) fostering students' confidence in their knowledge and willingness to share it with others. While a concept like 'confidence' may be classified as an individual-level outcome, and thus not necessarily central to broader conversations about equity and inclusion, this paper investigates its political significance in the facilitation of epistemic justice.

1.1. Project Background, Research Question, and Methods

This paper emerges from broader research into two extracurricular pedagogical partnership programs, the Students as Learners and Teachers (SaLT) program at Bryn Mawr and Haverford Colleges in the United States and the Student Partners Program (SPP) at McMaster University in Canada. While operating in unique ways, both SaLT and SPP seek to facilitate inclusion through the recruitment of students from equity-seeking groups and student allies to work as paid partners with faculty on a range of pedagogical research and classroom projects (Cook-Sather, 2014; Marquis *et al.*, 2016c; Marquis *et al.*, 2017).

The qualitative methodology of our broader project included research ethics board-approved, in person and/or online interviews. We invited all students who had engaged in SaLT or SPP and identified as a member of one or more equity-seeking groups to participate, gathering eight interviews at McMaster University and 31 at Bryn Mawr and Haverford Colleges. While our larger research project did not ask participants questions with epistemology and epistemic justice in mind, Alise began to feel these themes in the data as they resonated with their own experiences as a student from equity-seeking groups (de Bie, 2019). Consequently, we posed for ourselves the following subquestion for exploration: How does the framework of epistemic justice illuminate and situate students' perspectives on the potential of pedagogical partnerships to promote greater equity and inclusion?

2. Project Findings: Promoting Epistemic Justice Through Pedagogical Partnership

Below we highlight student perceptions and experiences of how partnerships: (1) create more equitable conceptions of knowing / knowledge that (2) foster the development of epistemic confidence—students' comfort in and excitement about sharing their knowledge.

2.1. Creating More Equitable Conceptions of Knowing and Knowledge

Pedagogical partnerships shift dominant understandings of who counts as a knower, how knowledge is produced, and which knowledge is of value, thus contributing to more equitable conceptualizations of knowledge.

Who Is a Knower?

Student partners began to affirm their own capacities as knowers. By working in partnership with faculty, they came to see how their partners are not the only knowers in the academy. Rather, faculty are human beings who continue to work and learn over time, just like students: *Professors aren't just people… who have to know everything and can do everything... I feel like I've been given a platform to say, "No, I know things [too]..."* (Participant 7). Faculty contribute to this recognition when they acknowledge that students know things they themselves do not, making it possible for students to begin to claim ownership over their own knowledge and ability to know, as Participant 6 expresses: *"For the most part, I felt my perspectives were valued [...], the professors would say, 'Oh I never thought of it that way or never thought to question that.'"* In this way, partnerships recognize (and encourage students to themselves affirm) students as valued knowers.

How Does Knowing Work?

Partnerships also provided students with opportunity to learn about and participate in the process of collaborative knowledge production. Through partnership, students gained access to some of the 'secrets' of the university, such as behind-the-scenes conversations about teaching:

> [I]t's really a good opportunity for… the students getting that insider perspective into academia. ...I just feel more confident in understanding why my teachers are doing things the way they are doing them. You are in the middle of an exercise and you're like, "Ha, I see what you are getting at there." (Participant 11)

Having access to this knowledge helped participants learn more effectively, communicate with faculty, and feel more confident negotiating campus. Partnerships also invite students into the coproduction of knowledge, where they learn how knowledge works from participating in its creation.

Which Knowledge Has Worth?

Students began to re-evaluate the worth of particular ways of knowing, for example, identifying the significance of passion, emotion, and embodied engagement as components of knowledge and describing how their feelings were valued in partnership as a legitimate contribution. When knowledge production feels more 'honest,' partners also offer ideas at initial stages, and have more opportunity to build knowledge together. In these ways, pedagogical partnerships broaden the interpretive frameworks available for assigning worth to knowledge, embolden students as knowers, and advance epistemic justice.

2.2. Fostering Epistemic Confidence

Students also came to gain "epistemic confidence" (Fricker, 2007) through their participation in partnership—that is, the courage to generate and use their knowledge.

Gaining Confidence

Like students quoted in other pedagogical partnership literature (e.g., Cook-Sather & Luz, 2015), participants in our research described gaining confidence in their knowledge and ability to know, learn, and contribute as a result of participating in partnership: *I am more confident in what I know: I know what I experience and there is value in that.* (Participant 9) Working in a supportive team was positioned as important to developing this confidence, as was having opportunities to transition into a teaching or consultant role, and to see the development of their skills as a researcher: *"being able to ... show [a fellow student partner] ...how you do a focus group. ...Things like that have given me more confidence and made me feel like, oh, look, I can do things"* (Participant 2).

Sharing Knowledge

When students felt heard, valued, and like their ideas were taken seriously, their willingness to share their knowledge(s) with others was positively impacted: *"I was more aware of my own identity and my own experiences and what I can contribute. I think I felt stronger and more empowered to give my voice."* (Participant 3). This is especially important for students from equity-seeking groups who, given experiences of epistemic injustice, are often prevented from participating in knowledge exchange (Kotzee, 2017). Students described becoming confident to voice their ideas within the partnership, but also in the classroom, in conversation with other students, and in broader teaching and learning contexts. They also encouraged the voices of their peers. In this way, students are involved in extending the epistemic and equity-related benefits of partnership beyond themselves.

3. Discussion

We have endeavoured to make two central contributions to the growing literature on equity and inclusion in higher education: First, we offer the conceptualization of epistemic justice (Fricker, 2007) as a generative frame for recognizing the 'epistemological' as highly relevant to equity work in higher education. Secondly, we draw on our participants' experiences of participating in pedagogical partnership programs to suggest that such programs offer one strategy for working toward epistemic forms of inclusion.

While easily subsumed into individualized, psychological frameworks of 'self-esteem' and 'assertiveness,' and ignored within broader conversations about equity and inclusion, confidence can be politically significant. When people lack epistemic confidence, they can be prevented from developing and contributing knowledge, and, thus, blocked from being who they could have been (Fricker, 2007). Moreover, the argument that epistemic confidence relates closely to intellectual courage —perseverance in one's ideas and knowledge (Fricker, 2007)—points toward the ways in which micro-level experiences of change may contribute to broader social and cultural shifts. By becoming more confident in their knowledge, the participants in our study likewise became more willing to share and advocate for that knowledge, laying the groundwork for new relationships and conversations that may contribute to equity and inclusion on a broader scale.

This analysis extends considerations of equity and inclusion that tend to focus on systemic/structural approaches, or on steps and checklists for teaching more inclusively or training inclusive educators (Lawrie *et al.,* 2017; Marquis *et al.,* 2016a; 2016b). Instead, both partnership and epistemic justice encourage us to think about how equity may be advanced through dynamic, relational means (Campano *et al.,* 2016). While structural issues should not

be ignored or individuals 'responsibilized' for achieving equity, these relational, confidence-building practices may be an important piece of the puzzle.

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Resolución de problemas matemáticos y dominio afectivo en alumnos del grado de Maestro

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Resumen

Los afectos en el aprendizaje de las matemáticas y, en la resolución de problemas matemáticos (RPM) son cruciales para la motivación hacia la tarea. Con frecuencia los maestros plantean que los alumnos, en general, no suelen estar motivados para el aprendizaje de las matemáticas. Este aprendizaje, parece que, en general, les resulta arduo a los alumnos, tanto de la enseñanza obligatoria como de la postobligatoria. Sabemos también, que el entusiasmo, y la fascinación, son "excelentes abonos" para estimular y mover hacia el aprendizaje, para activar la motivación, y para dinamizar las "ganas" de aprender.

Nos proponemos analizar esta cuestión en estudiantes para maestro de primaria (EMP). En este trabajo, se aportan algunos resultados derivados de la administración del cuestionario de (Caballero Carrasco & Guerrero Barona, 2015), sobre Dominio Afectivo en la RPM a una muestra de EMP con el fin de adquirir una visión general de la realidad de las aulas en lo que al dominio afectivo en la RPM respecta y poder establecer una discusión con otros trabajos de este tipo.

La muestra sobre la que se administró el cuestionario está conformada por un total de 110 EMP del primer curso de Magisterio, Educación Primaria, de la Facultad de Educación de la Universidad de Cantabria.

Abstract

The emotional reactions in learning mathematics and, in the resolution of mathematical problems (RMP) are crucial for the motivation towards the task. Teachers state that students are often not motivated to learn mathematics. Moreover, it seems that this learning is difficult for students, both in compulsory and post-compulsory education. Furthermore, we also know that enthusiasm and fascination are "excellent fertilizers" to stimulate and move towards learning, to activate motivation, and to energize the "desire" to learn.

We intend to analyse this question in students of primary school teaching (SPT). In this work, some results are provided that are derived from the administration of the questionnaire of Caballero, A. and Guerrero, E. (2015), on Affective Domain in the RMP, to a sample of SPT, with the goal of acquiring a general vision of the reality of the classrooms with respect to affective domain in the RMP and establishing a discussion with other works of this type.

The sample on which the questionnaire was administered is made up of a total of 110 SPT of the first course of Primary School Education Teaching of the Faculty of Education of the University of Cantabria.

1. Justificación

La motivación comprende procesos que dan energía, dirigen y mantienen la conducta (Santrock, 2000). Existen diferentes perspectivas psicológicas que analizan la motivación. Una de ellas es la cognitiva, que en los últimos años está adquiriendo cierta relevancia en el mundo educativo. Desde esta perspectiva, los pensamientos de los estudiantes activan y

mantienen su motivación (Meece & Eccles, 2010). Este interés se centra en ideas como la motivación interna de los estudiantes, sus atribuciones (percepción sobre las causas del éxito o el fracaso, especialmente la percepción de que el esfuerzo es un factor importante para lograr un buen rendimiento), y sus creencias de que pueden controlar eficazmente su ambiente (Santrock, 2000). De ahí la importancia de conocer e incidir sobre estas cuestiones.

Por ello, nos propusimos analizar las concepciones, creencias, actitudes y emociones que vivencian los estudiantes en el proceso de aprendizaje de las matemáticas y de la RPM, en un grupo de estudiantes para maestro de primaria (EMP). Para ello, optamos por la administración del Cuestionario planteado por (Caballero Carrasco & Guerrero Barona, 2015), sobre Dominio Afectivo y Resolución de Problemas de Matemáticas, que consta de un total de 21 ítems que pertenecen a 4 dimensiones, sobre este tipo de Dominio en la RPM, a una muestra de EMP con el fin de adquirir una visión general de la realidad de las aulas en este ámbito, y poder establecer algunas conclusiones, así como su posterior discusión con otros trabajos de este tipo. La muestra a la que se administró el cuestionario estuvo conformada por un total de 110 estudiantes del primer curso de la Facultad de Educación de la Universidad de Cantabria. Si bien, únicamente se dieron por válidas las respuestas de 105 estudiantes.

Las cuatro dimensiones analizadas en el cuestionario son:

a) Creencias acerca de la naturaleza de los problemas matemáticos y de su enseñanza y aprendizaje.
b) Creencias acerca de uno mismo como resolutor de problemas matemáticos.
c) Actitudes y reacciones emocionales hacia la RPM.
d) Valoración de la formación recibida en los estudios de magisterio en relación con la RPM.

Para las opciones de respuesta se estableció una escala Likert con cuatro alternativas:

— 1 = Muy en desacuerdo.
— 2 = En desacuerdo.
— 3 = De acuerdo.
— 4 = Muy de acuerdo.

El objetivo fundamental de este estudio radica en descubrir y analizar el conjunto de relaciones que se manifiestan entre diferentes variables que intervienen en este proceso de aprendizaje. Lo que se busca es el conocimiento de una serie de datos, así como, el grado de relación entre ellos y el nivel de significación de estos. En la actualidad se hace necesario el conocimiento preciso de los temas que afectan al aprendizaje de las personas. Por ello, las encuestas, al constituir un sistema de obtención de información de grupos determinados de sujetos se han constituido como instrumentos muy útiles para la investigación.

La investigación mediante encuestas es un instrumento muy adecuado para desarrollar el conocimiento de la conducta humana y de los procesos educativos, así como para tomar decisiones, al permitir el análisis de la realidad sin intervenir a priori en la misma, dado que las encuestas se fundamentan en la obtención de información sobre la realidad, tal y como se presenta en un momento determinado, y en el análisis de las relaciones entre la multitud de variables que configuran la actuación humana (Gil & Martínez, 2001).

Al tomar la decisión de realizar una encuesta en el mundo educativo, hay que considerar el hecho, de que además de servir para obtener la información requerida, el instrumento constituye en sí mismo un mensaje que se transmite a los encuestados (Barrio Fernán-

dez, 2017). Los contenidos de los cuestionarios y pruebas constituyen mensajes en sí mismos que deben de ser tenidos en cuenta a la hora del diseño de la encuesta.

En el caso concreto que nos ocupa, (Caballero Carrasco & Guerrero Barona, 2015) hacen una amplia revisión de cuestionarios para conocer las creencias, actitudes y emociones de los estudiantes, así como, de los futuros docentes hacia las matemáticas y llegan a la conclusión de que ninguno de los cuestionarios revisados valora creencias, actitudes y emociones de forma conjunta, por lo que su aportación integrando los tres aspectos en un único cuestionario se puede considerar relevante. A su vez, nos reflejan estas autoras que son escasos los estudios centrados en analizar las emociones en general en relación con las matemáticas, centrándose más los cuestionarios en aspectos más concretos como la ansiedad.

Por estas razones, nos decidimos a utilizar el Cuestionario de Dominio Afectivo en la RPM elaborado por (Caballero Carrasco, 2013) que integra tanto actitudes como creencias y emociones hacia la RPM, y cuya construcción, características y algunos resultados derivados de este último instrumento están a disposición en la publicación de (Caballero Carrasco, Guerrero Barona, & Nieto, 2014) y se centra en el dominio afectivo en las matemáticas en general.

2. Resultados

Tabla 1

Estadísticos descriptivos de los diferentes ítems

Ítem	N	Mín.	Máx.	Media	Desv. típ.
1. Casi todos los problemas de matemáticas se resuelven normalmente en pocos minutos, si se conoce la fórmula, regla o procedimiento que ha explicado el profesor o que figura en el libro de texto.	105	1	4	2,85	0,676
2. Al intentar resolver un problema es más importante el resultado que el proceso seguido.	105	1	4	1,55	0,650
3. Sabiendo resolver los problemas que propone el profesor en clase, es posible solucionar otros del mismo tipo si sólo les han cambiado los datos.	105	1	4	3,19	0,652
4. Las destrezas o habilidades utilizadas en las clases de matemáticas para resolver problemas no tienen nada que ver con las utilizadas para resolver problemas en la vida cotidiana.	105	1	4	2,30	0,735
5. Busco distintas maneras y métodos para resolver un problema.	105	1	4	2,91	0,748
6. Cuando se dedica más tiempo de estudio a las matemáticas se obtienen mejores resultados en la resolución de problemas.	105	1	4	3,23	0,724
7. Cuando resuelvo un problema suelo dudar de si el resultado es correcto.	105	1	4	2,93	0,750
8. Tengo confianza en mí mismo cuando me enfrento a los problemas de matemáticas.	105	1	4	2,50	0,867
9. Estoy calmado y tranquilo cuando resuelvo problemas de matemáticas.	105	1	4	2,57	0,783

Ítem	N	Mín.	Máx.	Media	Desv. típ.
10. Cuando me esfuerzo en la resolución de un problema suelo dar con el resultado correcto.	105	1	4	2,99	0,658
11. La suerte influye a la hora de resolver con éxito un problema de matemáticas.	105	1	4	1,76	0,791
12. Ante un problema complicado suelo darme por vencido fácilmente.	105	1	4	2,12	0,817
13. Cuando me enfrento a un problema experimento mucha curiosidad por conocer la solución.	105	1	4	2,78	0,784
14. Me angustio y siento miedo cuando el profesor me propone «por sorpresa» que resuelva un problema.	105	1	4	2,54	0,920
15. Cuando resuelvo problemas en grupo tengo más seguridad en mí mismo.	105	1	4	2,81	0,761
16. Cuando me atasco o bloqueo en la resolución de un problema empiezo a sentirme inseguro, desesperado, nervioso...	105	1	4	2,84	0,822
17. Si no encuentro la solución de un problema tengo la sensación de haber fracasado y de haber perdido el tiempo.	105	1	4	2,50	0,833
18. Me provoca gran satisfacción llegar a resolver con éxito un problema matemático.	105	2	4	3,56	0,553
19. Cuando fracasan mis intentos por resolver un problema lo intento de nuevo.	105	1	4	3,01	0,672
20. La resolución de un problema exige esfuerzo, perseverancia y paciencia.	105	2	4	3,46	0,572
21. En magisterio, he descubierto otras formas de abordar los problemas matemáticos.	105	1	4	3,10	0,827

3. Conclusiones

En los resultados obtenidos se puede apreciar, entre otras cosas, como prevalece la idea de que la RPM consiste en la aplicación de algoritmos y fórmulas matemáticos, de forma que, sabiendo resolver un problema, es posible resolver otros similares sólo cambiando los datos. Se resalta a su vez la creencia de que es importante dedicar tiempo al estudio de las matemáticas para mejorar la competencia en RPM y obtener mejores resultados.

En relación con las creencias sobre sí mismos, cuando resuelven un problema suelen dudar de si el resultado es correcto. Sin embargo, cuando resuelven problemas en grupo tienen más seguridad en ellos mismos que cuando lo hacen individualmente. Por otra parte, consideran que cuando se esfuerzan en la resolución de un problema suelen dar con el resultado correcto. Cuando se atascan o bloquean en la RPM suelen sentirse inseguros, desesperados, o nerviosos.

En general, les provoca gran satisfacción llegar a resolver con éxito un problema matemático. Finalmente, la formación recibida en el grado de magisterio, les hace descubrir otras formas de abordar los problemas matemáticos.

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El Programa de Acceso y Acompañamiento a las Carreras de Grado y Pregrado de la UNGS como iniciación al oficio de estudiante universitario

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Resumen

Atendiendo y considerando cuestiones como el derecho a la educación, de todos los ciudadanos que deciden formarse como profesionales y los problemas de la oferta de enseñanza que atraviesan los sistemas educativos, que no siempre logra brindar a los alumnos los saberes requeridos para los estudios superiores, la Universidad Nacional de General Sarmiento[1] (UNGS) diseña políticas académicas que procuran generar las condiciones que requieren los procesos mediante los cuales los sujetos que ingresan se van convirtiendo en estudiantes universitarios. Este pasaje entre niveles educativos —medio a superior universitario— supone una serie de cambios inherentes al tipo de institución a la que se ingresa Efectivamente, la Universidad se diferencia de otras instituciones educativas por los propósitos que persigue y su organización, a lo que en este caso se combina con el tipo de trayectorias escolares previas que predominan en gran parte de los jóvenes que llegan en busca de una formación profesional.

La UNGS despliega propuestas académicas a través de innumerables espacios y actividades, tendientes a generar un variado repertorio de experiencias formativas y ámbitos de orientación. Se destacan áreas institucionales como Bienestar Estudiantil, el Servicio de Orientación y Tutorías (Orientación Vocacional-Profesional; Circuito de Discapacidad; Tutorías individuales y grupales; Asesoramiento para la inscripción a las primeras asignaturas); el Programa de Becas.

En particular se presentará el Programa de Acceso y Acompañamiento a las Carreras de Grado y Pregrado recientemente elaborado por la UNGS que incluye, entre sus dispositivos, el Taller de Lectura y Escritura en las Disciplinas y un Taller Inicial Orientado. Este último promueve el encuentro con el conocimiento científico producido por las Ciencias Sociales, Humanas y Exactas, proponiendo secuencias didácticas que toman como punto de partida el sentido común que suele expresarse en los medios de comunicación y las redes sociales en torno de temáticas actuales.

Abstract

Attending and considering issues such as the right to education, of all citizens who decide to train as professionals and problems of the educational offer that the educational systems go through Exploring new fields through an academic approach of the teaching and learning that does not always manage to provide the students with the knowledge required for higher education, the National University of General Sarmiento[2] (UNGS) designs academic policies that seek to generate the conditions that they require the processes by which incoming subjects leave becoming college students. This passage between levels —medio higher education— involves a series of changes inherent to the type of institution that is entered into. Effectively, the University differs from other educational institutions for the purposes that he pursues and his organization, which in this case is combined with the type of previous school trajectories that predominate in a large part of young people who come in search of professional training.

The UNGS deploys academic proposals through innumerable spaces and activities, tending to generate a varied repertoire of formative experiences and orientation areas. Areas are highlighted institu-

[1] Se trata de una Universidad pública situada en la ciudad Los Polvorines, Partido Malvinas Argentinas, Provincia de Buenos Aires, Argentina, creada en el año 1993. Esta institución ofrece carreras no tradicionales y recibe estudiantes que en su mayoría son la primera generación que accede a estudios superiores.

[2] It is a public university located in the city Los Polvorines, Partido Malvinas Argentinas, Province of Buenos Aires, Argentina, created in 1993.

tions such as Student Welfare, the Guidance Service and Tutorials (Vocational-Professional Orientation; Disability Circuit; Individual and group tutorials; Advice for registration to first subjects); the Scholarship Program.

In particular, the Access and Accompaniment Program will be presented to Undergraduate and Undergraduate Careers recently developed by the UNGS that includes, among its devices, the Reading and Writing Workshop in the Disciplines and an Oriented Initial Workshop. The latter promotes the meeting with the scientific knowledge produced by the Social, Human and Social Sciences Exact, proposing didactic sequences that take as starting point the common sense that is usually expressed in the media and social networks around current issues.

1. El ejercicio del derecho a la Educación Superior

Enunciar que la educación es un derecho universal lleva implícito, para quienes así lo consideran, que todos y cualquiera que lo desee deben poder acceder —también— a la universidad y no sólo a los niveles educativos básicos, para recibir los conocimientos propios de cada formación profesional. Para que el ejercicio de este derecho no sea sólo la expresión de una idea reducida al plano discursivo sino algo posible, es indispensable ocuparse de los problemas involucrados, entre los cuáles uno fundamental es el del proceso mediante el cual un sujeto se convierte en estudiante universitario, especialmente cuando el camino previo no le brindó las herramientas que lo hagan llegar a la universidad en las mejores condiciones en términos de conocimientos y competencias.

El pasaje que los estudiantes realizan desde el nivel secundario hacia la universidad supone una serie de cambios para los cuales no siempre se han preparado. La escuela media en casi todos los sistemas educativos atraviesa una crisis muy profunda y su manifestación tiene su versión local en Argentina, en particular en el conurbano bonaerense de donde proviene la población que recibe la UNGS.

Entre los problemas implicados en la llegada de los estudiantes a la universidad se identifican aquí los vinculados con las condiciones académicas, es decir, los conocimientos con los que los estudiantes cuentan y los que no fueron adquiridos por lo general debido a que no se transmitieron durante el trayecto por la escuela secundaria. Otra de las cuestiones que no están del todo resueltas en los inicios de la vida universitaria es la decisión definitiva de la elección de la carrera. Un tercer aspecto es la necesidad de aprender la especificidad del oficio de estudiante en la educación superior.

La UNGS, desde su creación en 1993, intenta formular una propuesta académica que considere como principio el derecho universal a la educación superior de calidad a través diseñando diversos y estratégicos dispositivos para optimizar la formación de todos los que deciden realizar estudios superiores. Las primeras formas siguieron la idea de compensar y nivelar conocimientos en dos disciplinas consideradas entre muchos especialistas como indispensable para todas las profesiones: Matemática y Lecto-escritura, dado el déficit de la enseñanza del nivel secundario en la región.

2. Los dispositivos del Programa de Acompañamiento a estudiantes ingresantes

En base a numerosas revisiones, evaluaciones e investigaciones locales que permitieron entender mejor la complejidad del desafío que supone para una universidad inserta en una realidad con múltiples variables, esta institución ha decidido recientemente reformular la en-

trada a las carreras de manera tal que a la vez que se sostiene una instancia inicial común para todos los estudiantes que ingresan se ofrece un espacio que pone muy tempranamente a éstos en relación con un campo de conocimiento específico.

El espacio común, consistente en un Taller de lecto-escritura, es continuidad del anterior pero ahora con rango de materia de grado y que se ofrece en forma simultánea con un nuevo taller introductorio orientado. Así, se definen una cantidad de materias a cursar, su secuencia y se generan condiciones para apoyar y acompañar la trayectoria académica de los estudiantes intentando que ésta se corresponda con los mejores rendimientos posibles.

Estos primeros tiempos en la universidad han sido re planteados para transmitir el significado de estudiar en la universidad, qué acciones supone concretamente en cada campo de conocimiento. Esta etapa inicial es clave por varias razones, como ya se señaló es un momento de transición en el que todavía los nuevos estudiantes no han re significado su rol, no se han apropiado de la lógica en la que funciona este tipo de institución, no está firme la elección de la carrera en parte porque no se la conoce todavía. La situación presenta cierta fragilidad y a la vez inaugura unas formas de proceder, comunicarse, resolver que dejan huellas y trazan posibles caminos, si bien no determinantes, tampoco inocuos en cuanto a sus efectos, motivo por el cual requiere del mayor de los cuidados para potenciar su aprovechamiento.

Entonces, los dos espacios que integran el programa de acompañamiento a los estudiantes que ingresan, ahora directamente a las careras, son uno común a todos de lecto-escritura y uno orientado según se trate de carreras de Ciencias Exactas, Ciencias Humanas, Ciencias Sociales o Ciencias Experimentales.

El Taller de Lecto-escritura se propone seguir la relación entre la escritura y la lectura en términos de leer para escribir y escribir para leer. Además, abordar el trabajo sobre tomar apuntes, elaborar respuestas a consignas para ser evaluado, producir textos en forma individual y grupal yendo de lo simple a lo complejo en pos del desarrollo de la autonomía que se requiere en toda formación profesional.

En cuanto al Taller Inicial Orientado (TIO), además de no estar definidos específicamente en relación a una disciplina, se trata de un dispositivo considerado bifronte porque por una parte toma como punto de partida a los saberes previos y el sentido común con el que cualquier estudiante llega a la universidad para direccionarlo, organizarlo y sistematizarlo, y por la otra orientar ese saber de forma crítica y reflexiva. En definitiva, es un espacio de ingreso a la universidad y a través de éste a la disciplina elegida y la vida institucional, que considera al ingresante como alguien que proviene de la escuela secundaria y no ha recibido previamente educación superior.

Los TIOs buscan concentrar el interés en un campo de problemas particular e incorporar al estudiante a un modo de saber propio de una institución como la universidad, en este sentido implica dos interrogantes: ¿cómo introducir a los estudiantes en un tipo de trabajo intelectual respecto del campo general? Y ¿Cómo presentar a los estudiantes la lógica de la institución para obtener ciudadanía universitaria? La respuesta elaborada definió un dispositivo consistente en una serie de sesiones (entre 6 y 8) temáticas que los profesores a cargo de los TIOs seleccionan de un banco de propuestas o que producen siguiendo un conjunto de reglas y pautas. La secuencia se inicia con un disparador o escena que permita abrir un problema, para lo cual se necesita presentar un autor y realizar una lectura adecuada.

Entre los objetivos que los TIOs promueven uno es presentar a los estudiantes las "buenas" razones de estudiar ciertos temas e interactuar con otros que tienen distintos intereses pero con quienes comparten "el amor al conocimiento". Los talleres representan también una invitación a una forma de estudiar que supone la mayoría de las veces un "desandar" otras

maneras aprendidas en la escuela secundaria y que se alejan significativamente de las que se esperan y se necesitan en un ámbito de formación profesional.

En cuanto al sistema de acreditación los talleres tienen una instancia de evaluación con calificación cualitativa (aprobado o desaprobado) no puede aprobarse a través de la modalidad "libre", o sea sin cursarlo de manera presencial y no se lo reconoce por equivalencia con otra materia.

Otros aspectos que caracterizan los talleres es la relación cuantitativa profesor-estudiantes consistente en un profesor con grupos de no más de 35 estudiantes, pudiendo ser los docentes a cargo los mismos integrantes de la universidad o contratados *ad hoc.*

3. A modo de reflexión

La importancia de esta etapa inicial en la Universidad radica, como se ha sostenido anteriormente, en que se trata de un momento fundante de la relación entre los estudiantes ingresantes y todo lo que supone una institución destinada a la formación profesional.

Constituirse como estudiante universitario amerita detenerse a pensar y diseñar las estrategias que generen las mejores condiciones para lograrlo, sabiendo lo delicado que es el recorrido por esta instancia por tratarse de algo incipiente, desconocido y con más dudas que certezas para un joven que realiza el pasaje de una institución educativa —la escuela secundaria— a otra tan diferente como lo es la Universidad pública.

Pero, además, cuando se asume como posición política el derecho a la educación de calidad para todos los que desean alcanzar los estudios superiores en una Universidad pública el desafío es múltiple porque implica desplegar muchas acciones en simultáneo. En primer lugar, las que tiendan a garantizar el acceso, las trayectorias académicas acordes a los planes de estudio y la consecución de todas las experiencias formativas que se requieren en cada caso.

Asimismo, si la otra cuestión a sostener es una concepción de Universidad que además de entender a la educación como un derecho universal considera que también es su función aportar el conocimiento que produce a la sociedad es necesario que éste mantenga una relación directa con los problemas que no pueden ser abordados de otro modo.

Dicho de otro modo, valorar y conseguir una sociedad justa e igualitaria no puede perder de vista ninguna de las dimensiones que se han explicitado ni menos aún la necesaria articulación entre ellas, porque de lo que ofrecen las instituciones educativas dependen las oportunidades para los sujetos, de lo que se reflexiona colectivamente dependen los ajustes y transformaciones a fin de resolver lo que se considera importante para todos los integrantes de una sociedad.

El descubrimiento de sí mismo y de la Comunidad. La experiencia de Aprendizaje-Servicio (ApS) en el Programa de Liderazgo Ignaciano en la Pontificia Universidad Católica del Ecuador. PUCE

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Resumen

Este póster abordará los resultados del análisis preliminar de las narrativas contadas por el alumnado durante la experiencia de Aprendizaje-Servicio en el marco del Programa de Liderazgo Ignaciano —LULI— de la PUCE en Ecuador. El objetivo es determinar el modo en que esta experiencia revierte aprendizajes de importante significación para los estudiantes participantes. En este artículo, se aborda una descripción del Programa LULI en el contexto del ApS; la metodología desarrollada; los resultados; y finalmente la discusión y conclusiones.

Abstract

This poster presents the findings of the preliminary analysis of the narratives of the students involved in a Service-Learning experience within the Ignacian Leadership Program —LULI— of the PUCE University of Ecuador. The purpose is to determine the way in which these experiences have a significant impact on the learning of those students involved. In this article, a description of the LULI program within the Service-Learning context is described; the methodology developed is presented; following the findings are addressed; and finally discussion and conclusions are shared.

1. El Programa LULI en el contexto del ApS

El Programa de Liderazgo Ignaciano (LULI) de la PUCE-Ecuador[1], es un espacio de formación integral que desarrolla en los y las estudiantes competencias en el Sentido Sociopolítico-ambiental; Liderazgo y Sentido; e Identidad Ignacianas. El programa dura un año al término del cual, los estudiantes que libremente se comprometen, desarrollan una experiencia de servicio para poner en práctica sus aprendizajes, desarrollarlos e incorporar otros. Dicha experiencia se denomina Microproyecto Social *Luli en Servicio año XX* (corresponde al año de la promoción de LULI).

Dicho microproyecto, llamado así porque su duración es de entre 8 y 14 meses de ejecución, tiene lugar en la comunidad rural que acogió a los estudiantes durante el programa. En un primer momento, participan durante 3 días en dicha comunidad, lo que les permite cono-

[1] El Programa de Liderazgo Ignaciano es una iniciativa de la Asociación de Universidades confiadas a la Compañía de Jesús en América Latina —AUSJAL— como una respuesta a la formación ética y experiencial de los estudiantes de grado. En la PUCE se implementa desde 2008 con dos componentes: el programa (un año, con énfasis formativo) y el proyecto (con énfasis experiencial). Cada año se acoge una media de 15 estudiantes de 8 a 10 carreras.

cer actores, dinámicas, problemáticas y fortalezas de dicho territorio. Esto les es posible al recorrerlo, escuchar las historias de sus habitantes, dejarse sorprender por la acogida de personas a personas y aprender a levantar mapas de implantación del espacio, de hitos, de líneas de tiempo y de ciclos productivos, recursos psicosociales, entre otros.

Una segunda inserción, llamada Mayor, vincula a los estudiantes durante 8 días en actividades ligadas al servicio en espacios previamente definidos y que la comunidad orienta para incorporarse a ellos: el ámbito educativo, el trabajo cotidiano en campo, las actividades de la familia (pues una parte de dicha estancia —3 días— comparten con familias acogientes), las actividades de ocio, y las actividades que les conectan con sus pares de experiencia (viven otros 4 días con sus pares del programa), lo que refuerza los lazos de grupo y de amistad.

Al finalizar el programa, después del año de formación, se abre una nueva fase a la que se comprometen libremente. A esta fase la llamamos Microproyecto Social "Luli en Servicio" que moviliza a los y las estudiantes involucradas a asumir roles en un proceso que integra varios frentes: el proyecto, el equipo, el financiamiento, el trato con la comunidad, lo logístico y la responsabilidad de cumplir y rendir cuentas a varios actores; es decir el servicio.

Furco (2003) establece como criterio que el aprendizaje mejore el servicio y éste, a su vez, mejore el aprendizaje; por tanto, recogemos esto mismo en una serie de criterios que caracterizan Luli en Servicio como una iniciativa ApS:

1. Se sitúa en el contexto de una comunidad.
2. Desarrollan actividades que refuerzan y nutren los aprendizajes teóricos abordados en el programa, lo cual corresponde al aprendizaje.
3. Se abre la posibilidad a nuevos aprendizajes.
4. Se ejercita el sentido de la reflexión personal y grupal para tener conciencia de la propia experiencia individual y compartida.
5. Promueve la reflexión de los participantes, de modo sustancial, con los estudiantes que lo experimentan.
6. Se establece una relación de cooperación con la comunidad.

Es, en este espacio del microproyecto social, que los estudiantes se insertan en una dinámica que les sitúa ante un verdadero reto: volver a la comunidad que les acogió, pero en el microproyecto en una modalidad más sostenida y de mayor calado y significación tal cual lo señala Jacoby (2015), como características:

a) Aprendizajes sobre las dimensiones histórica, sociológica, cultural, económica y política de un contexto en donde subyacen las necesidades que abordan los estudiantes participantes.
b) Otros aprendizajes que son abordados por la naturaleza del programa de LULI y que tienen que ver con la dimensión espiritual o de trascendencia.
c) Un sentido de reciprocidad, donde se supera la brecha de las asimetrías en las consideraciones y relaciones, y en donde estudiantes y comunidad intercambian y aprenden.

Según Mendía (2012), el alumnado que se implica en proyectos de ApS desarrolla competencias de desarrollo personal, como la autoestima, la educación en valores y las habilidades para la vida. A su vez, adquieren competencias sociales, cívicas y de sentido ético. Entre el alumnado universitario, Lorenzo y Matellanes (2013) indican que hay un fomento de las competencias psicosociales, cívicas, cognitivas y emocionales.

En este sentido, el presente artículo recoge un análisis preliminar de las narrativas formuladas por los participantes de varias generaciones de LULI y encauzará como supuesto, en qué medida el desarrollo de aprendizajes en liderazgo social, responsabilidad social profesional y competencias prosociales han sido posibles a lo largo de la experiencia.

2. Metodología

Nuestro análisis parte de un enfoque cualitativo basado en narrativas en las que los estudiantes participantes y egresados del programa que han participado ya del microproyecto social, dan su testimonio sobre los aprendizajes más significativos registrados en su memoria.

Recogemos, por una parte, del grupo que ahora mismo lleva adelante su experiencia del Microproyecto social (generación 2018), por medio de dos preguntas abiertas, sobre lo que representa el proyecto al que se han comprometido y sobre los aprendizajes que, de modo inicial, sienten que van desarrollando. Y para aquellos que ya han vivido la experiencia, la formulación sobre lo que llevan en su memoria como el aprendizaje más significativo que recogen tras una mirada propia su experiencia. Estos dos componentes dan la oportunidad de contrastar expectativas de los que se inician con las miradas concluyentes de los que ya la han vivido.

Con respecto a la muestra, se ha contado con 7 estudiantes de la generación del 2018, que están en plena experiencia dentro del programa. Con respecto a aquellas personas egresadas, se han analizado 18 narrativas del siguiente alumnado: 1 (generación 2008); 1 (2014); 5 (2015); 7 (2016); 4 (2017).

3. Resultados

Recogemos los siguientes planteamientos como elementos conceptuales que describen las narrativas de los y las estudiantes, en términos de aprendizaje que experimentaron y rescatan del Microproyecto Social Luli en Servicio.

a) Generación 2018 (en curso de la experiencia):

— Microproyecto social:
En general, el alumnado en pleno desarrollo de la iniciativa, la asumen como un reto que les anima a tomar en cuenta, desde su propio compromiso, los siguientes elementos:

- El desarrollo como equipo y aliados en la causa.
- El desarrollo personal: habilidades de comunicación y de trabajo en campo y como parte de un equipo.
- El aprendizaje experiencial sobre en qué consiste un proyecto.
- La responsabilidad como persona y como profesionales ante sí mismos, el equipo, la comunidad y la Universidad.

— Aprendizajes que se van desarrollando:

- Sentido de responsabilidad.
- Reconocer los talentos propios y ajenos a la hora de enfrentar tareas del proyecto.

- Saber organizar el tiempo.
- Paciencia y habilidades de comunicación interpersonal.
- El desarrollo como equipo y aliados en la causa.
- El desarrollo personal.
- El aprendizaje de en qué consiste un proyecto.
- La responsabilidad como persona y como profesionales como dimensión del compromiso adquirido.

b) Generaciones anteriores:

— A nivel personal: autoconocimiento y autoconfianza. Ser la mejor versión de uno mismo para servir de la mejor manera.
— Desarrollo de habilidades de trabajo al interior de un equipo interdisciplinario.
— El encuentro con el otro: el compañero, las personas de la comunidad.
— El compromiso basado en valores y en la espiritualidad (identidad ignaciana).
— El conocer, humilde y realista, de lo que comporta un proyecto.
— Sentido de pertenencia a un proceso grupal movilizado por opciones de servicio y de entrega.
— Valoración de la experiencia de universidad desde lo integral.
— Resignificación del valor social de las profesiones: la dimensión social traspasa la vida misma y el ejercicio profesional.

4. Discusión y conclusiones

A la luz de los resultados, podemos afirmar que el espacio del Microporyecto Social Luli en Servicio es una experiencia de ApS traspasada por una parte, de servicio, donde el horizonte de responsabilidad con la comunidad es claro; y, por otra parte, por el aprendizaje donde se registran un conjunto de aprendizajes experimentados.

La trayectoria de esta experiencia no está marcada por un programa que se repite cada vez, mas sí por un proceso caracterizado por el tránsito del grupo de clase al equipo de trabajo. Es, justamente, este componente el que encuentra uno de los mayores aprecios de los testimonios recogidos, y aún más, al apreciarlo como tal también al contar con su dimensión interdisciplinaria. Esto significa aprender a escuchar y adecuar el discurso profesional para la búsqueda de opciones y el aporte de talentos, sean cuales fueren, con mayor o menor incidencia, pero aportando siempre al horizonte de servicio.

Desde una perspectiva amplia, los resultados de estas narrativas establecen el componente reflexivo como una constante en la que, desde y en el servicio, eleva a ejercicio de conciencia la incorporación de aprendizajes de todo orden. Esto concuerda plenamente con la característica propia del ApS que hace que una experiencia cuidadosamente monitoreada, con metas específicas de aprendizaje y su consecuente proceso reflexivo que permite recoger en los estudiantes sus propios aprendizajes, eso es precisamente ApS (Furco, 2003).

Estos elementos narrativos apuntan a ir tejiendo un proceso que compromete a los y las estudiantes en una dinámica que se va realizando de a poco, desde la toma de decisiones, el manejo presupuestario, las relaciones con la comunidad y sostener, hasta la rendición de cuentas, una nutrida comunicación con todos los actores.

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SoTL out of the box? Report and reflections on the first attempts of promoting SoTL in Tübingen

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Abstract

At the University of Tübingen, hardly anyone knows about SoTL. Due to growing heterogeneity in society and in academia, we believe in a future development of SoTL in Germany. We aim to support the movement by an innovative training for early career researchers. The "SoTL-Box" training took place in winter term 2018 as a pilot project and is going to be continued. We designed the training as a playful introduction into qualitative research, using black boxes as tools for data collection. The participants' feedback was mainly positive.

1. How I slowly "SoTLized" myself

Since February 2011, I have been working at the Geography Department and in October 2016, I received a position in the Center for Teaching and Learning. My current project aims for innovative teaching trainings for early career researchers. The funding will end in December 2020, as does the federal program it belongs to – a huge program called *Qualitätspakt Lehre*[1], funding projects at every university in Germany.

I heard about SoTL for the first time in 2016 at the ICED conference in Cape Town. Back in Tübingen, my search for German literature on SoTL lead me to Ludwig Huber, to whom every other author referred. Huber's first article on SoTL was published in 2011[2], but major impact had the book he co-edited in 2014.[3] In 2018, Ludwig Huber states that in the meantime SoTL could raise only little attention in German speaking academia.[4] I agree with him: For two years, I talked to many academics in Tübingen and only one person knew about SoTL.

During the ICED conference, I made acquaintance with Pieter du Toit, senior lecturer at the University of Pretoria. He visited Tübingen in June 2017 and conducted a workshop on SoTL as Action Research. This concept raised my interest also for its historic roots. Kurt Lewin introduced Action Research in 1946 as a way to solve problems between ethnic groups in America.[5] From my point of view, the growing heterogeneity both in societal and academic environments in Germany, eventually will lead to further development of SoTL. In the last decade, formerly marginalized milieus rushed into higher education. At the same time, research and teaching became more diverse and international. Faculties also in Germany ought to become a "mosaic of talent", as Ernest L. Boyer it coined in 1990.[6]

2. The design of the SoTL-Box training

How to set the stage for SoTL at the University of Tübingen? I decided to use a physical prop and I imagined a black box that may store all my reflections on teaching and learning. I constructed such a box with a thin slot for throwing index cards inside.

Presenting it to other university staff members, I made them write comments, gathered them together with my own ideas, reflections, drawings, quotes and other kind of data inside the box. After having tested the box by myself, I planned a SoTL-Box training and I started a collaboration with Katja Hericks, an expert for qualitative research. Together we conducted the training in winter term 2018/19. Each participant received a sealed box and performed a SoTL inquiry – as did Jo Laufenberg who engaged in writing this paper. The group met for one-day-workshops: first time in November to start with a question of interest; second time in February for opening the box, analyzing and interpreting the data. Additionally, we kept in touch via internet (e-mails, WhatsApp, Facebook). Occasionally we also met for lunch.

Throughout the SoTL-Box experience, we discovered three outcome that will help us improve our future research and training.

2.1. The box as a symbol of appreciation

The box represented our appreciation towards teaching and learning. Often I used the phrase "Teaching is an Adventure" for promoting the SoTL-Box training. This metaphor provoked such ideas as "personal development through challenges", "appreciation of human intelligence", "service to a greater mission", "unconscious motives and surprising insights", "teaching as a joint venture", "doubts about certainties and staying curious". During the process of data collection, we forgot about what was already inside the box. In the end, the box represented our responsibility as teachers. In order to stress this point, let me quote Graham Gibbs: "I regret the loss of focus on the affect and the lack of acknowledgement of the roles of passion, fear and pride in teaching. Some of the 'rush to scholasticism' seems to me to be a flight from feelings."[7]

2.2. The box as a tool to keep the process going

The box served as a tool to exercise qualitative research. It helped us connect with others but also reflect upon our own way of thinking and your feelings. Carrying around a black box raised curiosity among colleagues and students. Using the box as a tool strengthened our confidence in the quest for knowledge. We kept the box on the working desk and integrated it into our everyday working routine. The box accompanied us throughout the training and it reminded us continuously to gather a variety of data.

2.3. The box as "soil"

Twyla Tharp, a performance artist, uses similar boxes for every project as well. That is how she describes her sentiments: "That's how the box is soil for me. It's basic, earthly, elemental. It's home. It's what I always can go back to when I need to regroup and keep my bearings. Knowing that the box is always there gives me freedom to venture out, be bold, dare to fall flat on my face. Before you think out of the box, you have to start with a box."[8] Considering the box as "soil" may lead to processes such as "digging in its interior", e.g. searching for core categories within the data, or to "growing out of it", e.g. the emergence of a new concept.

3. SoTL out of the box in Tübingen?

Eight staff members took part in the pilot SoTL-Box training. The group proofed to have self-regulating capabilities: e.g. overcoming language barriers between participants, continuation of the training also in the absence of trainer due to illness. The training was inspiring for them, especially because they got in touch with other early career academics from different disciplines. Group discussions, social media and online communication were experienced as vivid, authentic and cooperative. Two participants mentioned that they missed some input on educational theory and that they would have needed more support analyzing the data. However, the authentic encounters and the playful introduction into qualitative research were highly valued.

From a bottom-up perspective, SoTL is out of the box now in Tübingen. However, SoTL needs more top-down support. For now, it remains uncertain how federal support for teaching and learning will continue after 2020. There is a chance for SoTL to gain more institutional backing, if strategies as proposed by the *Wissenschaftsrat*[9] or the *Stifterverband*[10] will be pursued.

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The effects of public policies on the professional development of the academic staff in higher education in France: a case study

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Résumé

Notre article rend compte des effets des politiques publiques de l'enseignement supérieur français sur la transformation pédagogique, institutionnelle et organisationnelle de l'université. A l'aide d'une étude de cas (la création du Centre de Ressources d'Initiatives et d'Ingénierie Pédagogiques à l'Université de Poitiers), nous analyserons les évolutions dans le développement professionnel des enseignants universitaires après la mise en place des actions de soutien à la pédagogie universitaire. Ces transformations témoignent d'un changement majeur dans la professionnalisation des enseignants et enseignants-chercheurs en France pour « faire évoluer l'architecture pédagogique et les pratiques des acteurs » (Bertrand, 2014) et améliorer la qualité des formations universitaires.

Abstract

This article reports on the effects of public policies in French higher education on the educational, institutional and organizational transformation of the university. Using a case study (the creation of the Resources Center for Initiatives and Pedagogical Engineering at the University of Poitiers), we will analyze the changes in the professional development of university teachers after the implementation of the support actions for teaching and learning activities. These measures reflect a major change in the professional development of teachers in the higher education system in France, with the long-term objective of changing the pedagogical architecture and the main actors' practices and improving the quality of university courses.

1. L'européanisation de l'Enseignement Superiéur

Nous ne pouvons pas parler du développement pédagogique des enseignants et enseignants-chercheurs français sans rappeler l'européanisation des cadres nationaux de l'enseignement et de la formation. Cette tendance a débuté dans les années 1980 et aboutit à la création d'un espace européen de l'enseignement supérieur « favorisant la mobilité intra-européenne » par le processus de Bologne (1999). Avec la Stratégie 2020, l'espace de l'enseignement supérieur européen avance encore plus vers l'accomplissement des objectifs communs (Stratégie Europe 2020) à travers d'une combinaison de mesures nationales, portant sur l'adaptation du cadre national, le renforcement de la qualité de l'enseignement supérieur et de la formation, la professionnalisation du corps enseignant, etc.

Les nombreux rapports ministériels[1] et missions d'évaluation qui se succèdent entre 2010 et 2019 remettent tous en question le modèle traditionnel de l'enseignement supérieur français associé à l'inadaptation aux nouveaux enjeux de formation et aux caractéristiques de la population étudiante. La question principale que tout le monde se pose : « Comment faire réussir des pu-

[1] Pour plus de références, veuillez consulter la liste bibliographique « Pour une société apprenante. Annexe au rapport pour la stratégie nationale de l'enseignement supérieur » réalisée par Prunelle Charvet, responsable de la veille et des études documentaires pour le comité StraNES en 2015

blics plus larges et plus diversifiés, que ce soit en réduisant l'échec des étudiants en difficulté, en donnant aux étudiants à fort potentiel la possibilité de le développer ou en ouvrant largement les dispositifs d'enseignement aux publics en formation tout au long de la vie ? » (Bertrand, 2014). Le Rapport de Claude Bertrand, publié en 2014 avait déjà identifié une possible réponse : « la transformation pédagogique de l'enseignement supérieur français est nécessaire afin de rompre avec la logique de transmission et de faire évoluer la structuration de l'offre de formation vers un modèle de formation centré sur les résultats d'apprentissage des étudiants ».

2. La transformation pédagogique en France

L'expression « pédagogie universitaire » garde « souvent une connotation négative et génère également des controverses qui opposent les contenus à enseigner à la façon de le faire » (Poteaux, 2013). Qu'il s'agisse de pédagogie universitaire ou de pédagogie de l'enseignement supérieur, tous les rapports recommandent la mise en place des formations à destination des enseignants ou des nouveaux enseignants-chercheurs soutenues par des actions de reconnaissance de l'investissement dans les activités d'enseignement à la même hauteur que les activités de recherche.

IDEFI paré et CRIIP

À l'Université de Poitiers, la transformation pédagogique a commencé en 2012, l'année de début d'un projet IDEFI Paré (Parcours Réussite) ayant pour ambition de favoriser la réussite des étudiants dans une perspective d'égalité des chances en renouvelant les pratiques pédagogiques. Inscrit dans une temporalité de 8 ans (2012-2019), le projet comporte 3 volets qui agissent en interaction étroite, dans une logique de renforcement mutuel et d'amélioration continue : un renforcement de l'appui aux étudiants, le renouvellement des pratiques pédagogiques et un aller-retour étroit avec la recherche.

La création du Centre de Ressources d'Initiatives et d'Ingénierie Pédagogiques (CRIIP) en 2014, vise 3 missions principales : favoriser le développement professionnel des enseignants, enseignants-chercheurs et des doctorants à travers l'accompagnement, le conseil, l'information et la formation en matière de pédagogie universitaire ; rendre visible la diversité des pratiques d'enseignement à l'université ; proposer des ressources utiles aux missions d'enseignement des enseignants du supérieur. Le principal axe d'intervention est le développement professionnel des enseignants. Le CRIIP met à leur disposition un ensemble d'outils pour leur permettre de s'engager dans une démarche de formation et d'amélioration continue dans le domaine de la pédagogie. Depuis sa création, le CRIIP est responsable de la mise en place annuelle d'un Plan de Formation pour le développement des compétences en pédagogie universitaire. Il s'adresse en priorité aux enseignants chercheurs, mais également à tout personnel ainsi qu'aux doctorants qui veulent se former en pédagogie universitaire.

Pour approfondir la réflexion autour du développement professionnel des enseignants-chercheurs, le CRIIP organise régulièrement des occasions de partage d'expériences dans la communauté des pratiques sous la forme de Lunchs pédagogiques ou des conférences et journées thématiques autour des questions liées à la pédagogie universitaire. Les activités formatives mises en place dans le cadre du plan de formation sont complétées par de nombreuses actions d'accompagnement et de conseil pour la mise en place des projets d'innovation dans les enseignements. Des ressources et des outils sont spécialement conçus par les ingénieurs de formation et de recherche du CRIIP afin de valoriser les initiatives

des enseignants mais aussi pour les accompagner dans la conception, la mise en place et l'évaluation des expérimentations pédagogiques.

3. Avancements législatifs

De son côté, le ministère lance en 2015 une consultation nationale des partenaires sociaux autour des modalités concrètes d'amélioration des conditions de travail dans l'enseignement supérieur. Un groupe de travail est dédié aux questions concernant les missions et le déroulement des carrières des enseignants. Le Décret n° 2017-854 du 9 mai 2017 qui met en place une formation initiale pour les nouveaux maîtres de conférences fait partie de leurs premières propositions d'action. Il est suivi d'un référentiel de compétences intitulé « Repères pour l'exercice du métier d'enseignant chercheur ». L'objectif de ce dernier document est notamment de « guider l'élaboration du contenu des formations initiales et continues dispensées aux enseignants chercheurs » mais aussi « aider à la cohérence entre les formations des jeunes enseignants-chercheurs la première année qui suit leur nomination et celle des cinq années qui suivront la titularisation »[2]. En parallèle, le ministère travaille sur plusieurs documents destinés à moderniser le cadre national législatif en accord avec les recommandations européennes pour l'amélioration de la qualité de l'enseignement supérieur[3] : la loi n° 2018-166 du 8 mars 2018 relative à l'Orientation et la Réussite des étudiants ; un nouveau arrêté relatif au diplôme national de licence[4] ; une concertation nationale entre 2018 et 2019 autour de la reconnaissance de l'engagement pédagogique des enseignants-chercheurs, des enseignants et des personnels de l'enseignement supérieur.

Références

Arrêté du 30 juillet 2018 relatif au diplôme national de licence.

Décret n° 2017-854 du 9 mai 2017 modifiant le décret n° 84-431 du 6 juin 1984 modifié fixant les dispositions statutaires communes applicables aux enseignants-chercheurs et portant statut particulier du corps des professeurs des universités et du corps des maîtres de conférences.

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[4] Arrêté du 30 juillet 2018 relatif au diplôme national de licence.

Los grupos interactivos como estrategia de mejora en la formación inicial de los futuros docentes de Matemáticas en el doble grado de CAFyD y Educación Primaria

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Resumen

El propósito de esta comunicación es presentar un proyecto de Tesis que se está realizando desde el Programa de Doctorado en Educación de la Universidad de Deusto. Su objetivo principal es analizar el efecto de Grupos Interactivos como estrategia de Enseñanza-Aprendizaje sobre las actitudes hacia las matemáticas y la identidad profesional en futuros maestros y maestras de Matemáticas de Educación Primaria.

Para ello, se tomará como muestra participante un grupo de estudiantes del Doble Grado en Ciencias de la Actividad Física y el Deporte y Educación Primaria (CAFyD + EP), que cursarán la asignatura de Matemáticas y su Didáctica durante un semestre del curso académico 2019-2020. Dicha muestra será dividida, a su vez, en dos subgrupos: uno cuasiexperimental, con el que se llevará a cabo semanalmente una sesión de Grupos Interactivos, y otro control, con el que se llevará a cabo la sesión correspondiente de la asignatura siguiendo la metodología convencional de trabajo.

Las hipótesis son las siguientes:

— La estrategia Grupos Interactivos genera una evolución en la imagen profesional de los futuros docentes de Matemáticas.
— La estrategia Grupos Interactivos produce una mejora en las actitudes hacia las matemáticas.

Para dar respuesta a estas hipótesis, se utilizarán una serie de instrumentos y técnicas, tanto de corte cuantitativo como cualitativo, que permitirán la recogida de información sobre las variables de estudio (identidad profesional y actitudes hacia las matemáticas) en distintos momentos de la investigación: entrevistas, metáforas y sus dibujos, cuestionarios y escalas.

Una vez analizados los resultados y obtenidas las conclusiones, como parte de las actividades de difusión y transferencia, se prevé la participación en seminarios con estudiantes en formación inicial del profesorado (grado y/o postgrado) así como la publicación de al menos un artículo en revista indexada.

Palabras claves: formación inicial, Grupos Interactivos, identidad profesional, actitudes hacia las matemáticas, Educación Primaria.

Abstract

The aim of this proposal is to present a Thesis Project, which is currently under development within the PhD Programme in Education at University of Deusto. Its main purpose is to analyze the effect of Interactive Groups, as a teaching-learning approach, on pre-service Mathematics teachers' attitudes towards mathematics and professional identity.

For that purpose, the research sample will consist of students from the double degree in Physical Activity and Sports Science and Primary Education, enrolled in the one-semester subject Didactics of Mathematics during the academic year 2019-2020. The student group will be divided into two subsamples. On the one hand, the quasi-experimental group, which will participate in Interactive Groups once a week; and on the other hand, the control group, which will continue receiving conventional lessons in the subject.

The research hypotheses are as follows:

— The strategy based on Interactive Groups provokes a positive change in the pre-service Mathematics teachers' professional identity.

— The strategy based on Interactive Groups has a positive effect on pre-service Mathematics Teachers' attitudes towards mathematics.

In order to gather information and data regarding the aforementioned variables (that is, professional identity and attitudes towards mathematics) several quantitative and qualitative instruments and techniques will be used in different measurement points during the project: interviews, methaphors and their drawings, questionnaires and scales.

Finally, results and conclusions will be disseminated through several transfer activities, such as the lecture in seminars aimed at pre-service teachers (from Degree and/or Master's degree) and the submission of at least one article to a indexed journal.

Keywords: pre-service teacher training, interactive groups, attitudes towards mathematics, Primary Education.

1. Justificación

Teniendo en cuenta que los estudios realizados utilizando Grupos Interactivos como estrategia, han obtenido resultados favorables en alumnos de educación primaria (Ordoñez-Sierra, Rodríguez-Gallego y Rodríguez-Santero, 2017), secundaria (Chocarro de Luis y Mollá, 2016) y en algunos estudios superiores (Sheryn y Ell, 2014), se puede considerar que los Grupos Interactivos propiciará un cambio en los futuros docentes de educación primaria respecto a identidad profesional y a sus actitudes hacia las matemáticas. Además, ambas variables están relacionadas por la componente afectiva de las actitudes hacia las matemáticas, la cual contribuye a la construcción de la identidad profesional (Aristulle y Paoloni, 2018).

2. Marco teórico

En este apartado se define la estrategia Grupos Interactivos, identidad profesional y las actitudes hacia las matemáticas.

2.1. Identidad profesional

La construcción de la identidad profesional es una de las metas educativas en la formación inicial de los maestros y maestras (Martínez-de la Hidalga y Villardón-Gallego, 2015).

Esta configuración de la identidad del profesor es un proceso dinámico en el que un docente construye y desarrolla de modo reflexivo, al observar su práctica y vida de enseñanza como un espejo (Palmer, 1997). Las prácticas educativas que se fundamentan en la reflexión, interacción y diálogo favorecen la construcción de diferentes puntos de vista holísticos sobre estudiantes, colegas, propósitos profesionales y circunstancias de la enseñanza (Beijaard, Meijer, y Verloop, 2004; Dillabough, 1999).

2.2. Actitudes hacia las matemáticas

Las diferentes concepciones de actitudes hacia las matemáticas recogidas en la literatura (Reyes, 1984) se nombran a continuación:

— Las reacciones emocionales ante un objeto, en este caso las Matemáticas, que pueden tener carga afectiva de carácter positivo o negativo.

— Comportamientos que el individuo identifica como propios, con los que se predispone a la realización de una tarea matemática.
— Creencias de una persona de realizar tareas matemáticas.

Por tanto, las actitudes hacia las matemáticas constan de tres componentes: afectivo (reacciones emocionales), conductual (comportamientos) y cognitivo (creencias). De este modo, la *Tabla 1* recoge los instrumentos más recientes encontrados en la literatura, que fueron diseñados y validados para la medición de actitudes hacia las matemáticas en muestras de diferentes características. Por cada uno de ellos, se señala, asimismo, qué componente o componentes son considerados en la correspondiente estructura factorial del constructo.

Tabla 1
Instrumentos más recientes para la medición de actitudes hacia las matemáticas

Instrumentos	Componente afectiva Interés	Componente comportamental Persistencia	Componente cognitiva Creencias	Muestra
Construcción y validación de una Escala de actitud hacia la matemática para estudiantes de psicología. (Auné y Attorresi, 2017).	x		x	Estudiantes de Psicología
Development and structural validation of the Scale for Assessing Attitudes towards Mathematics in Secondary Education. (Yáñez-Marquina y Villardón-Gallego, 2016)	x		x	Estudiantes de secundaria
Ansiedad, motivación y confianza hacia las Matemáticas en futuros maestros de Primaria. (Nortes y Nortes, 2016).	x		x	Estudiantes del Grado de Educación Primaria
The Mathematics Attitudes and Perceptions Survey: an instrument to assess expert-like views and dispositions among undergraduate mathematics students. (Code, Merchant, Maciejewski, y Thomas, 2016).	x	x	x	Estudiantes del Grado de Matemáticas
Attitudes Towards Mathematics: Construction and Validation of a Measurement Instrument. (Palacios, Arias, y Arias, 2014).	x	x	x	Estudiantes de primaria y secundaria
A Confirmatory Factor Analysis of Attitudes Toward Mathematics Inventory (ATMI). (Abdul, Gusti, y Lync, 2013).	x		x	Estudiantes de primaria y secundaria

2.3. Grupos Interactivos

La estrategia Grupos Interactivos es un modo de trabajar en el aula en el que los alumnos son agrupados formando grupos heterogéneos en cuanto a género, cultura, nivel de aprendizaje etc. En cada grupo existe la figura del voluntario, quien dinamiza el mismo fomentando la participación del alumnado (Chocarro de Luis, Sáenz de Jubera, 2016). Las evidencias recogidas en experiencias previas en aulas universitarias (Sheryn y Ell ; Fernández-

López, Lando-Sestayo y Otero-González, 2014) concretamente en el Grado de Matemáticas, pusieron de manifiesto que antes de llevar a cabo la experiencia con Grupos Interactivos, los estudiantes consideraban la falta de experiencia de los integrantes como un desafío, y manifestaban que podrían tener problemas con la personalidad de los miembros del grupo. Pero tras trabajar en Grupos Interactivos, los alumnos consideraron que este modo de trabajar incentiva el aprendizaje, puesto que todos los estudiantes intervienen, todos se sienten parte de la clase y aunque algunos estudiantes avancen más rápido que otros, el hecho de que los grupos sean heterogéneos permite que aquellos alumnos y alumnas que avanzan más rápido ayuden a sus compañeros y compañeras.

3. Objetivos

El objetivo principal de esta investigación es analizar el efecto de Grupos Interactivos como estrategia de Enseñanza-Aprendizaje sobre las actitudes hacia las matemáticas y la identidad profesional de futuros docentes que impartan Matemáticas en Educación Primaria.

Para tratar de abordar este objetivo se proponen los objetivos específicos siguientes:

— Analizar el cambio en la identidad profesional tras haber trabajado la estrategia Grupos Interactivos en los futuros docentes que impartirán Matemáticas en Educación Primaria.
— Analizar el cambio en actitudes hacia las matemáticas tras llevar a cabo la estrategia Grupos Interactivos en los futuros docentes que impartirán Matemáticas en Educación Primaria.
— Analizar el efecto de los Grupos Interactivos sobre la identidad profesional en los futuros docentes que impartirán Matemáticas en Educación Primaria en el grupo experimental y en el grupo control.
— Analizar el efecto de los Grupos Interactivos sobre las actitudes hacia las matemáticas en el grupo experimental y en el grupo control.
— Analizar el cambio de imagen de los futuros docentes que impartirán Matemáticas en los voluntarios que tomen parte en la intervención educativa con los Grupos Interactivos.

4. Metodología

Esta investigación presenta una metodología mixta y adopta un diseño de estudio de caso. Se combinan la dimensión cualitativa y cuantitativa

La muestra estará constituida por el alumnado del tercer curso del Doble Grado en Ciencias de la Actividad Física y el Deporte y Educación Primaria (CAFyD + EP) de la Universidad de Deusto. Se trabajará en la asignatura "Matemáticas y su didáctica III" durante un semestre del curso académico 2019-2020.

Por su parte, también tomarán parte en la investigación voluntarios y voluntarias que formarán parte de los Grupos Interactivos.

El análisis de cambio en las variables de estudio en el presente proyecto (esto es, identidad profesional y actitudes hacia las matemáticas) se realizará por medio de los siguientes instrumentos:

— Entrevistas para poder analizar la evolución de la identidad profesional. Se realizarán preguntas abiertas referidas a las emociones porque constituyen una parte importante

de la identidad profesional (Zembylas, 2003). La entrevista se realizará en ambos grupos (control y experimental) tanto al inicio como al final de la intervención con Grupos Interactivos.

— El análisis a través de las entrevistas para analizar la evolución de la identidad profesional se verá complementado con el empleo de la metáfora y el dibujo, que se realizará de manera individual, obteniéndose así la imagen que los estudiantes tienen del profesor o profesora de Matemáticas, tanto al comienzo como al final de la puesta en práctica de Grupos Interactivos.

— Cuestionario para medir las actitudes hacia las matemáticas. El grupo experimental y el grupo control responderán a una serie de preguntas clasificadas según las tres dimensiones estudiadas.

5. Análisis

Se realizará análisis cuantitativos y cualitativos siguiendo un método inductivo (haciendo categorías en base a las respuestas obtenidas) y deductivo siguiendo resultados ya obtenidos por otros investigadores.

Se determinarán conclusiones según la estadística descriptiva, la frecuencia, porcentaje, medidas de centralización y medidas de dispersión que caractericen los diferentes factores medidos. Las metáforas se agruparán formando subcategorías en cuanto al grado de efectividad, orientación y formación.

Las herramientas que se utilizarán para el tratamiento de datos serán el programa SPSS, utilizado para elaborar el análisis estadístico descriptivo y para el análisis del contenido de carácter cualitativo se utilizará el ATLAS.ti.

6. Resultados y conclusiones

Tras el análisis de los resultados y su discusión en base a las evidencias de investigaciones previas tanto relativas a identidad profesional, actitudes hacia las matemáticas y Grupos Interactivos, se llevarán a cabo actividades de difusión de las principales conclusiones del proyecto, con la presentación de comunicaciones y/o la publicación de artículos en revistas científicas.

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El desarrollo profesional docente a través de un estudio del programa de Formación e Innovación Docente del Profesorado de la Universidad de Sevilla

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Resumen

Desde el curso 2013/2014 se viene desarrollando en la Universidad de Sevilla un programa de formación del profesorado orientado a la mejora de su propia práctica. Este programa, que está consolidado a día de hoy, se conoce como "Programa de Formación e Innovación Docente del Profesorado Universitario" (FIDOP) y se desarrolla en varias etapas. En ellos, los formadores no transmiten teóricamente cómo ha de realizarse un Ciclo de Mejora Docente (CMD), sino que conducen y acompañan a los participantes en un trabajo que consiste en la descripción de sus clases, de las actividades que realizan, la reflexión sobre su modelo metodológico habitual y el planteamiento de un modelo metodológico que posibilite las mejoras de su docencia. Paralelamente al desarrollo de este programa formativo, se están investigando sus resultados en el marco del Proyecto I+D+i *La Formación Docente del Profesorado Universitario. Progresos y Obstáculos de los Participantes en un Programa Basado en Ciclos de Mejora de su Práctica* (EDU2016-75604-P).

Abstract

Since the 2013/2014 academic year, the University of Seville has been developing a teacher training programme aimed at improving their own practice. This programme, which has been consolidated, is known as the "Teacher Training and Innovation Programme for University Teachers". (FIDOP) and is developed in several stages. In them, the trainers do not theoretically transmit how an Teaching Improvement Cycle (CMD) should be carried out, but they lead and accompany the participants in a work that consists of the description of their classes, of the activities they carry out, the reflection on their usual methodological model and the approach of a methodological model that makes possible the improvements of their teaching. In addition, they question the way they approach and formulate the contents and forms of evaluation, discuss the changes to be introduced and design innovations, apply them and analyse them together.

1. Introducción

Los trabajos científicos sobre las habilidades de los docentes universitarios afirman que carecen de aquellas competencias necesarias para realizar adecuadamente sus tareas de enseñanza y tienen muy poco conocimiento sobre prácticas de enseñanza efectivas (Amundsen & Wilson, 2012). Por otra parte, en España, distintos trabajos nos muestran que el porcentaje de profesores que utilizan el método tradicional sigue siendo mayoritario, a pesar de que la enseñanza centrada en el estudiante parece más eficaz (Zabalza, 2007).

Ante este panorama, el programa FIDOP, a través de su Curso General de Docencia Universitaria, promueve la reflexión de los docentes participantes sobre su propia práctica, diseñando y experimentando CMDs progresivamente más amplios. Durante este tiempo los participantes en el programa describen sus clases, analizan la metodología y actividades que realizan, reflexionan sobre su modelo metodológico habitual y plantean un modelo metodológico que posibilite la mejora de su docencia; realizan lecturas sobre experiencias e investigaciones de otros profesores, cuestionan la manera que tienen de abordar y formular los

contenidos, las formas de evaluación; debaten sobre los cambios a introducir, diseñan innovaciones, las aplican y las analizan en común. Se establece desde el principio una interacción e intercambio provechoso y enriquecedor entre la orientación del formador y la autonomía del participante, que están presentes a lo largo de todo el proceso formativo y de investigación e innovación docente.

2. Método

Dentro de los objetivos generales del citado proyecto de investigación, este estudio se centra en las concepciones de los participantes en la dimensión profesional para caracterizar las concepciones del aprendizaje que tienen los profesores, las concepciones sobre la propia disciplina y el papel que esto desempeña en la docencia, así como su identidad profesional. Los participantes en la investigación han sido 49 profesores de la Universidad de Sevilla, 32 mujeres y 17 hombres, que desarrollan su docencia en distintas facultades y escuelas, de los cuales 23 han recibido alguna formación pedagógica.

Los resultados que presentamos aquí se basan en el análisis de los datos de un cuestionario abierto, elaborado a partir de los ítems de diversos cuestionarios validados y ampliamente utilizados en investigaciones anteriores. En el análisis de los datos se ha seguido una metodología de *análisis del contenido,* en la línea que plantean Krippendorff (2004) y Polit & Beck (2006). El objetivo ha sido elaborar y categorizar unidades de significados a partir de inferencias válidas y replicables. Para gestionar tal tarea, nos hemos servido del programa Atlas.ti versión 8. Cada uno de los 9 investigadores, implicados en el proyecto, ha realizado una codificación por separado y, posteriormente, se han discutido los resultados para triangular y establecer consensos (Patton, 2002).

La codificación de las unidades de información se ha organizado a través de un sistema de categorías apriorístico que contempla una hipótesis de progresión con tres valores (Martínez y Martínez, 2012) (Tabla 1).

Tabla 1

Sistema de categorías e hipótesis de progresión

Categoría de análisis	Valor 1 Modelo centrado en la enseñanza	Valor 2 Modelo de transición	Valor 3 Modelo centrado en el aprendizaje
Concepciones sobre el aprendizaje (CA)	Los estudiantes no tienen ideas sobre los contenidos y las que tienen son erróneas. Aprender es apropiarse del conocimiento científico o sustituir las ideas erróneas por el conocimiento verdadero.	Los estudiantes sí tienen ideas y modelos mentales que hay que ayudar a evolucionar, aunque no sobre todos los contenidos, pues hay algunos que son muy complejos.	Aprender es hacer evolucionar los sistemas de ideas de los estudiantes hacia niveles de conocimiento de mayor complejidad.
Concepciones sobre la propia disciplina (nivel epistemológico (CPD)	Concepción absolutista del conocimiento, que se concibe como una verdad incuestionable y estática.	Crisis de la concepción absolutista. Adquiere importancia la historia de la disciplina y sus implicaciones sociales.	Concepción relativista del conocimiento basada en la evolución histórica y social de la disciplina.
Identidad Profesional Docente (IPD)	Se identifica profesionalmente con su disciplina de referencia.	Docencia e investigación tienen el mismo valor y son complementarias o interactivas.	Se siente identificado con su desarrollo profesional como docente.

Fuente: elaboración propia.

3. Reflexión y resultados

En la categoría concepciones sobre el aprendizaje (CA), un 80.95% de las unidades de información está en valor 1 de la hipótesis de progresión, un 19.04 % está en el valor 2 y ninguno responde al valor 3, es decir, a un modelo de enseñanza centrado en el aprendizaje.

Los docentes centrados en la enseñanza consideran que los alumnos por sí solos no aprenden porque no tienen recursos, o su nivel de partida es cero, y si aprenden el conocimiento es erróneo y debe ser corregido. Sin embargo, hay profesores y profesoras que dan mayor participación al alumnado y establecen distintas transiciones entre la clase magistral y una clase activa, es decir, están en el valor 2 de la hipótesis de progresión, entre un modelo centrado en la enseñanza y un modelo centrado en el aprendizaje, con actividades que permiten una reflexión crítica por parte del alumnado, aunque siempre prevalece la trasmisión teórica de los contenidos para garantizar el proceso de enseñanza y aprendizaje.

En la dimensión de análisis sobre la propia disciplina (CPD) encontramos 62.95% de unidades en el valor 1, 18.55% de valor 2 y 18.55 % de valor 3. Por tanto, hay un claro predominio del valor inicial de la hipótesis de progresión. El valor 1 de la hipótesis de progresión representa una concepción absolutista del conocimiento, en el que se otorga escaso interés a su evolución histórica y se tiende a una identificación con la verdad científica. En el valor 2 de la hipótesis de progresión, se admite la complejidad del conocimiento y la posibilidad de distintas perspectivas epistemológicas. En cuanto al valor social del conocimiento, se describe en términos de utilidad, eficacia y aportación al progreso. En el valor 3, encontramos una visión relativista del conocimiento como una construcción social e histórica.

De las concepciones sobre la identidad profesional, el 51.16% son de valor 1, 26.7 % son de valor 2 y 22.09 % de valor 3 en la hipótesis de progresión. En el valor 1 predomina una identificación con la investigación, como vocación y campo profesional preferente. En el valor 2 de la hipótesis de progresión empezamos a encontrar unidades de información que denotan una valoración de la docencia como actividad profesional interesante y motivadora, aunque lastrada por distintos condicionantes como la escasa valoración académica, la falta de tiempo, el desgaste psicológico del trato con el alumnado, etc. Finalmente, en el valor 3 de la hipótesis de progresión, encontramos una clara identificación con la docencia, como actividad motivadora y útil desde el punto de vista social y académico.

Agradecimientos

Este trabajo es resultado parcial del Proyecto I+D+i “La formación docente del profesorado universitario. Progresos y obstáculos de los participantes en un programa basado en ciclos de mejora de su práctica” (REF: EDU2016-75604-P) financiado por el Ministerio de Economía y Competitividad de España.

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What interactions are desirable in HEIs' informal learning context? Perspectives from and experiences of university students

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Abstract

The project presented in this paper was piloted to explore how to nurture an integrated community of students and staff that cultivate intercultural interdisciplinary dialogues and peer support on campus. GLAM (Gameful Learning at Medway) is an inter-institutional project co-designed and run by both academic and professional services staff from the three Universities at a shared campus. GLAM aims to enhance students' critical skills and employability through a playful approach. In our data analys, we have categorised all the gameful/playful activities we have delivered in the past academic year. There are 5 categories: engagement, play&build, collaboration, discussion and self-retrospection. The characteristics of each activity type and its pre-dominant interaction pattern were identified.

1. Introduction

International students' enrollment in UK universities has expanded significantly in the last decade. They contribute to the diversity and internationalization of their classrooms, campuses, and communities. According to the Contact Hypothesis theory, contact between members of different groups (under certain conditions) can work to reduce prejudice and intergroup conflict (Everett, 2013). Yet, an empirical study of 26 UK universities revealed that the greater the proportion of non-UK students in the total student population, the less positive the student experience ratings are. This finding highlights the need for actions to nurture a more integrated community of students and staff that enriches the university's intellectual environment and nurturing students' global skills.

Furthermore, the WONKHE report (2019) on university students' experiences of loneliness revealed that over 15% of students said that they felt lonely on a daily basis and another 32.7% said they felt the same weekly. The figures were worse for international students, disabled students and BAME students. The students in this report made practical suggestions such as having more non-drinking events to allow people that do not drink to socialize with each other; helping students to create groups for study and topic discussions so that they are not left to study alone, etc. Littleton and Häkkinen (1999) called for 'a fuller understanding of the cultural context of peer interactions and learners' social perceptions and emotional responses'. These suggestions point the need for university staff and researchers to understand the participation and interactions of university students (i.e. student engagement) in informal learning contexts. To gain such understanding, we need to

design, implement and evaluate events that aim to cultivate intercultural interdisciplinary dialogues and peer support on campus.

2. The GLAM (Gameful Learning @Medway) project

The project presented in this paper was piloted to explore how to nurture an integrated community of students and staff that cultivate intercultural interdisciplinary dialogues and peer support on campus. GLAM (Gameful Learning at Medway) is an inter-institutional project co-designed and run by both academic and professional services staff from the three Universities at Medway (University of Greenwich, University of Kent and Canterbury Christ Church University). The project presents an innovative, cross-cultural approach to introducing Medway students across a range of disciplines to critical thinking and employability skills through a series of scaffolded playful dialogues and games.

GLAM aims to enhance students' critical skills and employability through a playful approach (Aguilar *et al.*, 2015) developed and led by students and supported and facilitated by educational experts. The project, currently piloted, unfolds throughout the academic year 2018/19 and allows international and home students to come together and work on overarching, cross-disciplinary skills from different cultural perspectives (Byram *et al.*, 2001) in an inclusive environment. The key aspect of the project is the partnership between students and staff (Bryson, 2016). Participating students also train to become mentors for future cohorts.

Diagram 1 shows the themes covered in the GLAM project (2018-2019):

Gameful Learning Session 1	GLOBAL PERSPECTIVES: NEW FRIENDS, NEW IDEAS *Knock! Knock! Who is there?*
Gameful Learning Session 2	PROBLEMS AND SOLUTIONS AT UNI Who can help?
Gameful Learning Session 3	IT'S ALL ABOUT YOU! CONTEXTUALISE YOUR CRITICAL THINKING *Is there just one answer?*
Gameful Learning Session 4	ASSIGNMENT AND FEEDBACK *What DO they mean?*
Gameful Learning Session 5	THE MYSTERIOUS INGREDIENT *How to develop your original ideas?*
Gameful Learning Session 6	REAL-LIFE SKILLS: IDENTITY AND CRITICAL THINKING *Who am I and where am I going?*
Gameful Learning Session 7	APPROACHING EXAMS, FIGHT BACK! *It's the final countdown, what will you do?*

We met the students seven times over two terms. A Student mentor for the future cohort was involved in a preparation meeting before each session. Staff and students work together to identify the different understanding and experience of the themes. They brainstorm what are the best games and activities to deliver in the workshop in order to deepening the discussion and seeing it from different perspectives. A final programme of gameful activities

for each session was agreed between staff and the student mentor. The session then was facilitated by staff with the support of the student mentor.

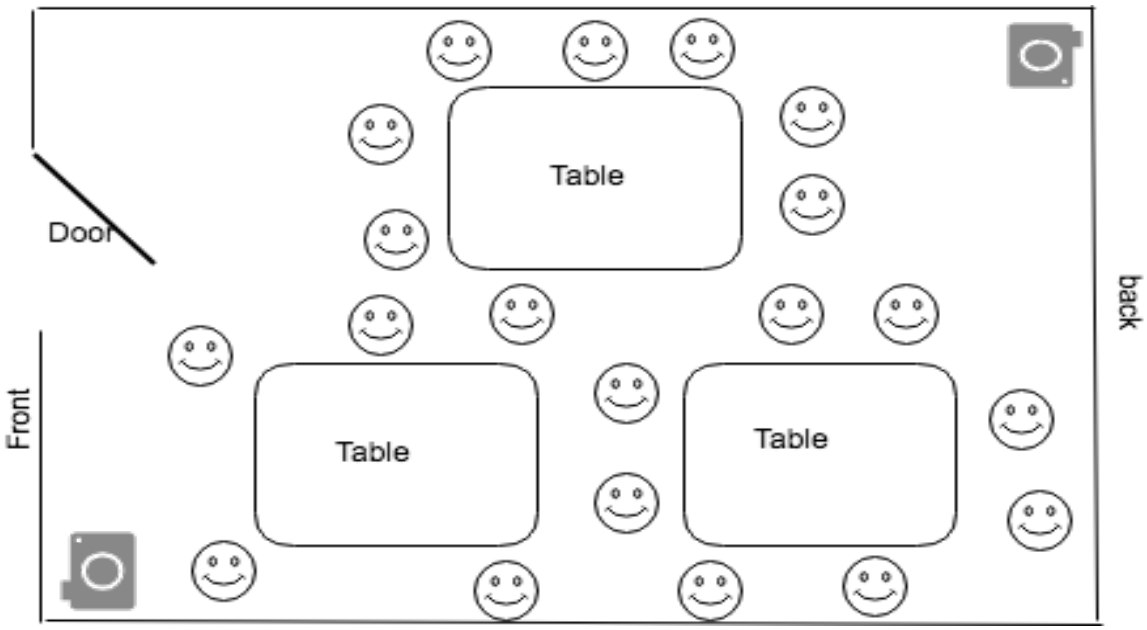
3. Research questions

RQ1: What are the interaction patterns amongst students and staff that emerged over the GLAM sessions?

RQ2: What are the factors that encourage or discourage our students to attend GLAM sessions?

4. Methods

With the University Research Ethical Approval, we have video recorded all the sessions based on an opt-in procedure. The sessions are open to all students at Medway and their attendance is on a voluntary basis. The videos captured were used to analyse the interaction patterns. Below is the setup of the video cameras in the venue:



In the end of the project, we have conducted semi-structured interviews with participating students who would like to be mentors for the future cohort.

5. Preliminary Findings

We have categorised all the gameful/playful activities we have delivered over the seven sessions as shown in table 2. There are 5 types of activities, and we have defined this categorisation by highlighting their prominent characteristics and in the last column of Table 2, the predominant interaction pattern of each activity type was proposed, based on observations.

Type of activity	Characteristics of the activity type	GLAM activities	Predominant interaction patterns
Engagement	This type of activities focuses on engaging every student ***equally*** on topics/ information/news that are **relevant to everyone**.	— Line up according to birth date — Describe yourself in 3 words	Everyone is involved, Turn taking to answer the same question, with one to one small talks to verify the understanding of the task.
Play & Build	This type of activities focuses on ***individual spontaneity and voluntary imagination*** within a group. It requires little planning ahead, but emphasis on improvisation and group ***meaning making afterwards, without value judgement***.	— Making car model with Lego and playdough in a context of exploring what is originality — Making paper tower to explore what constitute your ideal society — Color code your exam revision map	Mainly everyone is involved. Action coordination with gesture (e.g. pointing, leaning towards each other), facial expression (eye contact and nodding) and direction of shared artefacts.
Collaboration	This type of activities focuses on ***maximizing the interactions*** amongst individuals with a shared group goal/outcome. It aims to build a ***sense of togetherness and competence***.	— Group mind-mapping — Group real-life problem solving	Mainly everyone is involved, one or two persons are actively leading the task.
Discussion	This type of activities focuses on revealing the ***value of sharing individual views*** on what they are concerned. Different from "engagement", it emphasize on the complexity of the issues in the university life.	— Discussions on video clips on "a biased interview between King Philips and a female journalist" — "How to demonstrate originality" — Pause for thoughts: Theories collage (with a dice) — Funky Facts	Mainly one or two students led the discussions and the staff needs to pick up the discussion to involve more Chinese students
Self-retrospection	This type of activities focuses on ***verbalizing feelings*** towards things, before verbalizing or evaluating how things were done individually.	— "Feelings in a conflict" — "Criteria of assessment" — "Clarity of feedbacks" — Why you are who you are	Everyone are engaged equally through the anonymous discussion.

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Una experiencia colaborativa: Proyecto Transversal Multidisciplinar (PTM) "De la Naturaleza a la Farmacia"

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Resumen

Durante los últimos años, y en consonancia con la integración del sistema educativo español dentro del Espacio Europeo de Educación Superior (EEES), han surgido nuevos modelos de enseñanza-aprendizaje. Estas metodologías deben ir encaminadas a la adquisición de las competencias específicas y genéricas y permitir, tras su aplicación, la medida de su impacto en la formación del alumno.

Considerando este escenario, durante el curso 2014-2015, en el Grado en Farmacia, se puso en marcha el Proyecto Transversal Multidisciplinar (PTM), una experiencia de aprendizaje multidisciplinar. El proyecto implicaba a tres asignaturas del primer curso del grado en Farmacia (Biología Vegetal, Química Orgánica y Habilidades y Competencias de la Persona (HCP)) y su objetivo consistía en promover el desarrollo interdisciplinar de las competencias específicas y genéricas del estudiante mediante la realización de un trabajo científico real.

Abstract

The integration of the Spanish educational system into the European Higher Education Area (EHEA) has involved the emergence of new teaching-learning models in recent years. These new methodologies must ensure the acquisition of both specific and generic competences and, after its application, their impact should be able to be measured through learning results.

Considering the above-mentioned points, during academic year 2014-2015, it was resolved to start a pilot cross-curricular experience (Cross-cutting Multidisciplinary Project: CMP). This cross-curricular approach implied the collaboration of teachers from various subject areas of the first year of the Francisco de Vitoria University Degree in Pharmacy. The CMP consisted on the perform of a scientific work by the students in which they apply, in a cross-curricular way, the acquisition of the competences from Plant Biology, Organic Chemistry and Personal Skills and Competences (HCP) subjects, leading them to understand the integration of the different types of knowledge in a real scientific work.

1. Introducción

El EEES, y en concreto, el Proyecto *Tuning*, recoge la necesidad de que la universidad forme en competencias específicas (propias de cada área o titulación) y genéricas (comunes a distintas materias o titulaciones) (1-3). Además, la adquisición de competencias personales (propias a la persona, independientemente del ámbito de desarrollo) es un punto de vital importancia en la formación integral del estudiante (4). Con el fin de abordar con éxito esta nueva dimensión del aprendizaje, actualmente se emplean en el aula metodologías novedosas de enseñanza (*flipped-classroom*, *e-learning*, etc.). Sin embargo, su aplicación genera una gran cantidad de trabajo atomizado que desmotivan al estudiante y que le impiden ver la relación entre las diferentes materias.

Por ello, desde el grado en Farmacia, se planteó la realización de una experiencia de aprendizaje multidisciplinar para los alumnos: el Proyecto Transversal Multidisciplinar (PTM). Este proyecto implicaba a tres asignaturas de primer curso del Grado en Farmacia y

del Doble Grado Farmacia+Biotecnología (Biología Vegetal, Química Orgánica y Habilidades y Competencias de la Persona (HCP)) y su objetivo era el desarrollo interdisciplinar de competencias específicas y genéricas mediante la realización de un trabajo científico real (5).

El proyecto piloto se implantó en el curso 2012-2013 y se mantuvo durante los dos cursos siguientes. Los resultados que aquí se presentan hacen referencia a estas dos últimas ediciones.

2. Objetivos y metodología

El objetivo final del PTM consistía en generar una experiencia de aprendizaje integradora que incluyera el desarrollo de las competencias generales y específicas.

Los objetivos específicos que se pretendía trabajar eran:

- Que el alumno entendiera la relación entre las distintas disciplinas y asignaturas en su desarrollo como futuro profesional.
- Que el alumno experimentara el trabajo en equipo, y fuera consciente de como unos buenos resultados (eficiencia) y clima (positividad), permiten conseguir un verdadero trabajo colaborativo.
- Que el alumno aprendiera a exponer los resultados de un trabajo científico (memoria escrita y exposición oral), empleando las metodologías y herramientas adecuadas.
- Que el alumno fuera capaz de defender un trabajo científico ante un tribunal.
- Promover nuevas metodologías de aprendizaje interdisciplinar en la comunidad universitaria.

El PTM constaba de tres fases de trabajo:

1. **Fase I: Constitución de los equipos de trabajo.** Desde la asignatura de HCP y teniendo en cuenta los estilos temperamentales de cada alumno, se creaban los equipos de trabajo.
2. **Fase II: Elección de la planta objeto de estudio (de la naturaleza)**, de entre las propuestas, para su posterior análisis e investigación en la materia Biología Vegetal, empleando los conocimientos propios de esta asignatura.
3. **Fase III: Elección de la molécula orgánica (a la farmacia)**, en relación con la planta objeto de estudio, y posteriormente, realización de la retrosíntesis y síntesis de dicha molécula, utilizando para ello los conocimientos propios de Química Orgánica.

Como elemento clave, a lo largo de todo el proyecto, los equipos de trabajo debían poner en juego todas las competencias personales transversales objeto de la asignatura HCP, como gestión del tiempo, trabajo en equipo, resolución de conflictos, liderazgo y comunicación.

Al final del semestre, y una vez concluido el PTM, cada equipo presentó:

- una memoria escrita entregada en el aula virtual (AV) del PTM;
- una exposición oral, con su correspondiente defensa ante un tribunal multidisciplinar.

El plan de trabajo para la ejecución del PTM constaba de:

1. Presentación de la Guía del Proyecto, dónde se detallaban toda la información y herramientas relevantes para su ejecución.

2. Constitución de equipos de trabajo (4-6 alumnos), atendiendo a los tipos temperamentales, para asegurar la complementariedad entre los miembros del equipo.
3. Presentación de propuestas de proyecto (listado de plantas) a través de una actividad tipo *Wiki* en el AV del PTM.
4. Inicio del proyecto. Seguimiento continuo por los profesores implicados vía tutorías (obligatorias y secuenciales). Cada equipo recogía su desarrollo del PTM presentando actas de reuniones.
5. Entrega de la memoria escrita del proyecto.
6. Presentación y defensa del PTM. Para su valoración se emplearon rúbricas previamente consensuadas (*Tabla 1*).
7. Valoración del impacto del PTM por el alumnado (*Tabla 2*).

Tabla 1

Rúbrica empleada para la valoración de la memoria escrita

EQUIPO:				
PUNTUACIÓN FORMATO GENERAL:				
Tiene todos los epígrafes	No (0) / Sí (0,5)			
Hay leyenda en tablas y figuras	No (0) / Sí (0,5)			
Las figuras y tablas se citan en el texto	No (0) / Sí (0,5)			
El trabajo está ordenado y estructurado	No (0) / Sí (0,5)			
Hay faltas tipográficas	SÍ (0) / No (0,5)			
Bibliografía citada correctamente	No (0) / Sí (0,5)			
Redacción	Hay fallos graves (0)	Fallos ligeros (0,5)	Redacción correcta y se entiende bien (1)	
Resumen	No es un resumen o no tiene que ver con el trabajo (0)	Resumen de intenciones, pero no lo tratado en el trabajo (1)	Verdadero resumen que incluye lo tratado en el trabajo (2)	
Introducción	No habla del objeto de trabajo, solo lista lo que se va a desarrollar después. (0)	Incluye el objeto de trabajo y su interés, pero no aporta datos. Puede no haber objetivos (1)	Incluye el objeto de trabajo, su interés, aporta datos para comprender su importancia e indica objetivos del trabajo (2)	
Conclusiones	No son conclusiones, sino un resumen (0)	Son conclusiones no sobre el objeto de trabajo sino sobre el PTM (1)	Son conclusiones e incluyen tanto el objeto de trabajo como lo extraído de la experiencia. (2)	
Total				

Tabla 2
Encuesta de opinión para el alumnado

Items	Nada	Poco	Bastante	Mucho
1. El PTM me ha permitido integrar distintos saberes (Biología Vegetal, Química Orgánica y HCP)				
2. El PTM me ha posibilitado trabajar competencias profesionales como el trabajo equipo, comunicación y liderazgo				
3. El PTM me ha permitido conocer y manejar distintas herramientas y metodologías para:				
A) Buscar diferentes fuentes de información				
B) Comprender y sintetizar la información recopilada				
C) Organizar y redactar un texto científico				
D) Hacer una presentación y defensa oral del PT				
4. He comprendido el alcance del PTM desde su presentación al comienzo de las clases				
5. El nivel de exigencia académico del PTM se adecúa al contenido de las materias implicadas				
6. El seguimiento del PTM (tutorías, espacio de clases) por parte del profesorado ha sido adecuado				
7. Identifico el trabajo en equipo como una buena herramienta para mi aprendizaje				
8. Los métodos de evaluación del PTM (del trabajo escrito, presentación y defensa) son adecuados				
9. El porcentaje de nota del PTM respecto de cada asignatura es adecuado				
10. Observaciones generales:				
Nombra al menos tres puntos fuertes del PTM				
Nombra al menos tres áreas de mejora del PTM				

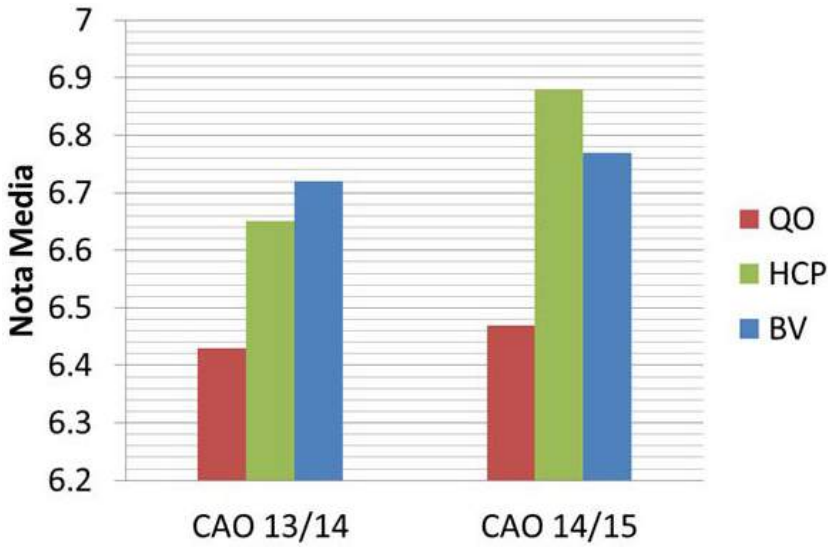
3. Resultados y conclusiones

Durante los tres cursos de aplicación del PTM, todos los equipos presentaron su memoria en tiempo, forma y con calidad suficiente. Las exposiciones y defensas orales alcanzaron los objetivos propuestos. En el curso 2014-15, sin embargo, dos alumnos (de un total de 28) fueron expulsados de sus equipos (ausencias injustificadas), y por tanto, no terminaron el proyecto.

La media global de calificación del PTM osciló entre 6 y 7, resultado que supuso una mejora respecto de los obtenidos en cursos anteriores (*Fig. 1*).

Figura 1

Notas medias obtenidas en el PTM en las asignaturas implicadas QO: Química Orgánica; HCP: Habilidades y Competencias para el Liderazgo; BV: Biología Vegetal

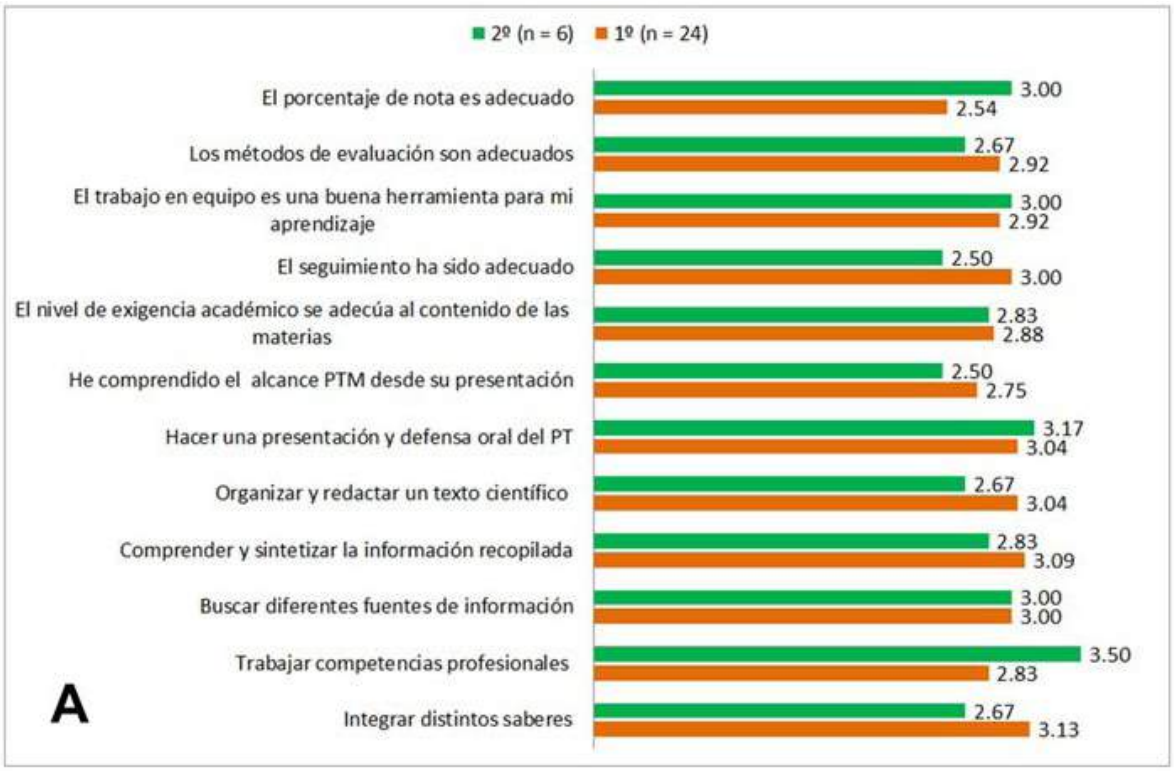


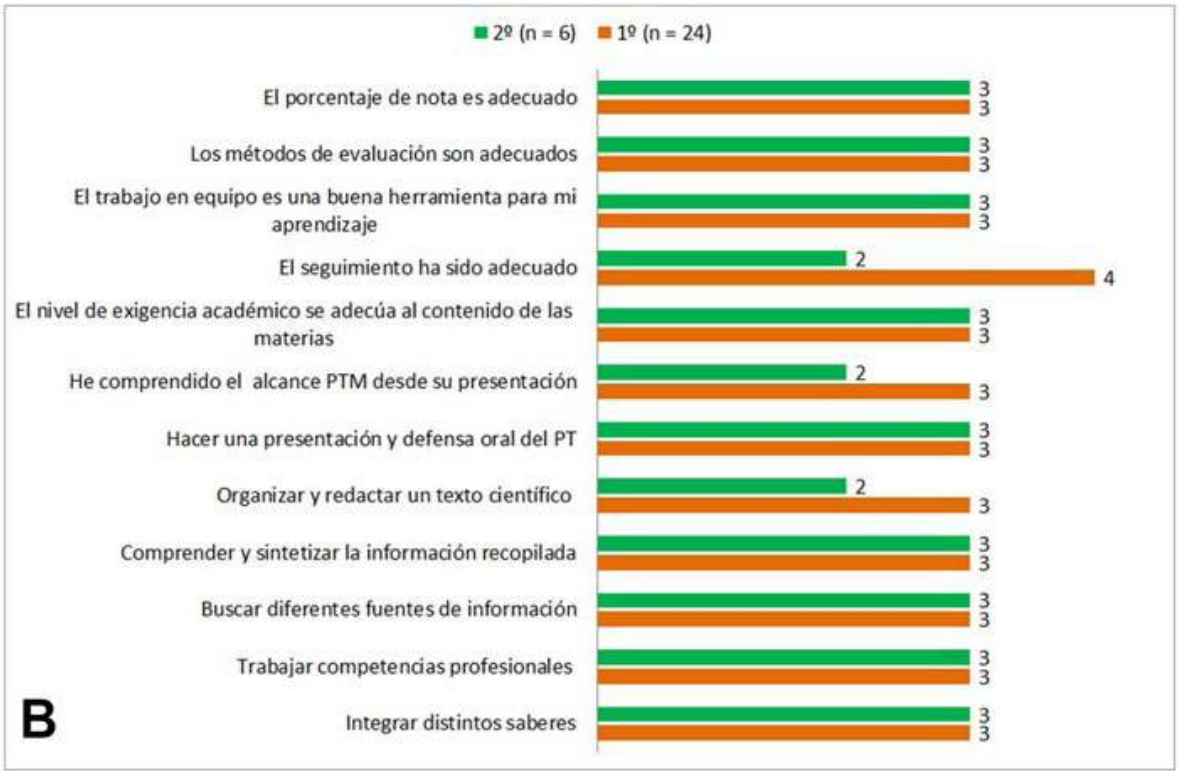
Los resultados de las encuestas de valoración del PTM indicaron de forma genérica que el proyecto había logrado alcanzar los objetivos propuestos (*Fig. 2*). Los alumnos valoraron el trabajo en todas las competencias e identificaron el trabajo en equipo como una competencia necesaria para su formación profesional. También resultó positiva su valoración del conocimiento y manejo de las distintas metodologías y herramientas para la realización de un trabajo científico, principalmente su exposición y defensa oral.

Por todo lo anterior, se concluye que trabajos multidisciplinares como el PTM, son experiencias de aprendizaje innovadoras y motivadoras que permiten que el alumno trabaje y desarrolle competencias específicas y genéricas, valore la necesidad e importancia del trabajo en equipo y consiga interrelacionar los conceptos de las diferentes materias implicadas.

Figura 2

Resultados de las encuestas de percepción realizadas por los alumnos del Grado de Farmacia: A) Medias y B) Medianas. La escala de medida es de 1 (Nada) a 4 (Mucho)





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Germinating popcorn and making spores dance – how to make undergraduates' first meeting with plants a success

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Abstract

Undergraduates' first exposure to plant biology is important for whether the students choose to study plants further or not. How the students are engaged in their learning are extremely important for their motivation. Research has shown that making drawings during studying biology develops students' observational skills as the learner is engaged in the close and detailed study of the focal organism. Maybe it is not only the drawing itself, but also the close observation that engage the students? Previous published research suggest that an instructional approach which can in a short term be phrased "*active learning*" is more effective and also creates a deeper learning than what the students achieve through traditional lecturing. Here we present different exercises and the experience we have from a undergraduate lab course in plant systematics with about 90 students each year. The experiments include germination of seeds, traditional drawing and labeling, plant dissection, tasting berries and nuts, multiple choice quizzes, and species determination using an app. We present data on students and teachers' evaluation of the learning outcome from the different exercises over two years, in addition to the students' evaluation of which exercises that increased their motivation for learning about plant biology. In their general feedback students report that the lab course is what they like best as it is inspiring to observe the plants and the structures in real life, not only in the text book. Judging from the answers directly linked to the lab-course evaluation, making the drawings and hands-on activities was what they enjoyed and learned the most from.

1. Introduction

Species identification knowledge is important in the biology education, and can be seen as a general competence for a biologist. The world we live in is experiencing climate change, and we will therefore see a loss of species and biodiversity. Having the species identification skills, is important if we want biologists to be able to make informed and correct decisions when it comes to conservation. Biology students at the university level should learn about biodiversity and identifying species (Buck *et al.*, 2019). The best way to learn this is through laboratory work especially with the students own observations and involvement in their learning through varied tasks and activities. In addition to learning the specific plant parts and their names, plants are an ideal group of species to use for teaching and learning observational and descriptive skills, as they are sessile and available in most environments (Stagg and Verde 2019).

2. Aim of this Study

In this paper, we have focus on activities for students in their first year of university and activities that will enhance their learning and their interest in plants and plant ecology, and to provide them with a good background for their future courses in biology. Plant

identifications is a central competence and a basic skill that is important to teach new students (Uno 2009, Buck *et al.*, 2019). Within our task to educate future biologists we need to have focus on the organism/species level to provide them with direct species knowledge as well as good understanding of higher level of categorisation (*e.g.* Jacquemart *et al.*, 2016). Using different activities can be an important tool for keeping the students motivated for learning and engaging in their learning process, especially when there are many (new) botanical terms and small morphological details presented at all times.

As the learning objectives of the basic courses can be very challenging, confusing, and seeming useless we propose a variety of tasks and activities that can be used to make undergraduates' first meeting with plants a success based on the feedback from the students.

3. Experimental Design

Over two years (2018 and 2019) we have used the feedback from the students enrolled in the course Organismal Biology I at the University of Bergen with focus on the botany teaching activities. Each year there was 100-120 students that had signed up for the course.

The botany part, which covers approximately a third of the content in a 10 ECTS course, start with five non-compulsory lectures (2x45 min). These lectures cover the basic themes of plant systematics and plant groups, focusing particularly on plant groups challenges with life on land, and their life cycle and morphological solutions to a more diverse and a more adapted life on land where water is the limiting factor. The lectures cover i) mosses, ii) seedless vascular plants, iii) gymnosperms, iv) angiosperms, and v) pollination and spreading of seeds. The lectures are a combination of instructor presentations (A.E.Bjune, AEB), questions and discussion amongst the students, and the use of online clicker questions followed by a class discussion. Following the five lectures, all students have to take part in the laboratory course with four compulsory sessions - mosses, seedless vascular plants, gymnosperms, and angiosperms. The laboratory course was led by SVH (2018) and RG (2019). Before the practical work started, students were given the possibility to prepare for the lab session by taking an online quiz. The main focus of the laboratory course is the ability to document what is observed for each species or plant group. After each laboratory session a written report has to be handed in. If the report is found to be of low quality, the student has one chance to improve it. To take the final exam all four reports have to be accepted.

The laboratory activities included activities such as drawing plants and plant parts seen by the naked eye, in the stereo microscope or in a microscope, labelling pre-made drawings and filling in tables in their lab report, tasting and seeing the different fruit structures and functions (Fig.1), and lastly germinating seeds (popcorn, pea flowers, sunflowers, pumpkins, and chives) to watch differences between monocots and dicots (Fig. 2).

When the laboratory course was done, we distributed a questionnaire about the activities we had included that should be answered anonymously. The activities were;

a) Making drawings and set names.
b) Fill in tables.
c) Add names to figures.
d) Answer questions in the lab report.
e) Online quiz before lab.
f) Seed experiment.

Answers were given by ticking off boxes with the four possible answers I learned a lot/I learned a bit/I learned nothing/I did not do this. Students also had the possibility to report suggestions for improvement or changes to the course.

4. Results

In 2018, 64 students responded to our questionnaire. For 2019, the responses from students are still being collected. The finding from 2019 will be presented on the poster at EuroSoTL in Bilbao.

The student's responses are summarised in figure 3 for activities a – f mentioned above and the answers in the categories given to the students as possible answers.

Figure 1

A. different fruits ready to be tasted, B. plants on display before the course starts, C. students working with observations of plant morphology

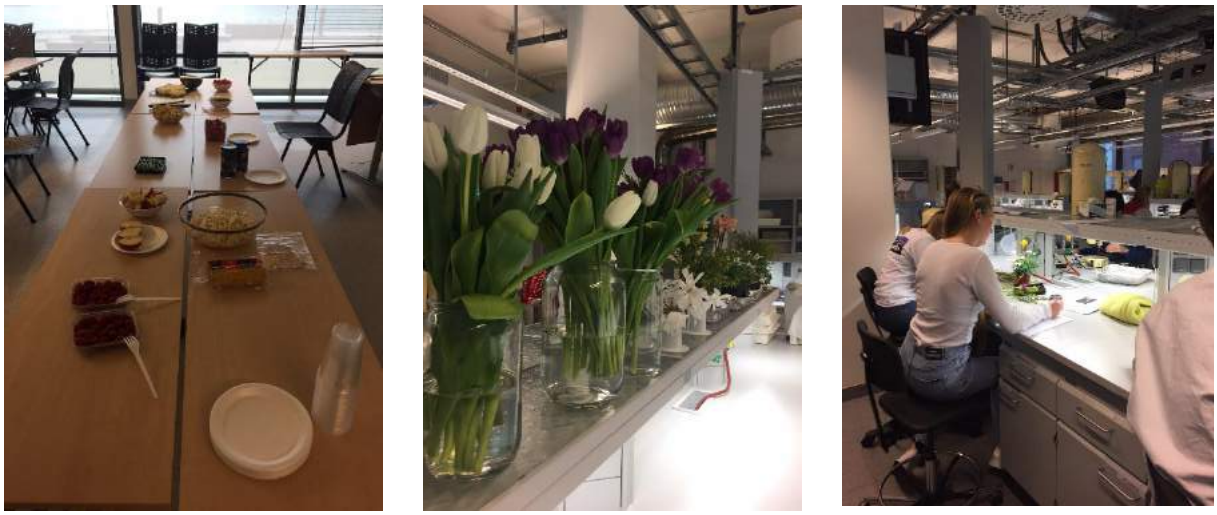
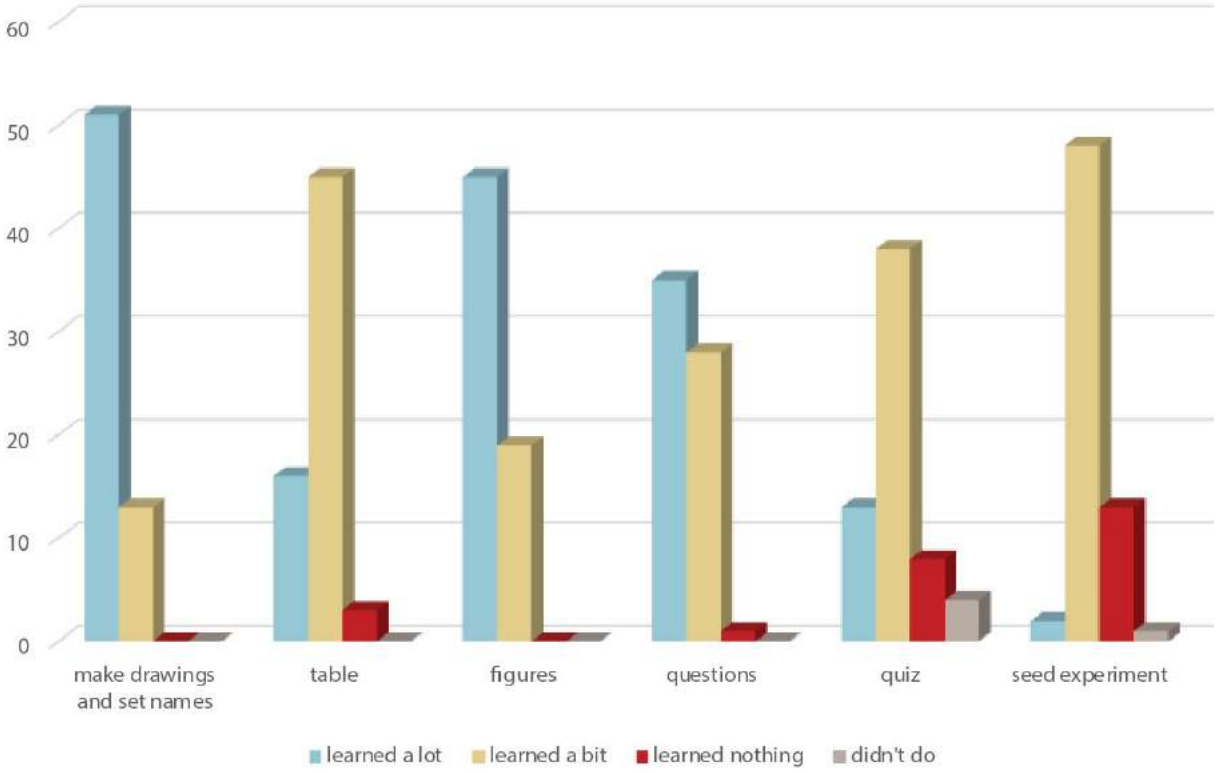


Figure 2

A. Seeds to be grown by students as part of their laboratory course – popcorn, sunflowers, pumpkins, pea flowers, and chives. B. Popcorn germinating with one cotyledon

Figure 3

Main results of the questionnaire to the students based on the response in 2018. The labels under the columns refer to the activities a – f mentioned above



5. Conclusion

In general we got very good feedback from the students. Even if many students complain about observing plants and making drawings of plant morphology and plant characters during the lab sessions, most students report that this is what they learn most from, in addition to adding names (labels) to figures and answering questions in the lab report (fig 3). We think it is important to stick to this old, traditional method, but also keep the variation with different tasks for the students. An important issue is the give the students enough time to complete all the tasks for each laboratory class.

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The power of books. An approach to the Sustainable Development Goals through a common reading experience

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Abstract

With education as an essential tool to achieve the Sustainable Development Goals (SDGs), this work intends to approach the 17 SDGs to second-year students of the subject "Natural Sciences for Teachers" (Degree in Preschool and Primary School Education; Faculty of Teacher Training, University of Valencia, Spain) through the reading of the book "Encara no és tard, claus per a entendre i aturar el canvi climatic" [It is still not late, keys to understanding and preventing climate change] written by Andreu Escrivà.

To ensure that students are effectively involved in achieving the SDGs, a methodology focused on three learning dimensions was followed. On one hand, student-centred learning was promoted as the comprehensive reading of the book encourages students auto-reflection prompting their evolution autonomously. On the other, action learning was carried out since students had to develop the book contents to tangible teaching proposals on the SDGs for preschool and primary school. The third dimension was a transformational learning approach through students questioning: a dialogue-conference with the writer promoted academic debate and permitted an evolution of their understanding and perception of the world where we live and the big challenges we are facing nowadays. A questionnaire was completed by pre-service students before and after the teaching sequence was carried out.

With all, it is intended that students acquire knowledge, skills, values and attitudes related to climate change and sustainable development. This work presents preliminary results of the whole teaching sequence.

1. Introduction

The idea of unsustainability of current development and the need to demand global approaches requires taking into consideration the totality of interconnected problems that humanity has to face. In that sense, sustainability aims to mobilize collective responsibility to address the related and mutually reinforced socio-environmental problems and the situation of planetary emergency that poses a huge and urgent challenge to humanity [1,2].

Education necessarily plays an essential role in promoting a citizenship capable of facing this situation of planetary crisis [3,4,5]. In the framework of promotion of Education for a Sustainable Development (ESD), UNESCO proclaimed in 2005 the Decade of Education for Sustainable Development that led hundreds of educators worldwide towards a central objective: learn to live and work in a sustainable way [6,7]. Currently, the Global Action Program for ESD is responsible for reorienting and strengthening education and learning to accelerate progress towards this sustainable development. And in that sense, the

17 Sustainable Development Goals (SDGs) approved at the 2015 Summit of the United Nations recognize the importance of education to achieve its goals in 2030 [8].

Although students are exposed to environmental issues in many sciences classes and in the media, different studies suggest that they still hold many environmental misconceptions, and global warming and climate change are not an exception [9,10,11].

Our proposal focuses on the introduction of SDGs and climate change issues through the use of an informative essay. This genre, frequently used in literature subjects, is rarely used in sciences courses despite promoting both autonomous and cooperative learning. Other benefits are its approach to intellectual tasks from a mature and personal point of view with the clear vocation to develop motivation and encourage the participation of students.

2. Methods

For this research, we used a group of 47 students (41 females), of an average age of 19, on their second-year compulsory subject of "Natural Sciences for Teachers" of the Degree in Preschool and Primary School Education (Faculty of Teacher Training, University of Valencia, Spain). The methodology of this research covers three learning dimensions: student-centred learning, transformational learning and an action learning approach.

2.1. Pre- and post- questionnaire

Preconceptions around climate change, sustainability and sustainable development goals were approached through an initial broad questionnaire administered during the first week of the second semester of the academic year 2018/2019 (*Table 1*).

Table 1

Questionnaire to obtain students' preconceptions on climate change, sustainability and SDGs. The questions analysed in this paper shaded in grey

Q1. What do you understand by «Greenhouse Effect»?
Q 2. What greenhouse gases do you know?
Q 3. What role do greenhouse gases play in the atmosphere?
Q 4. Do you think that there is a relationship between the hole in the ozone layer and the climate change? (Yes, direct and causal; Yes, but I do not know it; No, they are independent; I do not know).
Q 5. What do you understand by climate change?
Q 6. What consequences do you think that climate change has and will have on us?
Q 7. What measures can you adopt as a citizen to curb climate change?
Q 8. Do you know what measures are being taken at the most global level: from governments, international organizations… to curb climate change?
Q 9. Have you heard about the Sustainable Development Goals (SDGs)? If so, describe briefly what they are and what you know about them.
Q 10. What do you understand by Sustainability?

2.2. Book reading and dialogue-conference with the writer

In order to introduce concepts related to climate change, a student self-learning strategy was followed through the promotion of the comprehensive common reading of the book "Encara no és tard, claus per a entendre i aturar el canvi climatic" written by Andreu Escrivà [12]. The book effectively explains the concept of climate change and global warming, without using a complex vocabulary and is full of close-to-audience examples. These qualities were recognized and awarded with the European award of Scientific Popularization (2016). Furthermore, the book is originally written in Catalan, an official language of the Autonomous Community, which helps improving student's reading competence on this language.

After the reading of the book, students produced a review comprising a summary of the main ideas of the book —using the vocabulary acquired in the reading—; their personal and reflective opinion about the book; and their recommendation in a Likert scale, being 1: Totally unessential reading. I do not recommend it at all; 2: Unessential reading; 3: Acceptable reading; 4: Recommended reading; 5: Highly recommended (essential) reading. Finally, students had to suggest three questions arisen from the book reading that would be posed during the dialogue-conference with the author.

The transformational learning approach was attempted through the dialogue-conference with the writer, once all the students had read the book and elaborated the review. The class was distributed forming a semicircle, distribution that facilitates communication in the academic debate. During 90 minutes, students posed their questions to the author, intercalated with author explanations on how to bring climate change issues to the classroom.

2.3. Teaching proposals on the SDGs

The concept of sustainability and SDGs was introduced with the game pack "Go Goals" [13]. This game includes a board game sheet and questions related with the 17 SDGs. After a short explanation of games rules and theoretical concepts (sustainability and SDGs) students played "Go Goals" for 45 minutes. Then, the 17 goals were randomly distributed so each goal was approached by groups of 2-3 students. Action learning was carried out since the students had to transfer the book contents to tangible teaching proposals related with the SDG, adjusting the complexity of the explanation for kindergarten or primary school students.

Students had to perform a 6 minutes PechaKucha presentation relating information from the book with the SDGs followed by a 4 minutes into action proposal with the rest of class.

2.4. Learning perception

After the teaching sequence, the initial questionnaire was administered, including some new questions focusing on students' learning perception from the different activities (book reading, book review, dialogue-conference, game pack, SDGs explanation and teaching proposal). Students were asked about their learning perception using a Likert scale being 1: I have not learned anything, 2: I learned a little, 3: I learned a lot, and 4: I learned quite lot.

3. Results

3.1. Pre- and post- questionnaire

Due to the limited space offered for describing the research, we only focus on some of the answers given by the students (questions shaded in *Table 1*) that allow us to get an idea of the success of the didactic sequence.

Regarding greenhouse effect (Q1), described as the physical process by which the Earth is warmer than it would be if certain gases (greenhouse gases) were not present in the atmosphere [12], very few answers of the pre-questionnaire explained it correctly. Several definitions referred to holes in the ozone layer that allowed more heat rays or ultra-violet rays to enter the atmosphere, warming up the planet. Some bizarre answers explained the effect as a result of solar rays trapped in the atmosphere and creating an ozone layer. Others joined the greenhouse effect with the stratospheric ozone. This question was satisfactorily answered in the post-test, giving Escrivà's definition [12]. However, some answers, e.g. "The effect that occurs when solar rays break the ozone layer and begin to slowly warm the ground as they do not stop entering", indicate that we cannot stop dealing with these issues during teacher training.

When asked about greenhouse gases (Q2), less than half of students (16 out of 41) mentioned carbon dioxide. Ozone was considered by three students and methane and nitrogenous (without specifying the compound) only by one. Eleven students cited oxygen as greenhouse gas, either alone or with carbon dioxide. Six students were unable to give an answer. No one mentioned chlorofluorocarbons or water vapor. After the whole teaching sequence, answers changed strikingly. All students considered carbon dioxide as a greenhouse gas. This gas was accompanied by methane in 25 cases. Other answers referred to different combinations, where ozone, sulphur dioxide, nitrous oxide, water vapor and chlorofluorocarbons appeared. Oxygen was cited only by three students.

Although we owe our existence to the presence of these gases, as they maintain the temperature of Earth at an average of 15°C, when asked for their role (Q3), only two students considered this aspect. Others mentioned that they were good for plant growth or for respiration (the erroneous consideration of oxygen as a greenhouse gas). The rest of the students attributed a negative role to these gases; in some cases, considering as a direct cause of ozone layer depletion ("they cause more ozone holes"). No student mentioned that their role depends on the gas ability to retain heat (the global warming potential of a gas), the concentration in which each gas is present in the atmosphere, and the anthropogenic cause of gas variation. After the teaching sequence, almost all students linked greenhouse gases with a rise in temperatures. Only two of them cited the ozone layer depletion, but after considering carbon dioxide and methane as greenhouse gases. One student kept on the idea of their importance for our breathing.

Regarding SDGs (Q9), only seven students had heard about SDGs and two offered a rough definition, without giving examples. This answer changed completely after the intervention: all students gave an approximate definition and explained several SDGs.

3.2. Book reading and dialogue-conference with the writer

In their book reviews, students highlighted the concepts of climate change, global warming and greenhouse effect, together with their causes and consequences. The

vocabulary was used correctly and in the right context. Regarding the overall assessment of the book, most students stressed that it is a recommended book (4) and very necessary, although they stated that in some cases they would have liked to have greater scientific knowledge. They also stressed that they were unaware of most of the information provided in the book.

Questions proposed by the students and posed during the dialogue-conference allowed a dynamic session with a fluent interchange of opinions (*Fig. 1* and *Fig. 2*).

Figure 1
The writer, Andreu Escrivà, explaining how our decisions contribute to climate change

Figure 2
All students were distributed in a semicircle. In the image, half of the class

3.3. Teaching proposals on the SDGs

The game "Go Goals" allowed the students obtain a first contact with the SDGs in a dynamic way. Once they finished, they were able to mention all of them and explain what they were talking about (*Fig. 3* and *Fig. 4*).

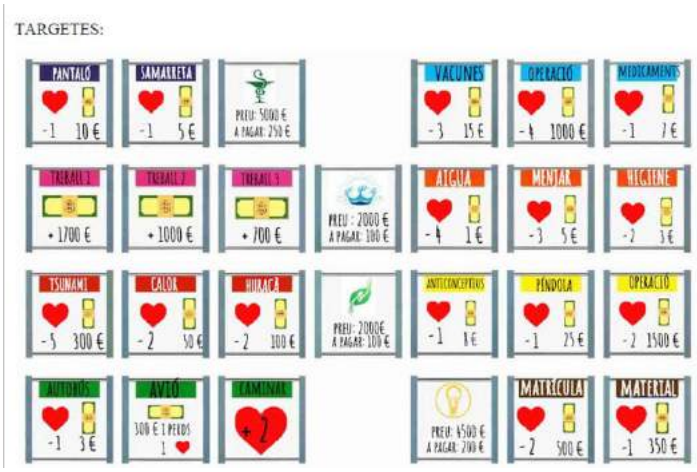
Figure 3
Distribution of students in groups of 4 to 6 students to play the game

Figure 4
A student group showing the board and the cards used during the game

Furthermore, students were able to incorporate the information of the book into their SDGs' explanations and proposals. The proposals were quite diverse. A group of students chose the storytelling format in which students had to rewrite the story without stereotypes, discriminations or gender inequalities for SDG 5. Other preferred more manipulative activities as the monopoly-style board game to explain SDG 2 and 3 (*Fig. 5*).

Figure 5

Monopoly-style board game proposed for Good Health and Well-being (SDG 3)



3.4. Learning perception

Student learning perception with all activities developed was high. Best considered learning activities were the book reading and the teaching proposal related with the SDG with an average of 3.36 ± 0.13 and 3.35± 0.10 (±SE, n = 37), respectively. Students felt that they had learnt a lot with the book review, the dialogue-conference, the game pack and the SDGs explanation by different teams (an average of 3 in all three activities).

4. Conclusion

While we are still in the early stages of our analysis, our preliminary results suggest that SDGs can be successfully taught through different strategies and the reading of a book, even if not directly related with all the goals, can be a useful tool. Compelling the students to read an informative book devoted to climate change we obtain several benefits. On the one hand, we contribute to the learning of this topic of growing interest and of necessary knowledge. On the other hand, as seen in the preliminary surveys, despite the enormous diffusion of the topic in the media, numerous errors of concept persist, preventing a correct understanding at a global level. In many cases climate change is perceived as a problem that does not affect ordinary citizens. Furthermore, by making students extract those contents of the book related to the SDGs they address, they are aware of the transverse nature of the problem of climate change and its direct relationship with the SDGs. Climate change leads to the destruction of diversity that, as a recent study indicates [14], shakes a good part of the SDGs set by the United Nations. Therefore, through reading a book of this nature we encourage inclusion

of SDGs in students agenda and make them aware of the big challenges we are facing nowadays.

Acknowledgments

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Una propuesta de integración de software de cálculo simbólico para el aprendizaje de cálculo en Ingeniería

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Resumen

El presente trabajo presenta la experiencia en la integración del software de cálculo dentro de la asignatura de Cálculo para un aprendizaje más significativo y profundo dentro de los estudios de ingeniería. Esta propuesta pretende, a través de la utilización de herramientas digitales de uso en la docencia y en el campo profesional, aportar al estudiante una metodología de enseñanza-aprendizaje que le permita realizar visualizaciones que le conduzcan desde los aspectos teóricos a la resolución de problemas relacionados con la ingeniería. Aprovechando todo el potencial de los programas de cálculo para resolver problemas y hacer simulaciones que permiten analizar diferentes soluciones a tiempo real. Por lo que es un complemento óptimo para la comprensión de los conceptos tratados. Se plantean nuevas metodologías innovadoras capaces de adaptarse a las demandas de la sociedad. Además, se persigue que el alumno evalúe de forma crítica los resultados que se obtienen de este tipo de programas.

Abstract

This work shows the experience of the integration of the calculation software within the calculus course for a more meaningful and in-depth learning within the engineering studies. This design expects to provide the students with a learning methodology based in the use of digital tools making possible the development of visualizations that will lead them from the theoretical aspects to the resolution of problems related to engineering. Taking advantage of the full potential of the calculation programs to solve problems and run simulations that enables us analyse different solutions in real-time. Consequently it is the perfect complement for the understanding of the concepts covered in the course. We present new innovative methodologies able to adapt to the demands of the society. In addition, another aim is to let the students review in a critical way the results obtained in these type of programs.

1. Introducción

Dentro de la docencia universitaria los currículos de enseñanzas técnicas y científicas incluyen diversas asignaturas relacionadas con las matemáticas (álgebra, geometría analítica, calculo diferencial, etc.) cuyos conceptos y demostraciones implican ideas abstractas y a menudo difíciles de entender para los estudiantes. A pesar de su dificultad, estas materias son necesarias para desarrollar correctamente el pensamiento analítico, el rigor demostrativo, la objetividad numérica y el desarrollo del razonamiento, entre otros, es decir, estas materias inculcan en los alumnos el pensamiento crítico proporcionándoles una compresión profunda de los conceptos con los que trabajan. En el caso particular de la enseñanza en los grados de ingeniería, las matemáticas inciden de manera significativa en el análisis y diseño de procesos y productos. Los estudiantes de ingeniería deben tener la capacidad de reunir e interpretar datos relevantes para alcanzar soluciones óptimas a los problemas planteados. Para ello han de ser capaces de identificar la información necesaria para plantear soluciones adecuadas a los problemas y utilizar los medios adecuados para obtenerlas de forma justificada. Una de estas materias básicas a estudiar en los diferentes grados de ingeniería es el cálculo diferencia e integral, puesto que es una herramienta usual en áreas muy técnicas de la ingeniería.

En el marco legislativo vigente de los planes de estudio universitarios (grados), el Ministerio de Ciencia e Innovación (CIN/351/2009) hace referencia a que los estudiantes universitarios desarrollen las competencias tecnológicas y digitales. La competencia digital está definida por la Comisión Europea (2007) como "el uso seguro y crítico de las tecnologías de la sociedad de la información para el trabajo, el ocio y la información"[1]. Ante esta demanda los profesores universitarios han recurrido a distintas herramientas digitales para el estudio de distintas materias dentro de las matemáticas [2, 3].

2. Herramientas de cálculo

Una de las herramientas digitales más utilizadas actualmente para el cálculo diferencial e integral en múltiples ámbitos profesionales es la utilización de programas de software de cálculo simbólico que permiten la resolución y representación gráfica de funciones de forma rápida y sencilla [4]. Es por esto que la enseñanza de este tipo de programas dentro de la asignatura de Cálculo cumple dos funciones básicas, la primera es la facilitación al alumno la visualización y compresión de conceptos abstractos dentro del cálculo diferencial e integral y la segunda es el aprendizaje de herramientas digitales que tendrán que utilizar en su vida profesional. Sin embargo, en muchas ocasiones esto se ha reducido a unas prácticas de ordenador aisladas del resto de la asignatura que el alumno ejecuta de forma mecánica. Esto genera que el alumnado perciba estas prácticas por ordenador como un mero trámite a ejecutar, sin que lo relacione con el contenido teórico de la asignatura ni le aporte en su proceso de aprendizaje.

Por consiguiente, la propuesta de este trabajo es implementar el uso de este tipo de programas no sólo como prácticas de ordenador en las que el alumno debe aprender a manejar los programas sino también dentro de la docencia magistral, lo que permitirá que al docente demostrar en tiempo real la utilidad y rapidez de este tipo de programas, así como relacionar de una manera precisa las prácticas de ordenador con los distintos temas estudiados en las clases magistrales.

Durante la docencia magistral se utiliza la pizarra o una presentación en el popular formato powerpoint. La primera otorga al docente una total versatilidad, pero en el caso de representar gráficamente funciones depende de la pericia del docente dibujando. Por otro lado, la segunda es rígida. La utilización del programa Mathematica [5, 6] dentro de la clase magistral permite la versatilidad de una y la precisión de la otra.

3. Método de aplicación

Un ejemplo es la resolución de un oscilador harmónico amortiguado. Un caso típico en el estudio de las ecuaciones diferenciales por su gran aplicación en física [7]. Se trataría del caso de una masa suspendida de un muelle y que se deja oscilar en torno a su posición de equilibrio con cierto rozamiento. Con lo que se desea calcular la amplitud de la oscilación en función del tiempo. Al plantear las ecuaciones de la dinámica se llega a una ecuación lineal homogénea de coeficientes constantes del tipo. Donde un parámetro de la ecuación está relacionado con la amortiguación que sufre el oscilador y otro con la rigidez del muelle. La resolución de esta ecuación lleva a dos tipos de soluciones. Para un valor del "Parámetro de amortiguación" suficientemente pequeño se obtiene una función de la forma sinusoidal con una amplitud que decrece exponencialmente. Para valores suficientemente grandes del "Parámetro de amortiguación" no se llega a dar ni una sola oscilación (conocido como so-

breamortiguamiento). En una clase tradicional el docente o bien dibuja estas soluciones a mano en la pizarra o bien las muestra en una presentación previa. La utilización de software de cálculo permite tanto resolver la ecuación diferencial como realizar gráficas en las cuales los parámetros asociados a la solución pueden cambiarse de forma dinámica. En este sentido es especialmente interesante el comando "Manipulate" del software Mathematica. Mediante el mismo se puede realizar una gráfica e ir cambiando el valor de dos parámetros mediante dos cursores.

La figura 1 muestra la gráfica correspondiente a un oscilador armónico amortiguado para cuatro situaciones diferentes. En la parte superior izquierda el "Parámetro de amortiguación" se ha incrementado lo suficiente para llegar al régimen de sobreamortiguación. De esta forma no hay oscilación y la masa se acerca hacia su posición de equilibrio sin llegar a oscilar. Deslizando el cursor superior se cambia de forma dinámica el valor de este parámetro. Con lo que se puede pasar de forma continua de un régimen a otro. En la parte superior derecha de la figura 1 se muestra la misma curva, pero para un valor del "Parámetro de amortiguación" lo suficientemente pequeño como para que sí haya oscilaciones. Como guía para los ojos se incluye la curva exponencial de la amplitud máxima (línea punteada).

En la parte inferior de la figura 1 se muestra el efecto sobre las oscilaciones de aumentar el valor del "Parámetro de elasticidad". Según este aumenta el periodo se reduce y la frecuencia aumenta.

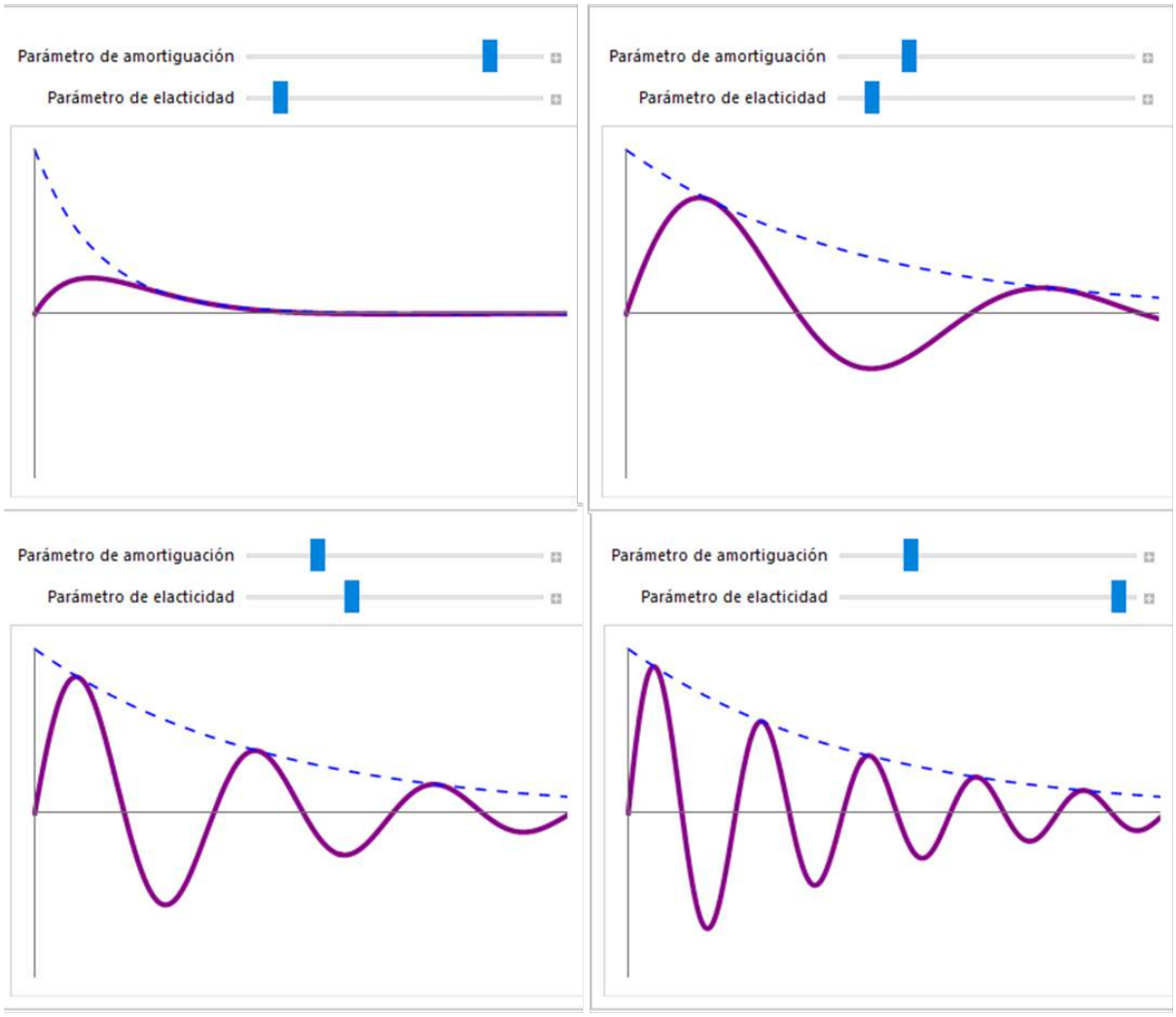
Es especialmente interesante resaltar que el cambio del valor de cada parámetro se realiza simplemente deslizando un cursor. Con lo que resulta especialmente simple y visual para el alumnado. En particular, cuando el docente realiza esta clase de representaciones en la pizarra en muchas ocasiones el alumnado muestra dificultades para seguir el razonamiento. Con esta herramienta la explicación resulta más visual, en particular resulta obvio que es el mismo sistema con un parámetro cambiado. Es más, resulta fácil para el docente explicar el efecto del cambio de cada uno de ambos parámetros en el comportamiento de la curva. En particular el cambio de régimen al modificar el "Parámetro de amortiguación" resulta especialmente visual, así como el efecto del cambio del "Parámetro de amortiguación" sobre la frecuencia de oscilación.

4. Conclusiones

En este trabajo se realiza una propuesta de integración de software de cálculo simbólico en las clases de ingeniería para favorecer el aprendizaje de cálculo. Se plantean las problemáticas asociadas a las clases tradicionales y se plantea qué puede aportar el software de cálculo simbólico a esta problemática. Se ha mostrado un ejemplo para el casó clásico de un oscilador armónico amortiguado. En este queda de manifiesto la versatilidad de esta herramienta. Con un simple gesto se pueden cambiar de forma continua el valor de los parámetros dejando de manifiesto el efecto de estos cambios sobre el comportamiento del sistema. De esta manera el aprendizaje es más significativo y profundo, además de conseguir relacionar los conceptos utilizados en las clases magistrales con las prácticas de ordenador en las que los alumnos aprender a utilizar este tipo de programas.

Figura 1

Grafica de la amplitud de un oscilador armónico amortiguado en función del tiempo para varios valores de los parámetros



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Biochemistry, where you can find new interactions

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Abstract

In subjects known as basic, as is the case of the of Biochemistry, in the first years of degrees related to Health Sciences, there is usually a climate in the classroom with little motivation and involvement from the students, since they have the perception that the subject is difficult and boring. From this problem arises this project, whose objective is to increase the engagement of the students of Biochemistry as a key to address the problems of low performance and low motivation. For this, we have relied on the methodology of peer instruction developed by Eric Mazur, including several modifications, but keeping the basis of this interactive educational method in which students explain the concepts to the rest of the classmates and the use of conceptual tests before and after the explanations. To promote motivation and creativity, and thereby increase the involvement of students, we ask them to use *new* educational tools, by preparing videos, to make the explanations to their classmates. The project has been developed in the subject of Biochemistry in the Degree of Veterinary Medicine, in the Universidad CEU Cardenal Herrera, in the second year. They performed conceptual tests before and after the peer instruction, improving in most cases the results of these tests after the experience. Finally, the students conducted a survey, based on the SEEQ questionnaire, a reliable and validated tool to assess the degree of satisfaction of university students. The general evaluation was good, being the teacher-student and student-student interaction the better factors evaluated, while the perception of learning was not as good as expected.

1. Introduction

In the traditional lectures at the university, one of the main problems is that the student must pay attention to monologues. This decrease the student's learning, promoting disinterest in the topics, obtaining as a result that the student only memorizes the concepts, without having an effective understanding of them. This problem is even bigger in subjects known as basic, as is the case of Biochemistry, in degrees related to Health Sciences, where there is usually little motivation and involvement of the students. From this situation we proposed this project based on the Peer Instruction method and the used of new technologies like short videos to increases the learning and engagement of our students (Kuh, 2003).

2. Material and Methods

The project is based on the Peer Instruction methodology developed by Professor Eric Mazur (Mazur, 1997). In this method students focus on understanding concepts that present difficulty of understanding. It is a classroom method in which students are involved in their own learning (Turpen & Finkelstein, 2010). Subsequently, the students discuss and explain their way of thinking in relation to a specific topic. Finally, the same conceptual test is redone to assess the level of understanding. This test has a more structured questioning format. We have included some modifications on Mazur's methodology but keeping the basis of this interactive educational method and the used of pre and post conceptual tests. To promote motivation and creativity and, therefore, increase student engagement, we proposed them

to use new educational tools, such as short videos to give explanations to their classmates (Francis, 2017).

The project has been developed in the subject of Biochemistry, during the second year of the Veterinary Medicine Degree in the Universidad CEU Cardenal Herrera, in the Spanish and English courses. The total number of students were of 164, 126 from the Spanish group and 38 from the English. Eight different concepts related to the Oxidative Metabolism were selected.

For the Spanish course, a total of 32 groups participate, with 4 to 6 students per group. In the first seminar session, the activity was presented, and the online Pre-test was done in the classroom. In 2 weeks, they delivered the video script that was reviewed by the teachers. A week later the videos where uploaded to YouTube. Finally, in classroom they watched some videos and perform the Post-test. In the English course, the distribution of the seminars was the same, with 38 students participating and in total 11 videos.

Finally, the students conducted a survey, based on the SEEQ questionnaire (Marsh, 1982), a reliable and validated tool to assess the degree of satisfaction of university students

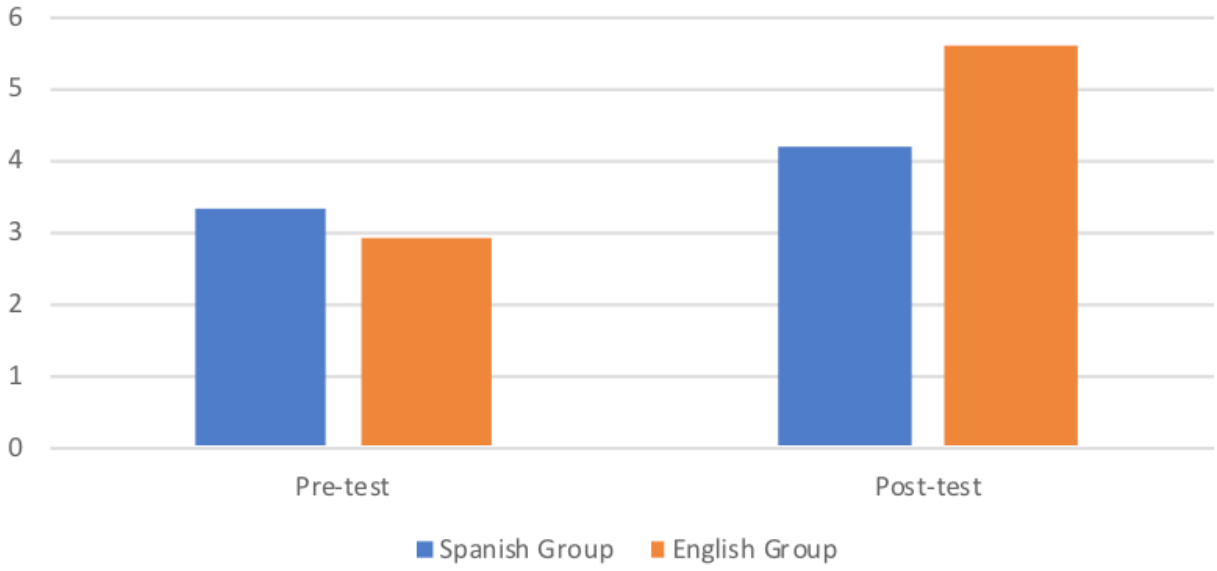
3. Results and Discussion

We analyze the data obtained in the pre and post-conceptual test. This test consists of 8 multiple choice questions, with a medium to high level of complexity.

Figure 1 shows an overall improvement in the two groups before and after the learning experience. The improvement of the English group is greater that the Spanish, although the pre-test results are lower.

Figure 1

Mean results of the pre and post conceptual test in the Spanish and English group



However, the analysis of variance performed in both groups indicates that, in neither of the two groups, the differences in means are significant (Table 1).

Table 1
Analysis of variance of the pre and post conceptual test

Spanish group			
Test	**Sample**	**Mean**	**Variance**
PRE-TEST	127	3,36220472	1,77252843
POST-TEST	127	4,2519685	2,3328334
F	*Probabilidad*		
24,4907297	*1,36698E-06*		

English Group			
Test	**Sample**	**Mean**	**Variance**
PRE-TEST	38	2,89473684	2,25889047
POST TEST	38	5,60526316	3,59672831
F	*Probabilidad*		
47,6780032	*1,4776E-09*		

To assess the degree of learning with this methodology the factors of learning value, group interaction, individual rapport and general assessment (Figure 2) from the SEEQ survey have been analyzed, together with some of the open questions.

The analysis of the data shows a global assessment of the good experience, although with remarks.

The best factor is teacher-student interaction (individual rapport), which is a relevant factor to achieve student's involvement in learning. They express this idea with sentences like *They seem very keen on our academic results and will always push us to do our best*, connecting with Astin's idea about the concept of implication expressed as the amount of energy students invest in their learning, giving the best of themselves (Astin, 1984).

The next factor is group interaction, closely related to the concept of peer instruction. Sentences like *working in a group and in an entertaining activity helps to better retain some concepts* are indicative of what they want to express. But they also have found difficulties working in groups, like for example expressing: *it took a lot of effort to organize and plan.*

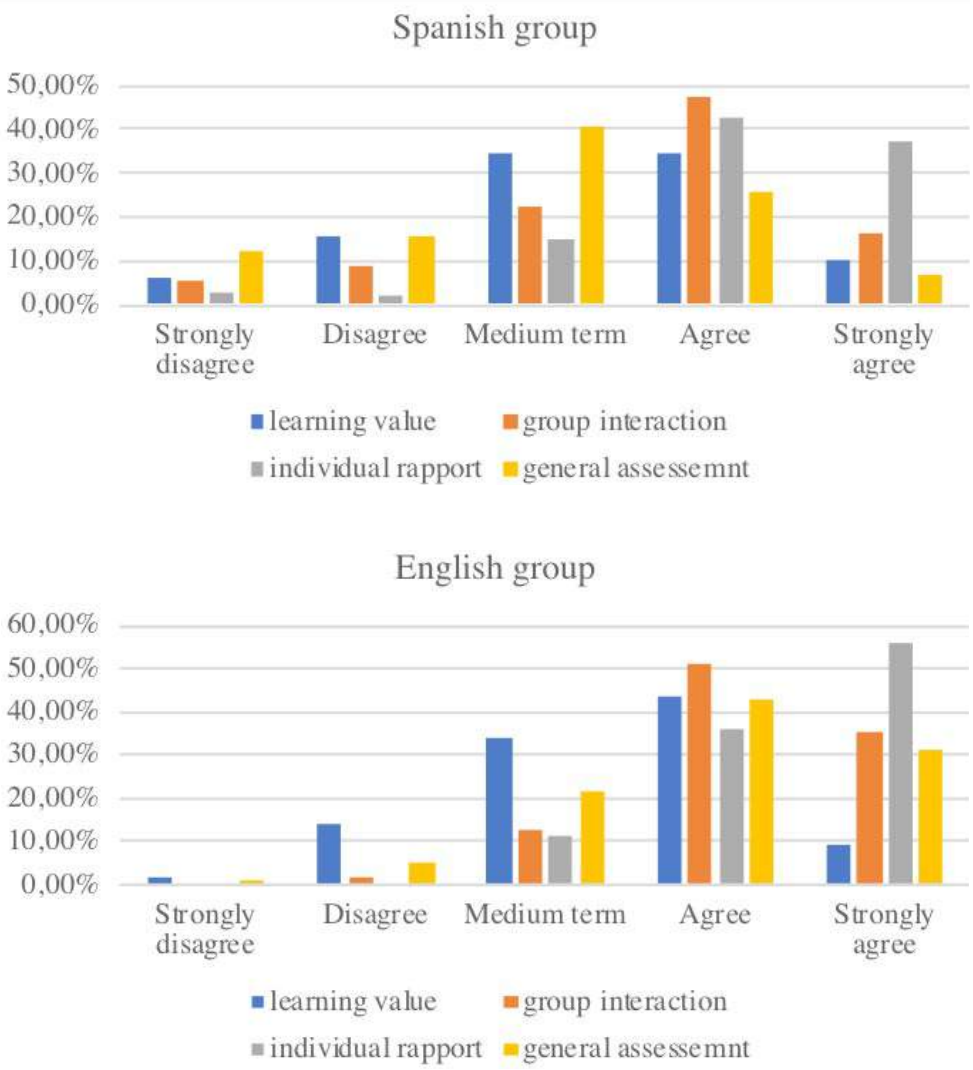
The most critical factor is the learning value or what is the same, the student's perception of learning and improvement in the comprehension of the concepts. The sentence, *the amount of work that this seminar is asking "is not worth it" compared to what we really learn,* summarize this feeling.

The students themselves offer us explanations of what had happened. They consider that the concepts are complex and that they have high difficulties to understand. However, they admit that working in this way has forced them to study and try to understand the concepts to be able to explain them to their classmates.

On the other hand, they argue that they would have needed more time to be able to do the task, since the found theoretical and technological difficulties preparing the videos. At this point, greater guidance and follow-up of the work is asked by the student.

Some others voices indicate that *The video idea for explaining hard things is really good, by doing it, I had to put myself into a biochemist' brain, which was not the easy as I have troubles to deal with this subject, but at the end it turned out that I learned a lot by doing "class" myself and it helped me to memorize by trying to explain it to other "lost" brains.*

Figure 2
SEEQ data analysis



The students have proposed some ideas to improve the value of this experience. For example, to increase the learning the work should be started and finished in the class so that teachers can help. Some others propose to watch the video together, so they can discuss and heard direct explanations from their classmates what indicates a better understanding.

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Stecal: a powerful tool for improving the Student Engagement in the design and development of low-alloys steels for high performance applications

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Abstract

In this work, it is presented the use of a specific software known as SteCal 3.0 (Microsoft Windows-based application) which is successfully employed as a didactic and instructional method for future students in Engineering Degrees (mostly Mechanical Engineering, Mechanical Design Engineering and Industrial Technologies Engineering, among others). First of all, it is important to remark that steel is one of the most important metallic materials in our society which can be widely used in a high variety of different sectors such as automotive, construction, structural, packaging or manufacturing, among others. One of the main reasons of this great multifunctionality is associated to its intrinsic properties such as a high mechanical resistance and hardness combined with a high toughness and easy formability. According to this, SteCal is very useful software for comparing the properties of several steels with different chemical composition, which can help to suggest the most appropriate composition for a specific application. As a function of the input experimental parameters (varying alloying elements), this program can help to the students a better comprehension on diverse metallurgical aspects obtainable with low-alloy steels such as thermal behaviour (austenizing temperature, eutectoid reaction, normalizing, quenching, tempering) as well as important concepts related to the resultant mechanical properties (martensitic structure, susceptibility to quench-cracking, hardness, Jominy End-Quench hardenability). Due to this, two different types of steel with different chemical composition are evaluated according to the designation from the American Iron and Steel Institute (AISI) such as AISI 1330 and AISI 4147, respectively. Finally, a better student engagement has been observed along all these years of implementation of this didactic software because the future students in Engineering Degrees can deep about theoretical and important concepts with the aim of designing steels with specific properties of high technological interest.

1. Introducción

El acero es uno de los materiales más importantes de nuestra sociedad ya que es usado en una amplia variedad de sectores diferentes (automoción, industria, estructural, construcción) debido a sus interesantes características intrínsecas y por ello, es considerado como uno de los materiales fundamentales del tercer milenio en el que vivimos. Todo ello es debido a que presenta una serie de atributos que le hacen diferente en comparación con otro tipo de materiales tales como sus buenas propiedades mecánicas, su facilidad de conformado en caliente y en frío, facilidad de mecanizado y ensamblaje mediante soldadura u otros procesos de unión y una excelente protección contra la corrosión a través de alteraciones en su composición química (aceros inoxidables) o por la aplicación de recubrimientos específicos (galvanizados). Además, otra notoria ventaja añadida es que la materia prima para su obtención (mineral de hierro) es muy abundante en la corteza terrestre, siendo su producción un orden de 20 veces superior que el resto de los materiales metálicos no ferrosos [1].

Atendiendo a su clasificación, una de las formas más sencillas es respecto a su composición química estableciendo una clasificación en aceros no aleados y aceros aleados. El primer

grupo (no aleado) corresponde a los aceros al carbono en los que su estructura de equilibrio se puede deducir del diagrama hierro-carbono (Fe-C) con un contenido máximo de carbono admitido de hasta 2.1% C. El segundo grupo corresponde a los aceros aleados que se basan en la adición de cantidades variables de elementos de aleación que pueden alterar significativamente este diagrama de equilibrio de Fe-C. Además, un aspecto importante es que la adición de estos elementos de aleación tiene diversos efectos en la microestructura y en las propiedades mecánicas de los aceros obtenidos (dureza, resistencia al desgaste, resistencia mecánica), permitiendo la obtención de aceros de altas prestaciones, siendo su precio más elevado que el de los aceros al carbono ordinarios.

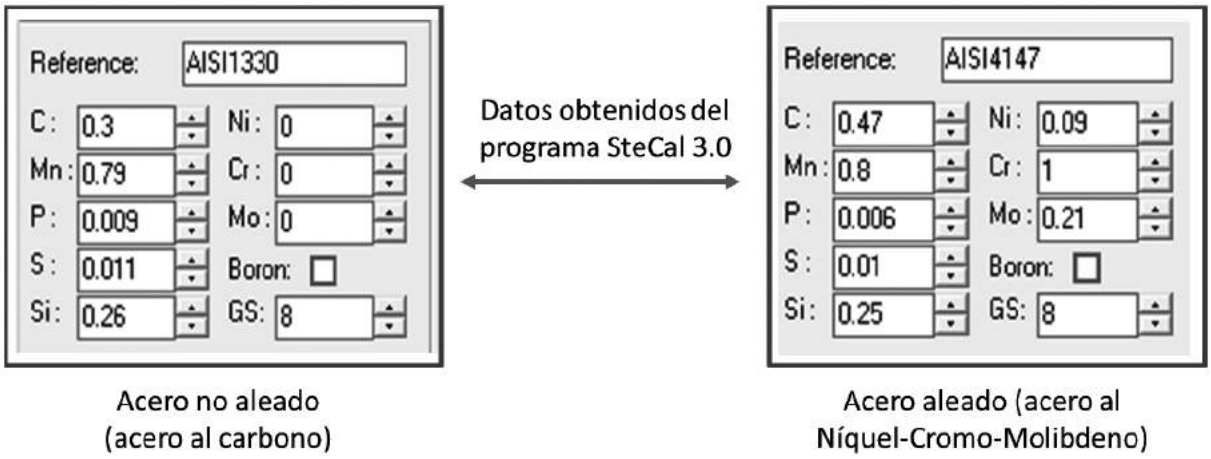
En este trabajo se propone el estudio de dos tipos diferentes de aceros (aleado y sin alear) mediante el uso de un software informático conocido como SteCal, con el principal objetivo de que los alumnos de Ingeniería puedan establecer diferencias representativas entre ambos tipos de aceros y afianzar conceptos de amplio uso en el ámbito metalúrgico (templabilidad, dureza, martensita, temple, revenido) [2]. Por último, se ha observado una participación más activa de los estudiantes a lo largo de todos estos años de implementación de este software didáctico ya que los alumnos pueden profundizar en conceptos teóricos e importantes con el objetivo de diseñar aceros con propiedades específicas de alto interés tecnológico.

2. Desarrollo metodológico

En este trabajo se han seleccionado dos tipos diferentes de acero conocidos como AISI1330 (acero no aleado) y AISI4147 (acero aleado). En la Figura 1, se puede apreciar la composición química de cada uno de ellos que ha sido obtenida por programa informático SteCal 3.0, respectivamente [3].

Figura 1

Composición química de los dos aceros analizados en este trabajo que son el AISI 1330 (acero al carbono) y el AISI 4147 (acero al Níquel-Cromo-Molibdeno), respectivamente



El principal objetivo es evaluar el efecto que tiene la adición de elementos de aleación (Molibdeno, Cromo, Níquel) en las propiedades mecánicas de un acero en comparación con un acero no aleado (acero al carbono). En la Tabla 1, se puede ver el efecto que presenta en la localización del punto eutectoide, la susceptibilidad a rotura por temple y la temperatura

máxima de austenización para cada uno de los dos aceros analizados. Lo primero a resaltar es que hay un cambio en la localización del punto eutectoide hacia porcentajes más bajos de carbono y a una temperatura más elevada del acero aleado (AISI4147) en comparación con el acero sin alear (AISI1330). Además, la susceptibilidad de rotura por proceso de temple de los aceros analizados es baja para el acero AISI 1330, mientras que para el acero AISI 4147 es alta debido a que se produce estructura martensítica tanto en la superficie como en el núcleo por lo que es necesario un proceso posterior de revenido para aliviar las tensiones internas originadas en la muestra metálica.

Tabla 1
Localización de los puntos críticos del diagrama Fe-C (temperatura y composición eutectoide), la temperatura de austenización y la susceptibilidad de rotura tras proceso de temple

Tipo de acero	Temperatura eutectoide	Composición eutectoide	Temperatura austenización	Susceptibilidad rotura temple
AISI 1330	726 ºC	0.69 %C	835 ºC	Baja
AISI 4147	741 ºC	0.59 %C	846 ºC	Alta

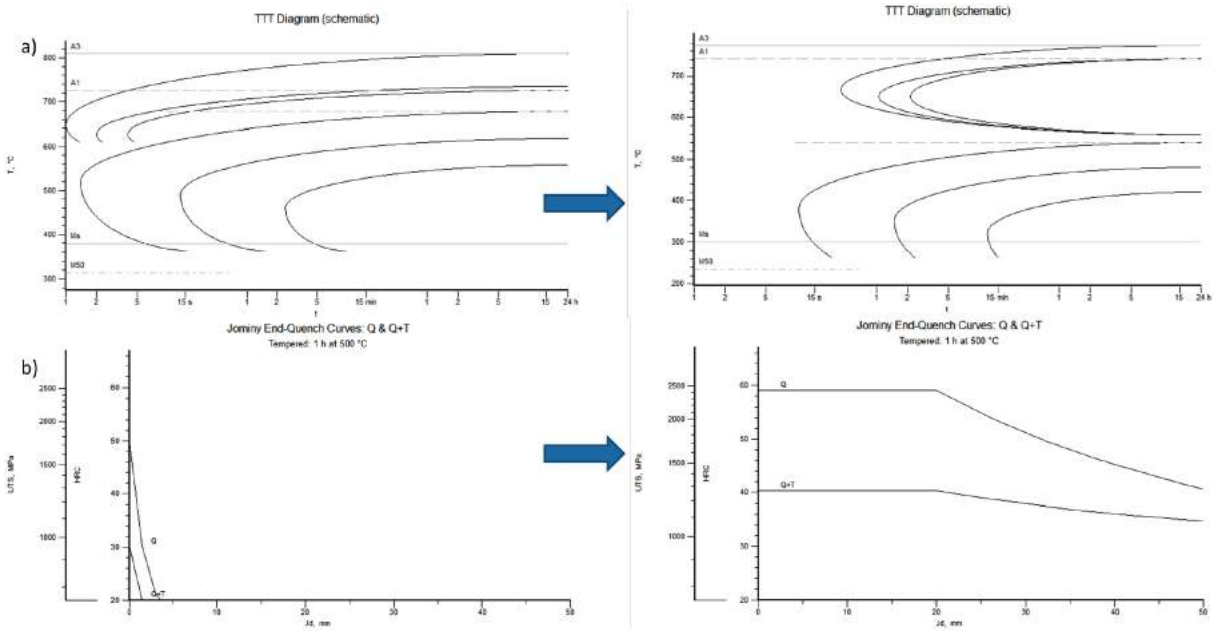
Con esta primera aproximación, los alumnos ya pueden interiorizar la existencia de dos tratamientos térmicos ampliamente conocidos en la industria del acero y en metalurgia como son el proceso de temple y el de revenido, así como el efecto que tiene el revenido para proporcionar un mayor grado de ductilidad con el objetivo de liberar las tensiones internas producidas tras el proceso de temple para el acero aleado (AISI4147), que está directamente asociado con la susceptibilidad de rotura tras proceso de temple (alta).

Otro aspecto a resaltar es el efecto de la adición de los elementos de aleación en las curvas tiempo-temperatura-transformación (TTT) ya que produce un desplazamiento de estas curvas hacia la derecha con respecto al intervalo tiempo (Fig. 2a derecha) en comparación con la muestra de AISI1330 (Fig. 2a izquierda). Además, este efecto está directamente relacionado con el ensayo Jominy (Fig. 2b) en donde se puede apreciar valores muy elevados de dureza superficial así como en profundidad hasta 20 mm (58 HRc) indicativo que tras proceso de temple en agua se obtiene una estructura de elevada dureza como es la estructura martensítica (Fig. 2b derecha) en comparación con el acero sin alear (Fig. 2b izquierda) en donde la dureza produce una caída en profundidad indicando que la microestructura correspondiente está formada por microconstituyentes de menor dureza (perlita o bainita) [4].

Por último, los resultados académicos obtenidos desde la implementación de SteCal han sido muy satisfactorios porque se ha producido una tasa de aprobados más elevada en comparación con años anteriores y además, en las encuestas docentes se produce una valoración positiva de este programa ya que los alumnos pueden indagar con mayor detalle y profundidad en aspectos teóricos expuestos en sesiones magistrales.

Figura 2

Diagrama tiempo-temperatura-transformación (TTT) (Fig. 2a) y ensayo Jominy (Fig. 2b) de los dos aceros analizados AISI1330 (izquierda) y el AISI4127 (derecha), respectivamente



3. Conclusiones

Desde la implementación de SteCal 3.0 como software didáctico en el ámbito del Área de Ciencia de los Materiales e Ingeniería Metalúrgica en nuestra Universidad se ha apreciado un alto grado de implicación y participación de los estudiantes. La razón principal es que este programa es un programa muy intuitivo para predecir las propiedades de los aceros así como su forma de obtención. En este sentido, los estudiantes de Grados de Ingeniería profundizan conceptos teóricos e importantes relacionados con las propiedades térmicas y mecánicas de los aceros. Finalmente, otro aspecto a destacar es que se trata de un aprendizaje basado en la indagación porque los estudiantes analizan los resultados experimentales, que los asocian con los conceptos teóricos previamente explicados en sesiones magistrales, pudiendo diseñar aceros de altas prestaciones tecnológicas.

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DISCs Poster Presentation for EuroSoTL 2019

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Abstract

This poster reports on a new project to develop the capacity of teaching and learning in Irish Higher Education (HE) to effectively engage with societal challenges. This project is in its early stages and as such, does not report findings at this time.

1. Introduction

The project is titled DISCs: Disciplines Inquiring into Societal Challenges, and is funded by the National Forum for the Enhancement of Teaching and Learning in HE (Ireland). DISCs is shared across three Irish universities (University College Cork [UCC, lead partner], Maynooth University and Dublin City University), and their respective student unions, and involves academic, administrative and student representation. The project supports the embedding of national HE, and international Sustainable Development priorities regarding gender-consciousness, intercultural engagement and community-oriented learning in HE. Heath *et al.* (2017) argue that since so many professions require engagement with sensitive content, educators' capacity to respond appropriately is crucial to student attainment of discipline-specific competencies, as well as students' capacity to serve future communities. Responding to this concern, a specific aim of the project is to identify key skills, values, competencies and approaches to learning outcomes that must be developed by teachers across HE disciplines. The purpose of this focus is to embed consciousness of and engagement with intercultural, gender-conscious and community-oriented teaching across the HE sector. Ultimately, a DISCs Strategy and Implementation Plan will be developed for the HE teaching and learning sector in Ireland.

Further research questions relating to this project are as follows:

1. What are the broad experiences of students in STEM, AHSS and Business and Law disciplines regarding teacher/lecturer engagement of gender, intercultural and community issues in the classroom? How can these experiences inform the professional development of all DISCs Advocates?
2. What are the strengths, interests and areas for development of a purposive sample of 3rd level staff in STEM, AHSS and Business and Law disciplines regarding engagement of gender, intercultural and community issues in their classroom?
3. How do DISCs Advocates who have completed a period of professional development in relation to intercultural, community and gender issues during the project evaluate their experience?

Below, we briefly outline the thematic underpinnings of the DISCs pilot values, competencies and learning outcomes professional development framework. We also outline the planned process of engaging students and DISCs Advocates. DISCs Advocates will enact and explore the developing values, competencies and skills framework through

structured professional development across disciplines and universities in Ireland and by sharing their professional development publicly (online).

2. Focusing on Values, Skills and Learning Outcomes

Drawing on the literature, professional values regarding respect for identities, empathy, and justice, skills such as critical thinking, and a commitment to sensitively challenge privilege and moral relativism (Cook-Sather and Des-Ogugua 2018; Kitching 2019) have been identified as critical for DISCs-related professional development. Competencies and skills in teaching through uncomfortable emotions and writing affective learning goals (Boler 1998; Boler and Zembylas 2003), effective intercultural communication and productively engaging conflicts of values (Ross 2013), and redistributing intellectual resources in hybrid (digital and non-digital) ways that challenges the individualisation of student experiences and HE careers (Leibowitz and Bolazek 2016) are identified as significant. Finally, appropriate understanding of and engagement with students' modes of learning and identities through culturally specific understandings of 'universal' design are prioritised (Chita-Tegmark *et al.*, 2011). Arising from this review, 5 key themes have been identified by the DISCs project team through which we will seek to develop a range of intercultural, gender concious and community-oriented values, competencies and outcomes amongst DISCs Champions:

— Identity and Belonging.
— Power Relationships.
— Challenging Bias, Stigma and Discrimination.
— Social Class and Community.
— Conflict and Consensus.

3. Research and Professional Development Approach

Several steps and data collection measures will be used to map and research staff needs and professional development in experiences in each institution.

1. Focus group data will be generated with students at the beginning of the project. Focus groups will be used as a means of examining a range of issues regarding their experience of gender-conscious, intercultural and community-oriented learning, and to inform the development of the pilot DISCs professional development framework.
2. An invitation to participate in the project will be sent to all staff who teach using an online Expression of Interest Form. This will ask staff what their disciplinary area is, and what their interest is in this project, so that we can purposively sample a maximum of 10 staff for Guided Conversations.
3. A Guided Conversation will take place with 10 interested staff in each institution, to further narrow down our focus to 5 DISCs Advocates in each institution. The Project Officer will create a written record of this Guided Conversation.
4. DISCs Advocates, once identified, will be supported to map their professional development needs and their teaching strengths both to Ireland's National Professional Development Framework and the 5 key themes outlined in the previous section.
5. A series of self-assessment statements about teaching values, competencies and learning outcomes under the 5 key themes will be piloted online, with DISCs

Advocates leading the way in using this publicly available 'spiky profile' tool. Staff will be asked to rate themselves in relation to teaching with and through these themes. A profile will be generated from this which will demonstrate strengths and gaps in expertise and point those participating towards further professional development opportunities.

6. DISCs Advocates' data in the form of vlogs, blogs and Spiky Profile self-assessment snapshots will be shared by the Advocate where they are comfortable to do so, and placed online by the Project Officer with the Advocate's consent.
7. Anonymised student evaluations of Advocates' teaching may be generated by DISCs Advocates towards the end of the project in a maximum of two modules and shared with the project team where both students and staff consent to doing so. This may be used to inform the staff member's professional development journey and the end-of-project research interview
8. DISCs Advocates will be interviewed individually towards the end of the project, to examine the depth and breadth of it, to understand their experiences and to inform the development of policy and research publication in this area.

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SoTL School – An innovative format for professional development of academic staff

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Abstract

The Center for Teaching and Learning Enhancement in Saxony *(Hochschuldidaktisches Zentrum Sachsen-HDS)* offers a comprehensive certificate programme for 13 universities. Within the project "Teaching Practice in Transfer^{plus}" *(Lehrpraxis im Transfer^{plus}-LiT^{plus})* the HDS offers a new format called LiT.School.

At the LiT.School participants from different universities and with a diverse professional background get to know Scholarship of Teaching and Learning (SoTL) and —step by step— design a SoTL project. For one week, they are being instructed and guided by experts regarding data collection and data evaluation. After the school, the participants are prepared to realize their research project independently and have the opportunity to share their experiences regularly in informal meetings with their SoTL peers. After finishing the research projects they publish the results. The intention of the LiT.School is to implement the format 'school' as an incubator for SoTL projects. In the long run an interdisciplinary SoTL community of practice is envisioned spanning different universities in Saxony.

This conference proceeding describes the context in which the LiT.School is embedded and its concept, results and impact hitherto. It gives an idea how centers for teaching and learning enhancement can effectively bring together motivated scholars who are interested in or already practice SoTL, and support them to create sustainable communities of practice.

1. Introduction

The LiT.School is embedded in the Certificate Programme of the Center for Teaching and Learning Enhancement in Saxony (HDS) and in the state-wide joint project "Teaching Practice in Transfer^{plus}" (LiT^{plus}).

1.1. Saxon Certificate for Teaching and Learning

The HDS offers teachers at 13 universities, universities of applied sciences and vocational academies in Saxony a comprehensive qualification programme which comprises three modules with a total of 240 work units (1WU = 45 min.) (cf. HDS):

—Module 1. *Basics (Grundlagen)*

- 60 WU | semester-based | blended-learning format.
- Three on-site workshops: Three-day introductory workshop, workshop on peer coaching, one-day final workshop.
- Practical phase during the semester: online and practical tasks, cooperative classroom visits, completing an (electronic) learning portfolio according to specified criteria.
- *Participation requirements:* Teaching (at least one 90 min lecture/seminar in the corresponding semester).

— Module 2. *In Depth (Vertiefung)*

- 100 WU.
- Workshops and consulting formats in seven fields of action:

  Coaching, Supporting & Interaction (CSI, German = BBI).
  Checking, Grading & Assessing (CGA, German = PBA).
  Evaluating, Reflecting & Quality Development (ERQ).
  Methods, Media & Digital (MMD).
  Diversity, Equal Opportunities & Internationalization (VEI, German = VCI).
  Teaching/Learning Planning & Curriculum Development (TLC, German = LLC).
  Key Qualifications (KQ, German = SQ).

- These can be completed in one semester or spread out over several semesters.
- *Participation requirements:* To be confirmed for each course.

— Module 3. *Application (Anwendung)*

- 80 WU | semester-based.
- Planning, carrying out and evaluating an (individual) innovative teaching/learning project:

  Submission of a sketch of the planned teaching/learning project.
  One-day, on-site workshop (with peer review elements).
  Submission of a project concept.
  Support from a chosen mentor and a peer.
  Completion of an (electronic) learning portfolio according to specified criteria.
  Final workshop and reflection.

- *Participation requirements*: Modules 1 and 2 must be fully completed.

ACTive Teaching

In addition to the HDS Certificate, teachers can participate in part-time, university didactic-related activities within the framework of **AKT**ive Lehre (ACTive Teaching) which comprises three areas:

A = Austausch (Exchange): Peer Formats, Consulting & Coaching (max. 30 WU)

Activities of self-directed formal, non-formal and informal exchange on topics referring teaching in higher education, cooperative teaching, curriculum and study programme development as well as activities which pursue the goal of reflecting and expanding one's own competence in exchange with other teachers can be recognised.

K = Kontinuität (Continuity): Workshops (at least 30 WU)

Activities of formal further qualification in the field of teaching and learning, curriculum and course design which pursue the goal of deepening and broadening one's own didactic knowledge in a structured way can be recognised.

T = Transfer (Transfer): Scholarship & University Public (max. 30 WU)

Activities can be recognised which a) relate to the development of a teaching attitude of one's own in the sense of Scholarship of Teaching and Learning or which

b) serve to communicate good practice examples and research results to the university public.

— *Participation requirements:* None.
— *Structure:* a) Independent participation in university didactic-related activities or b) continuation of the HDS Certificate. After the reviewing of all activities, participants will be awarded with the Saxon Certificate for Teaching and Learning^{plus} (Sächsisches Hochschuldidaktik-Zertifikat^{plus}, 330 WU) including an attendance record for ACTive Teaching.

1.2. LiT^{plus}: Cross-university transfer of good teaching practice

In order to better understand why the LiT.School format was created and what importance it has for the enhancement of teaching and learning in Saxony, the joint project LiT^{plus} will be described in more detail.

LiT^{plus} is a Saxony-wide project funded within the framework of the Quality Pact for Teaching of the German Federal Ministry of Education and Research (BMBF) (duration: 2012-2020) and focuses on the promotion and transfer of good teaching practice across higher education institutions in Saxony (cf. HDS). While universities usually compete with each other, this project successfully relies on the principle of cooperation and the use of synergies in the field of teaching and learning. This is achieved by the following formats:

— LiT.Funding (LiT.Förderung)
  - cooperative teaching projects across university borders with the aim of developing joint modules or courses.
— LiT.Shortcuts
  - short workshops on good practice examples presented by experienced university teachers.
— LiT.Expert Groups (LiT.Facharbeitskreise)
  - self-directed, theme-focused exchange format for university teachers (cf. Seidel *et al.*, 2017).
— LiT.Teaching Consultation (LiT.Lehrberatung)
  - Consulting and supporting the process of teaching development (e.g. individual consulting, group consulting, teaching observations, Teaching Analysis Polls (TAP), feedback on media-supported teaching-learning settings, guidance of collegial advisory rounds, moderation in teaching development).

Altogether, these formats create a communication space spanning across all institutions of higher education in Saxony where university staff can exchange ideas and experiences about good teaching practices. Due to these formats many cooperations and synergies were initiated (cf. Franke, Engbrocks & Bade 2017).

In 2018, the **LiT.School** Scholarship of Teaching and Learning complemented the LiT^{plus} programme. Why was the step to introduce SoTL so significant? In the past, there have always been individual teachers in Module 3 of the HDS Certificate Programme who had a scholarly attitude towards their teaching practice. In Module 3, however, the ability to

reflect is referred primarily to the implementation of new teaching methods and learning settings. Systematic inquiries on student learning as they are intended by SoTL could not be realized within this framework. The reason for the establishment of the LiT.School was to close this gap and offer teachers the opportunity to develop genuine SoTL-projects. Since SoTL includes publication of research results, SoTL activities also enrich the cross-university exchange between teachers – an aspect that is of particular relevance within the context of LiT^{plus}.

2. Concept of the LiT.School

The target group of the LiT.School are experienced university teachers who have completed at least Module 1 of the HDS Certificate Programme. This ensures that the participants have a basic understanding of teaching and learning, so they can focus entirely on their research project during the school. The LiT.School is interdisciplinary and at the same time promotes a subject-specific perspective on teaching and learning, since the research projects address challenges in respective subjects or disciplines.

The LiT.School is offered once a year for 10-15 teachers. Based on the course of a typical research process, the participants develop their own SoTL project. The school starts with an individual reflection on subject-specific challenges in teaching and learning with the help of the decoding the discipline approach (Middendorf & Pace 2004). On the basis of so-called "bottlenecks", which obstruct the learning process of students, the participants develop a research question and a suitable research design. Each step is accompanied by inputs from experts, independent study phases and group discussions. Another important component is the individual consultation with the SoTL-experts. At the end of the LiT.School all participants will have developed a coherent research design, which they implement independently in the following semester. During this time they are accompanied by several moderated peer meetings within the framework of a LiT.Expert Group (s.a.).

Community building is essential for the development of SoTL (Huber 2014, p. 33). The LiT.Expert Group on SoTL could be seen as the starting point of a Community of Practice (Wenger 2007). Its members share the objective to develop their competences in the field of SoTL. On the one hand, the group is based on the principle of collegial consultation (Tietze 2010), where the participants give peer-feedback referring their SoTL-projects. On the other hand, the involvement of external experts will be essential for the continuous professionalisation of the community. The organisational support by a professional moderator seems to be crucial in the initial phase. Looking at our experience, it is vital that the open and positive working atmosphere generated during the week-long LiT. School is promptly transferred into a follow-up peer meeting. Once a SoTL community of practice is established, responsibility for the organization of the meetings can be transferred entirely to the group.

3. Conclusions

The evaluation of the first LiT.School, which took place in September 2018, was very positive: All participants stated in the evaluation sheet that the school was worthwhile and helped them to develop their research project further. Meanwhile, participants presented (intermediate) results of their SoTL projects at several conferences, e.g. the annual conference of the German Association for Educational and Academic Staff Development in Higher

Education *(Deutsche Gesellschaft für Hochschuldidaktik-DGHD)* in March 2019. One participant is planning a special disciplinary edition with SoTL contributions. The LiT.School also led to new collaborations, e.g. joint development of innovative teaching formats.

Based on the feedback from participants, we can draw first conclusions about the motivation of teachers to invest time and energy in SoTL. The self-determination theory of Deci & Ryan (1993, p. 229) asserts three psychological needs that are equally important for intrinsic and extrinsic motivation:

— need for competence
— need for autonomy
— need for social relatedness.

The feedback we get shows, that there are several university teachers who work in an academic environment where they have to justify themselves for why they care about student's learning and are willing to invest time to enhance their teaching skills. Particularly teachers who are forced to defend their commitment within a disciplinary culture, that ranks excellent research always above excellent teaching, gain autonomy and self-esteem when they can prove to their colleagues the positive effects of teaching innovations by their SoTL results.

SoTL also broadens the competence of university teachers in their role as researchers, since SoTL allows them to distinguish themselves in an additional research field alongside their genuine subject.

Last but not least, the quality and quantity of exchanges with other colleagues during a one-week school is a strong motivator to commit to SoTL. The school and the subsequent peer processes can compensate the often missing discourse on good teaching practice at university departments and meet the need of social relatedness.

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Does a brief mindfulness practice in lectures affect the experience of flow?

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Abstract

Learning might be understood broadly to include not only disciplinary knowledge or skill development, but also the cultivation of intention and attitudes that connect to learning and a learning community. Higher education has seen a growing interest in mindfulness, contemplative education, and transformative learning. Yet, little is understood about key questions such as the effects on the teacher *and* the learners, or how contemplative practices can be integrated into specific disciplines, for example Chemistry, and what contributions such practices can make. The project introduced interventions into the learning (and teaching) experience by making a contemplative (mindfulness) practice available to the students and lecturer at the beginning of lectures. To explore the students' experience, quantitative and qualitative data was gathered.

Students in a first-year undergraduate Chemistry course participated in the study. At the start of a block of 8 lectures, a brief (1 min) mindfulness practice was given by the lecturer, immediately followed by an invite for students to explicitly set an 'intention' for the learning for that lecture. 'Flow' was expected to increase; here understood as a focussed engagement with the learning process (as perceived by each person themselves). Evidence of student experiences of flow was gathered by inviting students to fill in the Flow Short Scale questionnaire at different times, after the 1st lecture (pre-intervention), and after the final 8th lecture (post-intervention). Additionally, students gave open-ended, written feedback after the final lecture, and a semi-structured interview was conducted with one (volunteer) student. This poster will present the questionnaire and feedback findings.

Initial data analysis showed no significant difference in the reported flow experience from doing the mindfulness and 'intention setting' practice. Yet, interesting comments were found in the feedback.

1. Introduction

Higher education has seen a growing interest in contemplative practices such as mindfulness in recent years. Two patterns seem to emerge, mindfulness in and as education.(1) The former is mindfulness interventions aimed at improving mental–physical health, social–emotional learning and cognitive functions. The latter is mindfulness integrated into teaching in order to enhance transformative learning processes.(1) Transformative can at times manifest in contemplative education.(2) Contemplative education, is in this context defined as 'a set of practices that may foster particular forms of awareness in students, forms conducive to the conscious motivation and regulation of learning, and also to freedom and transcendence in life more generally.'(3) Transformative approaches are interested in matters beyond mere knowledge, as exemplified in Beck *et al.*(4) exploration of the benefits of applying a bildung/formation approach in professional learning. In transformative learning, mindfulness practice can play an important part by strengthening the interest and capacity to observe frames of reference which influence one's actions, for example greater or

less engagement in a learning process. In this project, mindfulness is defined as 'deliberately focussing attention in the present moment, without judgment, to the experience that unfolds'.[5] The key components are attention, intention, presence and openness.

Both authors are mindfulness practitioners, and consider our mindfulness practice an essential aspect of who we are and how we teach and learn. We are exploring ways of sharing this with interested students and colleagues. A dilemma is how to make the possibility of engaging in such practices known, and how to give an initial experience with such practices, without interfering or 'pushing' this onto our students. This Short Paper describes one effort made with Chemistry students during an 8-week lecture series, conducted by one of the authors (Wehmeier).

The intention of the project was to make a contemplative practice, like mindfulness, available to students at the start of the lecture, as well as inviting the setting of an 'intention' for their learning. While the instructions were given to the lecture hall as such, students were told that participation was fully voluntary.

Mindfulness and related practices are notoriously difficult to demonstrate. With the broad definition of mindfulness from which we work, the effects —if any— are ephemeral, individual, may manifest in highly personal ways, and may take years to bloom. Yet, we were interested to challenge ourselves to explore ways in which we might trace effects in externally recordable ways. Mindfulness has been positively associated with flow studies conducted in sport contexts.[6] Further, it has been shown that the felt control facet of flow was positively associated with mindfulness, although the absorption facet of flow, which is the feeling of being carried away by activity, did not correlate positively with mindfulness.[7] Thus, we chose to explore the effect on the students learning experience using an existing questionnaire (the Flow Short Scale questionnaire). Based on flow theory, student learning engagement encompasses concentration, enjoyment, and interest; when focusing on individual learning experiences, flow can be understood as a combination of challenge and environmental support.[8] If the interventions could be shown to increase flow, we could reasonably claim that they facilitate student engagement in learning. In other words, as flow and mindfulness are associated with present-moment as focus of attention, the hypothesis for the quantitative part of the study was an enhanced measure of flow experience over the intervention period. Further, to more openly glimpse students' experiences, qualitative data was collected using open-ended questions.

2. Method

The study was integrated into an 8-lecture series in a level-1 Chemistry course at a university in the UK. The 1st lecture was used as a control point (no intervention). From the 2nd lecture onwards, a brief (1 min) mindfulness practice was guided by the lecturer at the beginning of each lecture. This was followed by an invite for students to write down an intention for their learning during the lecture. The students' experience of flow was measured using a Flow Short Scale[9]. These were filled in at the end of two lectures: 1st lecture (pre-intervention, n = 31) and final 8th lecture (post-intervention, n = 25). The items of the Flow Short Scale measure components of flow experience with a Likert-type scale (from 1 = 'not at all' to 7 = 'very much'). Collected data were analysed using IBM Statistical Package for the Social Sciences (SPSS) Version 25. The median value of the flow was calculated, and a Wilcoxon signed-rank test was applied to analyse whether changes attributable to the intervention, led overall to a statistically significant difference in the flow experience in the lecture. Additionally, after the final 8th lecture, written feedback was collected (completion 17/25 (70%)) using open-ended questions.

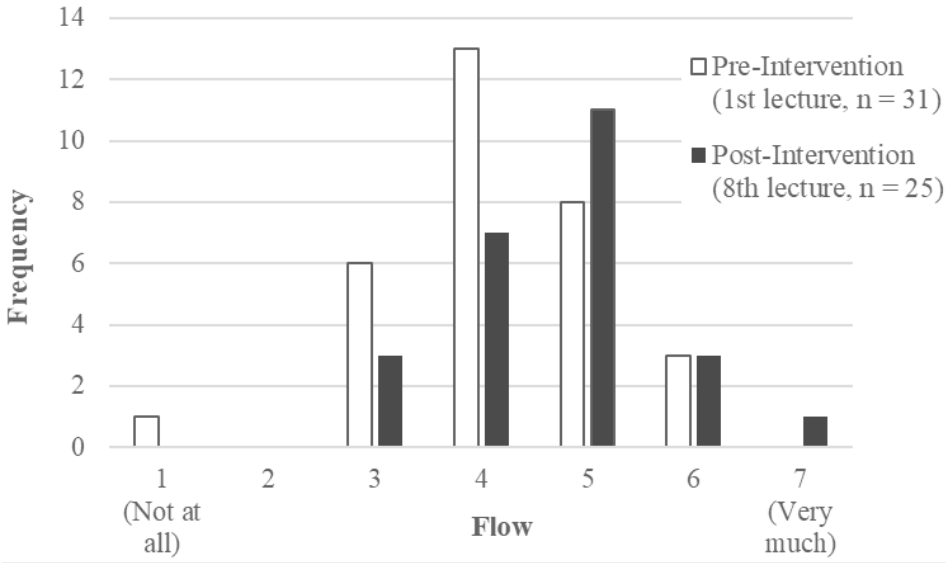
3. Outcomes

3.1. Quantitative findings

The median flow rating was 4 and 5 respectively for pre- and post-intervention and is presented in figure 1. The introduction of the intervention in the lectures did not elicit a statistically significant change in students flow experience (p = 0.142).

Figure 1

Frequency of Flow median values from Flow Short Scale pre- and post-intervention



Discussion: This study did not measure the association between mindfulness and the state of flow in the learning experience, and it was not recorded which students actually took part in the intervention, as students were given the choice to engage or not. Capturing the flow experience might be too complex considering the brief intervention, or the effect may be small and requires larger numbers of participants.

3.2. Qualitative findings

The student feedback to the question 'Please describe how this activity has influenced your learning' indicated that for some, the 'intention setting' supported a transformation in the approach to learning.

> "I pay more attention to why I am in the lecture at all."
>
> "I feel so much more focussed and I actually feel a huge difference to how much I am taking in from the lecture."

These student voices indicated an enhanced flow experience associated with attention and learning motivation due to the mindfulness and 'intention setting' practice. However, two students found the mindfulness intervention not supportive:

> "This activity has not influenced my learning very much if anything it has reduced the time available to learn in."

Thus, we see that the intervention received attention, and a substantial distance between how it was perceived (as a helpful or unhelpful part of attending the lectures).

4. Conclusions

Although the intervention was kept brief, a non-traditional learning approach such as this in a traditional science discipline, like Chemistry, might not be welcomed by some students. In particular, it goes against the grain of the contemporary, "throughput" and career-focussed, world of higher education. Forbes has argued that "Mindfulness in education offers an opportunity to reorient education away from narrowly conceived instrumental ends towards broader ethical and socially-engaged ones". Rather employing mindfulness as a means of self-regulation, education offers a way to attain awakening toward moral stages of self, cultural, and societal development.[10] For now, the project made one of the researchers aware of the question of different purposes for mindfulness in education, and both researchers aware of the centrality of this seemingly theoretical question to the practice of applying such approaches – and attempting to gauge their impact. We wonder what might be collective/community conditions which facilitate or hamper student acceptance of such mindfulness interventions in a lecture.

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Evaluation of teaching, supervision and SoTL in reviews of professors' qualifications

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Abstract

We have analysed external reviews of educational qualifications in 86 recent full professorship appointment and promotion assessments within three faculties of a research-intensive university. The purpose is to provide empirical data as a basis for development of instructions to external reviewers and university teacher hiring committees. In conclusion, reviews of educational skills are mainly very brief. They mention quantifiable merits but largely avoid making coherent qualitative assessments of educational skills.

1. Research Questions

The questions discussed and explicitly answered in our study are:

- To what extent are educational qualifications reflected in the external reviews?
- Which educational themes are visible, and which are potentially missing in the reviews?
- How do external reviews justify candidates' educational qualifications?
- What views on educational qualifications are conveyed by the reviewers?

2. Methods

The method used in this study is document analysis. We have collected the external reviews of 86 recent (2012-2017) full professorship appointments and promotions. The analysis has been done using a framework from a research-group doing a similar study in another Scandinavian research-intensive university [1, 2]. This framework provided initial thematic categories used for our analysis. However, in our data we also inductively identified additional relevant observations, such as the common mentioning of personal characteristics as a merit and a somewhat superficial treatment of a substantial, coherent teaching portfolio.

3. Outcomes

Overall, external reviewers use much less text space on commenting educational qualifications compared to comments about scientific qualifications (Fig. 1).

The reviews are mainly focused on aspects of teaching and supervision that are easily quantifiable, such as years of teaching experience, or on personal characteristics that supposedly lead to good teaching and student learning, such as enthusiasm or engagement. Other recurring themes are breadth and depth of teaching and supervision experience (Fig. 2).

Figure 1

Length of professor reviews in terms of educational and research skills

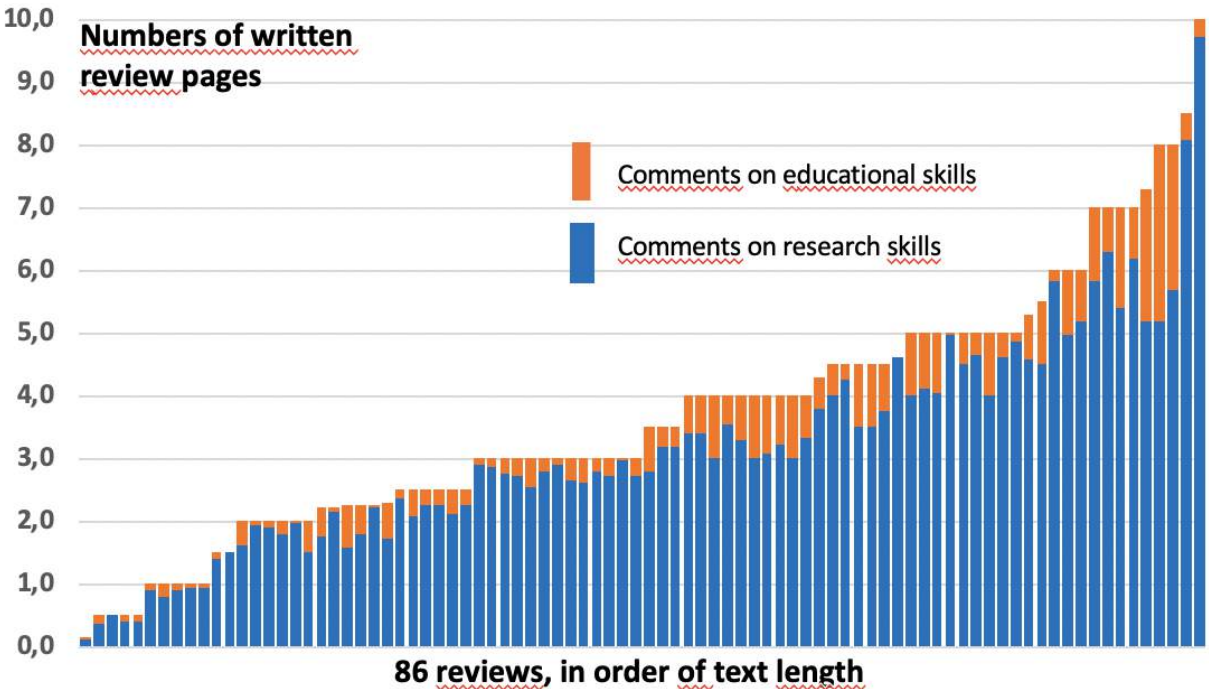
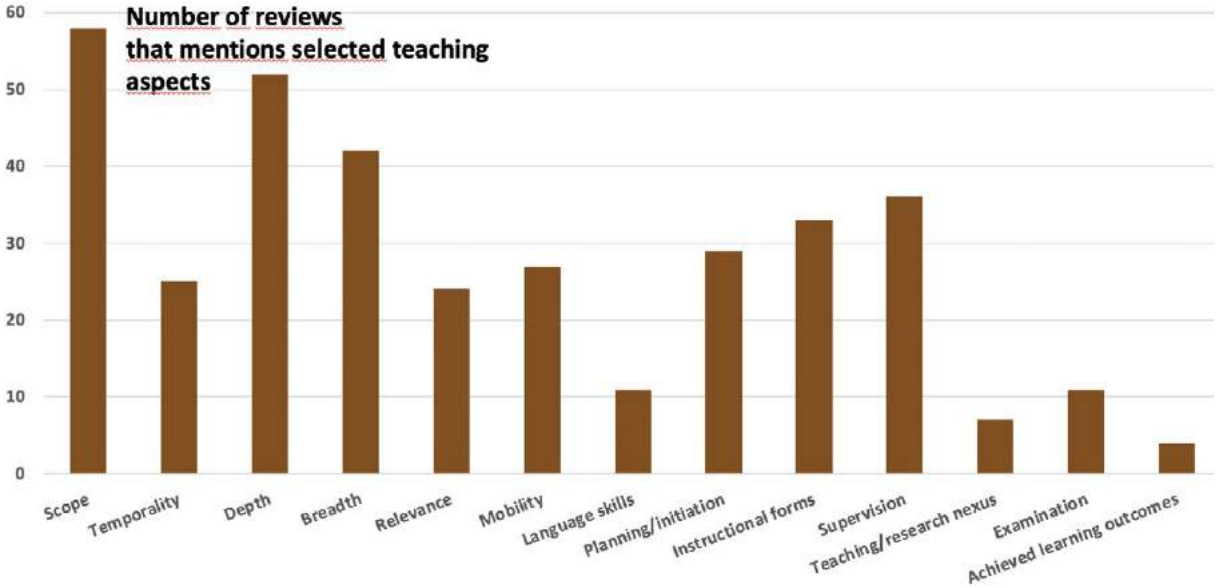


Figure 2

Number of reviews that mentions selected teaching aspects



In conclusion, acknowledgement and recognition of SoTL-work is largely missing, along with qualitative assessments of teaching practices, student learning outcomes and educational development. We therefore see ample opportunities to raise the demands of the

qualities of external reviews with regard to educational qualifications. After all, recruitment and promotion of skilled university teachers remains one of the best ways of improving higher education institutions [3, 4]. One way to achieve this is to clarify instructions to external reviewers, thus facilitating the work of appointment committees. In the long-term perspective, the results of this study might contribute to an academic culture that learns how to pay thorough attention to important aspects of educational qualifications.

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'Apologies I can't be there...': Encountering and countering academic disinterest in SoTL–related continuing professional development

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Abstract

This paper reflects on the challenges of shaping change in teaching and learning culture at disciplinary level. It introduces a project called *Social Policy Educators: Enhancing Digital Skills* (SPEEDS), which is a national initiative that has been in operation over the past two and a half years. As a project focusing on Continuing Professional Development, its core aim is to expand social policy educators' digital capacities in teaching and learning practice through providing training in collaboration with learning technologists and instructional designers across Ireland.

This paper describes the professional development initiatives introduced through this project and comments on their impact. Furthermore, it presents the experiences of two of the lead academics who designed and implemented the project. Their initial belief was that colleagues would be enthusiastic learners who would be highly interested in developing digital skills. However, this assumption proved to be problematic and to obfuscate significant tensions associated with teaching and learning in the neoliberalised 21st century institution. These issues manifest as academics' apparent lack of investment in the project, stemming from lack of time, lack of confidence, and a lack of incentive to learn new skills. These appear to be connected to snobbery about the relative value of SoTL and the low status of teaching and learning-oriented research by comparison with disciplinary research.

This paper is informed by SoTL literature on barriers to change (Brownell and Tanner, 2012). It examines ideas relevant to leadership for change (Miller-Young *et al.*, 2017) from the perspective of early career academics seeking to improve teaching and learning practices within their discipline, thereby strengthening its contemporary impact and relevance. It looks for ways of invigorating practice through building on microcultures in higher education institutions that facilitate informal learning (Roxå and Mårtensson, 2015) and explores pathways for creating cultural change through nurturing supportive, positive, and inventive professional social practices and social relations.

1. About the Speeds Project

Social Policy Educators: Enhancing Digital Skills (SPEEDS) is a project funded by the National Forum for the Enhancement of Teaching and Learning in Higher Education in Ireland. The project strives to foster cultural change in social policy education, based on commitment to improving disciplinary teaching and learning practices, enhancing educators' digital skills, and committing to continuing professional development. Over the past two and a half years, participating academics and instructional designers have engaged in various group and one-to-one training and development initiatives with these objectives in mind.

Approximately 60 participants have by now engaged in various training initiatives through SPEEDS, which has encouraged the introduction of novel technology-enhanced teaching practices in social policy and cognate disciplines. Some innovations are implemented by individual practitioners in collaboration with the institutional leads and learning technologists. Several participants have already been awarded Digital Badges in recognition of their achievements, while many others are working towards this goal.

2. Impact of the Speeds Project

The project has achieved a positive impact in facilitating the development of digital literacies within our discipline(s). Participants have been active in developing their own and others' CPD activities teaching and learning practices and digital skills. Aside from formal training, everyday SoTL-oriented conversations are now taking place between colleagues and more informal training is happening quietly and behind closed doors in various participants' offices.

With respect to the impact on the project team, the experience of leading this project has been hugely rewarding in terms of the observable benefits for staff and students. We have built strong collaborative partnerships within our institutions and have embarked on the development of a promising, generous, supportive and interesting community of practice. We also look forward to seeing the inter-institutional disciplinary network develop further over coming years. Participation in this project has afforded us the resources and freedom to explore different practices, to be more creative in our approaches to teaching and learning, and to experiment with innovative tools, as already evidenced in specific examples above.

3. Changing Mindsets

This aspect of the project's impact is possibly the most difficult to gauge. Implementation of the project has shown that there was a large group of educators who were positively predisposed to adopting digital pedagogies from the outset. This first group of 'Digital Champions' has evolved its practices in exciting ways and engagement with these colleagues is energising and inspiring. However, it is true to say that we have met with some resistance. Educators sometimes feel quite vulnerable about their digital capacities and their response to being invited to develop their skills in this regard is oftentimes reluctant and sometimes hostile. We have observed occasional snobbery with regard to the scholarship of teaching and learning; that this is not 'real' scholarship and/or that is less scientific, valuable, and important than other/disciplinary academic research. We have also noted that when people are feeling under pressure (which is regularly) that engagement in training relevant to teaching and learning practice is the first aspect of their work that they will sacrifice in favour of other activities that they deem more significant or that they believe the institution deems more valuable. Hence the title of this paper, which references the last-minute apologies that were regularly received shortly before various training and workshop events.

These attitudes are being altered to a degree by the increasing emphasis being accorded to Teaching and Learning in promotion and advancement policies. People will engage more readily if they feel it is expedient to do so. However, our experience evidences that it is important that engagement in training in T&L practices is not reduced to a tokenistic exercise for promotional ends as this would ultimately undermine the enterprise.

As Brownell & Tanner (2012) observe, 'Change is difficult in any setting but changing academic teaching appears to be especially tricky'. Our experiences to date corroborate Brownell and Tanner's observations that many educators feel ill-prepared and ill-equipped to change the ways in which they teach, in this case, by incorporating digital technologies in to their teaching and learning practices. Educators report that they lack knowledge about the kinds of digital tools that are appropriate for meeting different teaching and learning needs. Educators may also be unconvinced about the efficacy of digital tools in delivering learning outcomes and about whether the use of digital tools is more effective than traditional methods of engagement. Most educators recognise that they need training, but even the most

well-intentioned find it difficult to find or create time for engaging in training in the face of competing demands. This is particularly problematic in a context where research outputs and external research funding are —or are perceived to be— better recognised and rewarded than teaching innovation (in progression and promotion, for example). Researching digital tools, learning how to use them, helping students to use these tools, reflecting on and assessing the impact of the tools for student learning, documenting evidence-based teaching practice, etc… each of these tasks is time-consuming, yet little allowance is made in educators' timetables for implementing change. Thus, as Brownell & Tanner also argue, incentivising pedagogical change is crucial, 'in the form of lower teaching loads, financial benefits, recognition for tenure, teaching awards, or even, at the most basic level, verbal acknowledgment from colleagues and supervisors' (2012: 340). Our experience also resonates with those documented by Miller-Young *et al.* (2017), who develop understandings about 'leading up', referring the capacity of disciplinary SoTL scholars to influence macro-level policy within institutions. This is also relevant to Roxå and Mårtensson's (2015) conceptualisation of microcultures in higher education institutions based on experiences of shared responsibility and levels of trust; this is a valuable heuristic for future evaluation of the project's longer-term impact.

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La necesaria implicación de los estudiantes universitarios en la evaluación de sus competencias genéricas para garantizar un aprendizaje efectivo, significativo y transferible del proceso de desarrollo competencial

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Resumen

En la Universidad actual, como consecuencia de la convergencia europea para la creación del EEES, los programas se diseñan por competencias, cambio que debe afectar a las metodologías de evaluación de los aprendizajes en aras a la coherencia del modelo de formación.

En este contexto, la evaluación formativa adquiere una relevancia especial (López-Pastor, 2011), por su contribución al fomento de la toma de consciencia por parte de los estudiantes de su propio aprendizaje (metacognición). Dos de las estrategias clave para promover la evaluación formativa son el *feedback* y el *feedforward*. Ambos pueden proceder de diferentes fuentes: del profesor/a, de los compañeros/as y/o incluso del propio estudiante.

Para ser efectivos, el *feedback* y el *feedforward* deben cumplir una serie de características (Cano y Cabrera, 2013; Nicol y Macfarlane-Dick, 2006) y tanto los estudiantes como el profesorado deben formarse antes de participar en los procesos de autoevaluación y evaluación de los compañeros/as o alumnos/as (Strijbos, Narciss y Dunnebier, 2010).

Esta comunicación presenta un estudio de caso llevado a cabo en la Universidad de Deusto, durante el curso 2018-19, para la evaluación de la competencia genérica Comunicación Escrita, en la asignatura Matemáticas y su Didáctica del Doble Grado de Ciencias de la Actividad Física y del Deporte y Educación Primaria, en la que feedback y feedforward son proporcionados tanto por el profesor como por los estudiantes. Se exponen los resultados logrados hasta este momento, ya que sólo se dispondrá de los finales a partir del próximo mes de junio.

Abstract

As a result of European convergence for the creation of the EHEA, today's university programmes are designed by competencies. This change should affect the methodologies for evaluating learning in order to ensure the coherence of the training model.

In this context, formative evaluation becomes especially relevant (López-Pastor, 2011) due to its contribution to the promotion of students' awareness of their own learning (metacognition). Feedback and feedforward are two of the key strategies for promoting formative assessment. Both can come from different providers: from the teacher, from peers and/or even from the student him/herself.

In order to be effective, feedback and feedforward must meet certain requirements (Cano & Cabrera, 2013; Nicol & Macfarlane-Dick, 2006) and both students and teachers must be trained before participating in self and peer assessment processes (Strijbos, Narciss & Dunnebier, 2010).

This paper presents a case study carried out in the 2018-19 academic year at the University of Deusto to evaluate Written Communication as a generic competence in the subject Mathematics and its Didactics in the Double Degree Sciences of Physical Activity and Sport and Primary Education. Feedback and feedforward are provided by both the teacher and the students. We present the results achieved up to this moment, as the conclusive results will only be available from next June.

1. La evaluación formativa y sus mecanismos básicos para el logro de un aprendizaje competencial efectivo, significativo y transferible

El aprendizaje autónomo y significativo, que exige la toma de consciencia por parte de los estudiantes de su propio aprendizaje (Cano y Cabrera, 2013; Gómez, Tejeiro y Foncubierta, 2013; Nicol y Macfarlane-Dick, 2006), se convierte en el gran reto a conseguir en el EEES, orientado hacia la adquisición y el desarrollo de competencias a lo largo de la vida.

La metacognición, entendida como el conocimiento que las personas construyen respecto del propio funcionamiento cognitivo (Carretero, 2001), constituye la base de este aprendizaje (Osses y Jaramillo, 2008), por su incidencia en la evaluación formativa, clave en el proceso de aprender a aprender (López-Pastor, 2011). Las estrategias metacognitivas, esto es, el conjunto de acciones orientadas a conocer las propias operaciones y procesos mentales (qué), saber utilizarlas (cómo) y saber readaptarlas y/o cambiarlas cuando así lo requieran las metas propuestas, constituyen la mejor base para este tipo de aprendizaje (Osses, 2007). Siendo así, la inserción del entrenamiento metacognitivo en el proceso de aprendizaje significa enseñar a los estudiantes a "planificar, supervisar y evaluar su ejecución, lo cual favorece el uso espontáneo y autónomo de las estrategias y facilita su generalización a nuevos problemas, vinculándose en esta forma la metacognición a la noción de transferencia" (Osses y Jaramillo, 2008, p. 194).

El feedback (retroalimentación que indica al estudiante cómo ha hecho una tarea) y el feedforward (retroalimentación proactiva para que el estudiante pueda realizar mejor, en el futuro, tareas similares) constituyen dos estrategias clave para el desarrollo de la metacognición y para la promoción del sentido formativo de la evaluación.

Sin embargo, para que el feedback y el feedforward sean eficaces, tienen que cumplir una serie de condiciones (Cano y Cabrera, 2013; Evans, 2012; Nicol y Macfarlane-Dick, 2006). Deben estar basados en múltiples evidencias, en tareas reales y en ambientes interactivos (Allal y López, 2005), la frecuencia y el número de devoluciones han de ser contemplados (Duijnhover, Prins y Stokking, 2012), así como que se emitan en soporte reproducible, que destaquen de forma motivada lo que haya que mejorar, pero señalando también lo bueno a mantener (Ion, Silva y Cano, 2013).

2. Elementos clave para la efectividad de la evaluación formativa: la necesaria implicación de los estudiantes

Las investigaciones sobre evaluación de competencias subrayan que ésta ha de ser flexible, comprensiva e integrada en el aprendizaje (Medina, Domínguez y Sánchez, 2013).

Dado que esta evaluación del dominio de las competencias se ha de realizar en un contexto de conocimiento reflexivo, se impone contemplar la autoevaluación como compromiso de los participantes y su toma de consciencia del proceso y las claves para el dominio de la competencia y su valoración (Trevitt, Breman y Stocks, 2012). Njora, Darmawan y Keeves (2004) evidencian que la autorregulación y la autoadaptación del proceso formativo son la base del método de evaluación comprensiva de las competencias.

Diferentes estudios insisten también en que feedback y feedforward tendrán un mayor impacto cuando sean llevados a cabo no solamente por el profesor, sino también por los estudiantes, a través de evaluación entre pares y de la autoevaluación, combinando así las

modalidades de autoevaluación y heteroevaluación (Medina, Sánchez y Pérez, 2012; Villa y Poblete, 2004). Otros autores van más allá y opinan que el aprendizaje autónomo es incompatible con un sistema de evaluación en el que no participen los estudiantes, incluso hasta en su diseño (Gil y Padilla, 2009).

Por último, no se deben ignorar las desventajas que estos procesos de evaluación pueden acarrear para el profesorado en términos de sobrecarga de tareas, especialmente con grupos numerosos (Ramos-Feijoo y Lorenzo-García, 2012).

Otro posible inconveniente son las resistencias que los modelos y sistemas tradicionales de evaluación interiorizados por el alumnado y el profesorado pueden ofrecer. En este sentido, dado que la evaluación de las competencias ha de llevarse a cabo apoyada en criterios de calidad, tanto los estudiantes, como el profesorado han de ser formados y entrenados para comprender el nuevo modelo de evaluación y participar en él de forma efectiva, construyendo e interpretando adecuadamente *feedback* y *feedforward* sostenibles, desvinculados de las calificaciones, con sentido formativo y que constituyan la base de un aprendizaje autónomo, significativo y transferible a lo largo de la vida (Strijbos, Narciss y Dunnebier, 2010). Será la forma de hacer realidad una cultura del *feedback* y del *feedforward,* en la que los estudiantes asuman, de forma habitual, la responsabilidad de ser críticos con su conocimiento, habilidades/destrezas y actitudes y de tomar decisiones en su proceso de aprendizaje.

3. Caso práctico

La experiencia de evaluación de la competencia genérica, en el caso que nos ocupa Comunicación Escrita, por pares (coevaluación), por el profesor (heteroevaluación,) y por uno mismo (autoevaluación) se inicia al comienzo del segundo semestre del curso 2018-19 en la asignatura de Matemáticas y su Didáctica del Doble Grado de Ciencias de la Actividad Física y del Deporte y Educación Primaria. El grupo está formado por 51 estudiantes y todos ellos toman parte de la experiencia.

Esta evaluación se lleva a cabo en dos momentos diferentes y coincidentes con el comienzo del semestre y con su finalización. Entre ambos momentos los estudiantes tienen la posibilidad de trabajar su competencia genérica poniendo en práctica el plan de mejora elaborado a partir del feedback y feedforward recibido.

Para la evaluación inicial, el alumnado elabora un texto de unas 300 palabras sobre un tema próximo a su interés y propuesto por el profesor. Este texto, con el fin de preservar el anonimato del autor, se identifica con un código numérico previamente establecido para cada estudiante. Cada uno de ellos evalúa y califica los textos escritos por dos compañeros, utilizando para ello una rúbrica proporcionada por el profesor. Además, debe aportar información sobre aquellos aspectos que los evaluados deberían mejorar en su competencia genérica y la forma de hacerlo. Al mismo tiempo, el profesor, utilizando la misma rúbrica, evalúa, califica e indica posibles mejoras a cada estudiante del grupo. Con toda la información recibida, el alumno elabora un Plan de Mejora que llevará a cabo durante el semestre.

Al acabar el semestre se procede a realizar la evaluación final de la competencia genérica con las mismas pautas que la inicial. Únicamente varía el último paso, en el que el alumno realiza la valoración del grado de cumplimiento del Plan de Mejora.

Al objeto de evaluar la satisfacción del alumnado con este proceso, se pasa un cuestionario con una escala de respuesta entre 1 (mínima satisfacción) y 5 (máxima satisfacción). Las preguntas se relacionan con el trabajo realizado y la metodología empleada, la evaluación en-

tre pares, la conformidad con la confidencialidad de esta evaluación y la valoración del Plan de Mejora como herramienta para el desarrollo de la competencia. El cuestionario también les pide que escriban dos aspectos positivos y dos negativos del proceso de evaluación de la competencia.

4. Conclusiones

Los resultados, con medias en torno al valor 4 y desviaciones típicas pequeñas, nos informan de una alta satisfacción por parte del alumnado con todos los aspectos sobre los que se les ha preguntado. En cuanto a los aspectos positivos cabe destacar la importancia que le atribuyen a que los pares les corrijan sus trabajos, la importancia del anonimato pues genera objetividad y la importancia del Plan de Mejora para ver la evolución de la competencia. En cuanto a los aspectos negativos, el alumnado señala la dificultad de corregir el trabajo de los pares, la imposibilidad de interactuar entre evaluadores y evaluados debido al anonimato y la necesidad de tomarse muy en serio todo el proceso.

Cabe concluir, por tanto, que la percepción de los estudiantes con el sistema de evaluación es alta. No obstante, en aras de una mayor efectividad, se ratifica la necesidad de formación previa, tanto del profesorado como del alumnado participar en los procesos de autoevaluación y evaluación de los compañeros/a.

Se desprende de los datos recogidos la pertinencia de continuar profundizando en cuestiones como la conveniencia del anonimato en la evaluación por los pares, ya que los resultados no son concluyentes en un sentido u otro.

Al finalizar el proceso en el mes de junio se podrán comparar los resultados obtenidos en la evaluación final de la competencia con los obtenidos en la evaluación inicial.

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ICCI Observatory-Empowering students on Innovation Capital

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Resumen

La práctica docente diaria en las aulas universitarias de los grados de ingeniería pone de manifiesto niveles muy bajos de capital de innovación en el alumnado. Esta falta de creatividad y capacidad para inventar o resolver problemas de la sociedad revela una serie de carencias en los estudiantes que están directamente relacionadas con su desarrollo competencial. Estas carencias suponen una importante barrera en el proceso de enseñanza-aprendizaje, además de un obstáculo añadido para cumplir con el objetivo de reducir las tasas de Dropout. Corregir esos bajos niveles de capital de innovación exige retroceder un eslabón en la trayectoria formativa del estudiante e investigar cuál es el origen de las dificultades para generar ideas o hallar respuestas a problemas concretos.

Con este objetivo, la Universidad del País Vasco (UPV/EHU) emprendió una investigación-acción sobre unos 800 alumnos ubicados en un centro educativo de gran diversidad sociocultural, analizando primeramente factores como la procedencia del alumnado, las metodologías pedagógicas utilizadas con los alumnos, la tipología del profesorado o su modelo de dirección y gestión. Se tomó el centro educativo como la unidad básica de estudio sobre la que se aplicaría un modelo teórico basado en cuatro piezas: atención individualizada, internacionalización, identidad propia del centro e innovación. Mediante este modelo teórico aplicado a un caso concreto, se procuraron hallar todas las variables que influían decisivamente en el desarrollo competencial del alumno y se buscó una fórmula que midiera su probabilidad de alcanzar un desempeño académico exitoso. La determinación de esta fórmula probabilística abre una vía para el empoderamiento del estudiante, elimina barreras existentes en el proceso de enseñanza-aprendizaje y favorece su futuro engagement en la Universidad.

Uno de los resultados de la investigación fue la propuesta de creación de un Observatorio de innovación, que se concibe como una plataforma para recoger y analizar sistemáticamente aquellos aspectos que repercutan en el desarrollo del capital de innovación en el alumnado, ofreciendo asimismo múltiples recursos destinados a todos agentes que intervienen en el proceso de enseñanza-aprendizaje y orientados a la mejora de las competencias que hoy requiere el contexto socioeconómico y laboral que nos envuelve.

Abstract

The daily teaching practice in engineering degree university classrooms reveals very low levels of innovation capital in the student body. This lack of creativity and the ability to invent or solve problems of society reveals a series of deficiencies in students that are directly related to their competency development. These deficiencies represent an important barrier in the teaching-learning process, as well as an added obstacle to fulfilling the objective of reducing dropout rates. Correcting these low levels of innovation capital requires going back a link in the student's formative trajectory and investigating the origin of the difficulties in generating ideas or finding answers to specific problems.

With this objective, the University of the Basque Country (UPV/EHU) undertook research-action on some 800 students located in an educational centre of great socio-cultural diversity, analysing factors such as the origin of the students, the pedagogical methodologies used with the students, the typology of the teaching staff or their management model. The educational centre was taken as the basic unit of study on which a theoretical model based on four pieces would be applied: individualised attention, internationalisation, the centre's own identity and innovation. By means of this theoretical model applied to a specific case, an attempt was made to find all the variables that decisively influenced the development of the student's competence and a formula was sought to measure the probability of achieving a successful academic performance. The determination of this probabilistic formula opens a way for the

empowerment of the student, eliminates existing barriers in the teaching-learning process and favours his future engagement in the University.

One of the results of the research was the proposal for the creation of an Innovation Observatory, which is conceived as a platform for systematically collecting and analysing those aspects that have an impact on the development of innovation capital in students, also offering multiple resources aimed at all agents involved in the teaching-learning process and aimed at improving the skills required today by the socio-economic and working context that surrounds us.

1. Problemática de partida. Bajo nivel de capital de innovación en el alumnado universitario

La problemática de partida se sitúa el bajo nivel de *capital de innovación* que se percibe en el alumnado a través de la práctica docente diaria en las aulas universitarias de los Grados de ingeniería. Esta problemática, que se manifiesta en una preocupante falta de creatividad y capacidad para inventar o resolver problemas que afectan a la sociedad en múltiples facetas o planos, exterioriza a su vez una serie de carencias en los estudiantes que están estrechamente relacionadas con su desarrollo competencial. El mismo ejercicio docente indica asimismo que estas carencias obstaculizan un adecuado proceso de enseñanza-aprendizaje, lo que supone una dificultad añadida para cumplir con el objetivo de reducir las tasas de Dropout, en los términos que marcan las instituciones europeas (European Commission, 2015; 2018a), así como un serio impedimento para responder a las actuales exigencias del mercado laboral. Cabe afirmar, por tanto, que la falta de capital de innovación en la población universitaria provoca efectos negativos, tanto sobre su éxito académico como sobre su empleabilidad.

1.1. Sobre el capital de innovación

En el contexto de una economía globalizada y digital, resulta fundamental que el ámbito de la educación y la formación del individuo se adapte a las profundas transformaciones que la misma impone, influyendo en la vida cotidiana de los ciudadanos y en los distintos sectores de actividad económica y social. Así, la configuración de la nueva realidad en que nos hallamos inmersos exige una adecuada integración de las nuevas tecnologías digitales con la innovación dentro de los sistemas educativos, toda vez que solamente a partir de dicha integración se podrá derivar la necesaria correspondencia entre las futuras generaciones de profesionales y un mercado laboral claramente determinado por la competitividad. En ese sentido, el marco de la economía digital deviene una de las prioridades de las políticas europeas (Comisión Europea, 2014; European Commission 2018b; 2018c), así como objeto de estudio de muchos investigadores en diversas líneas (Acs y Audretsch, 2003; Bolin, 2016; Frosio, 2017).

Conforme a lo expuesto, la Educación Superior, como fuente irremplazable de comprensión, divulgación y transferencia de nuevo conocimiento, debe ponerse a la vanguardia de esta necesaria integración entre digitalización e innovación. Y de ahí que el desarrollo del capital de innovación en el alumnado universitario se convierta hoy en una prioridad incuestionable. Un capital que se entiende como un potencial que puede transformarse en nuevas ideas que aporten un valor añadido. En este sentido, tanto el diseño de los planes de estudio de los Grados universitarios como la propia labor docente, aún con muchas dificultades, tienden a estimular la creatividad para generar tales ideas, a fortalecer aspectos como la estrategia, la planificación y la implementación de las mismas, y a incentivar el emprendizaje a fin de ponerlas en marcha. Una tendencia que se asienta sobre el convencimiento de que si los estudiantes y egresados universitarios adquieren esas habilidades y competencias por medio

de una educación adecuada, tendrán la posibilidad de ir superando los obstáculos laborales existentes y crear nuevas oportunidades para desplegar su proyecto de vida (Baumol, 2006; Tabata y Johnsrud, 2008; Heinis, Goller y Meboldt, 2016).

No obstante, el día a día en las aulas demuestra que gran parte del alumnado accede a la Universidad con una evidente falta de ese potencial innovador. Al respecto, crece la preocupación por el déficit de creatividad en los estudiantes de ingeniería, a menudo incapaces de buscar resoluciones efectivas a los problemas prácticos que el desempeño de su campo profesional demanda. El análisis de las causas de tales carencias llevó a plantear la conveniencia de retroceder un eslabón en la trayectoria formativa del estudiante para investigar cuál puede ser el origen de esos bajos niveles de capital de innovación detectados en la universidad. Se decidió entonces llevar a cabo una investigación-acción que puso el foco en los centros de educación secundaria.

2. Parámetros generales de la investigación-acción

La Universidad del País Vasco (UPV/EHU) emprendió una investigación-acción en un centro educativo concertado con una población estudiantil de unos ochocientos alumnos. Previamente se analizaron todos aquellos factores, tanto internos como externos, que determinaban las características distintivas del centro; entre ellos, su entorno socioeconómico, la procedencia cultural del alumnado, las metodologías pedagógicas utilizadas en el proceso de enseñanza-aprendizaje, su modelo de dirección y gestión, o los recursos materiales y humanos de que disponía. Todos estos factores permitieron dibujar el perfil del centro educativo, tomado como la unidad básica de estudio sobre el que se llevaría a cabo la investigación-acción.

Conforme a las condiciones previas examinadas, se diseñó y aplicó un modelo teórico basado en cuatro piezas: atención individualizada, internacionalización, identidad propia del centro e innovación. La primera pretendía lograr una implicación directa con cada alumno, conociendo de un modo exhaustivo sus capacidades, sus necesidades y su ritmo de aprendizaje, con el fin último de adaptar la labor docente y hallar el mejor modo de desarrollar sus competencias. La internacionalización surgía de la necesidad actual de adquirir notoriedad en un contexto ya indudablemente global. Se propuso la proyección exterior del centro educativo, dotándolo de un carácter internacional que distinguiera la organización del resto de las de su ámbito de actuación. Desde la pieza de identidad se trabajó el factor diferencial del centro, es decir, aquellos rasgos que lo podían singularizar y con ello adquirir ventajas competitivas. Finalmente, la pieza de innovación sirvió para buscar y articular estratégicamente nuevos elementos que aportasen un valor añadido a la organización y al mismo tiempo la impregnasen de una cultura de la innovación que llegara hasta los alumnos. Respecto a ellos, el despliegue de esta pieza se tradujo en la introducción de nuevas metodologías de aprendizaje que estimularan la creatividad, la resolución de problemas y la realización autónoma de proyectos; precisamente aquellas habilidades y competencias cuya carencia se detecta posteriormente en la universidad.

Por medio de este modelo teórico sucintamente descrito, aplicado a un caso concreto, se procuraron determinar todas las variables que influían decisivamente en el desarrollo competencial del alumno y se buscó una fórmula que midiera su probabilidad de alcanzar un desempeño académico exitoso. El establecer tal fórmula probabilística abriría una vía efectiva para la mejora del estudiante, eliminando algunos obstáculos importantes dentro del proceso de enseñanza-aprendizaje y favoreciendo su futuro engagement en la Universidad. E igualmente, podría funcionar a modo de un detector precoz de déficits relativos al capital de innovación del alumno.

3. El *ICCI* como resultado de la investigación

Uno de los frutos de la investigación-acción llevada a cabo fue la propuesta de creación del ICCI, un Observatorio de innovación que tome la forma de una plataforma que recoja y analice de un modo sistemático todos aquellos aspectos que repercuten significativamente en el desarrollo del capital de innovación en el alumnado. El ICCI está concebido como un instrumento para mejorar el paso de la educación secundaria a la Universidad, desde el convencimiento de que eliminar las discontinuidades (*gaps*) existentes entre estos dos periodos formativos supondría un fortalecimiento del *lifelong learning*. A tal efecto, este Observatorio de innovación ofrecería múltiples recursos prácticos destinados a todos agentes que intervienen del proceso de enseñanza-aprendizaje y orientados a la mejora de las competencias que hoy requiere el contexto socioeconómico y laboral que nos envuelve.

La tendencia globalizadora antes señalada hace insoslayable proponer reajustes en los modelos tradicionales de educación y formación, por cuanto nos hallamos en una sociedad del conocimiento en la que la innovación científica y tecnológica ha experimentado una aceleración formidable, los flujos de información han alcanzado una dimensión de espacio-temporal hasta ahora desconocida y prevalece la no linealidad y flexibilidad de los fenómenos sociales. Como han señalado diversos organismos europeos e internacionales (CE, OCDE, UNESCO) a través de numerosos estudios, comunicaciones e informes, estos reajustes deben tratar de abordar los diversos problemas que esta universalización del conocimiento ha provocado, tales como las dificultades para adaptar la formación a las demandas del mercado laboral, las altas tasas de abandono y fracaso, la falta de integración de una parte de la población mundial, o el evidente estancamiento de muchas instituciones educativas. A este propósito contribuiría la creación del ICCI, aportando herramientas válidas para que docentes y centros educativos se impliquen en la tarea de corregir los desajustes y déficits que se perciben en el ámbito educativo y formativo; entre los cuales se encuentra la falta de capital de innovación en el alumnado.

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Introduciendo *Flipped Classroom* en el Aprendizaje de la Formulación y Nomenclatura Química

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Resumen

Un grupo de docentes que imparten Química General en la Universidad de Jaén han desarrollado un proyecto de innovación docente basado en la metodología de *flipped classroom* para facilitar el aprendizaje activo de la Nomenclatura Química a estudiantes de distintos grados en Ciencias e Ingeniería. Se han diseñado actividades fuera y dentro del aula y se han elaborado los materiales necesarios para su implementación. El buen resultado obtenido en relación con el rendimiento, satisfacción, implicación y motivación de los estudiantes que han participado en el proyecto, lleva a pensar en la posibilidad de mantenerlo y extenderlo a otros partes de la asignatura en próximos cursos.

Abstract

A group of teachers involved in teaching of General Chemistry in different degrees of the University of Jaen have carried out a teaching innovation project based on the *Flipped-Classroom* methodology to facilitate learning of Chemical Nomenclature for students of different degrees in Sciences and Engineering. Good results have been obtained in relation to performance, implication and motivation of the students that have participated in this project, so it would be maintained and extended to other parts of the subject in future courses.

1. Introducción

El "aula inversa" (*flipped classroom*) es un modelo (o estrategia según otros autores) pedagógico en el que los elementos típicos del trabajo de los estudiantes se invierten. Se comienza por el estudio de los materiales por parte del estudiante, cuyo *feed-back* permite al docente diseñar y elaborar clases presenciales "a medida" de las necesidades formativas del estudiante.

El valor de un "aula inversa" está en la reorientación de la clase presencial hacia un espacio donde los estudiantes pueden aclarar dudas, probar sus habilidades en la aplicación del conocimiento e interactuar entre sí en actividades prácticas y colaborativas. Por otra parte, se promueve la participación de los estudiantes haciéndolos más visibles y se producen mejores interacciones entre los docentes y los estudiantes, lo que redunda en una mayor implicación y motivación en el proceso enseñanza-aprendizaje (Bergman and Sams, 2012; Bishop and Verleger, 2013; Roach, 2014; Santiago y Bergman, 2018).

Esta metodología se basa en el concepto de aprendizaje activo. En la fase de aprendizaje individual cobran especial valor los materiales audiovisuales específicamente diseñados y producidos por el docente para el tema de estudio, de modo que el estudiante dispone de una fuente adecuada y ajustada a las necesidades de aprendizaje; fuente que puede consultar

en los momentos más propicios y tantas veces como le resulte necesario. El material audiovisual es creado por el docente y concebido como un material de trabajo más en el contexto global de una asignatura de carácter presencial o semipresencial.

Un grupo de profesoras y profesores que imparten Química General en distintos grados de Ciencias e Ingeniería de la Universidad de Jaén han desarrollado un proyecto de innovación docente basado en la metodología de *flipped classroom* para facilitar el aprendizaje de la nomenclatura y formulación química a estudiantes de primer curso de esos grados.

La idea surge tras constatar que gran parte del alumnado comienza sus estudios universitarios sin el nivel competencial en lenguaje químico que se les presupone, situación agravada en algunos casos por el hecho de no haber cursado Química en sus estudios de bachillerato. Ese nivel competencial es por lo tanto muy dispar y, como su adquisición no es una competencia específica del curso, no se le puede dedicar mucho tiempo presencial de la programación. Esto hecho nos lleva a diseñar y proponer un modelo de *flipped classroom* para esta parte de la asignatura, así como a elaborar los materiales educativos que esta estrategia necesita.

2. Metodología

Las actividades desarrolladas en este proyecto y los agentes implicados en ellas se pueden esquematizar como sigue:

1. DOCENTE. Preparación de materiales (manual de estudio, colección de vídeos, lecturas, tests escritos, relación de ejercicios).
2. DOCENTE. Alojamiento en plataforma web de aprendizaje de la universidad.
3. DOCENTE. Información sobre el proyecto y adhesión de estudiantes voluntarios.
4. ESTUDIANTE. Test de competencias previas (abre acceso a los materiales de estudio).
5. ESTUDIANTE. Estudio individual de los materiales (adquisición de conocimientos y competencias + auto-detección de necesidades de aprendizaje).
6. ESTUDIANTE. Comunicación al profesorado de las necesidades de aprendizaje auto-detectadas.
7. DOCENTE. Revisión de demandas de aprendizaje de los estudiantes.
8. DOCENTE. Elaboración de estrategias y materiales "a medida" de las necesidades de los estudiantes.
9. ESTUDIANTE + DOCENTE. Clase presencial (resolución de ejemplos prácticos, revisión de dudas, trabajos colaborativos…).

Se comienza diseñando y elaborando los materiales alojados en la plataforma web de aprendizaje de la Universidad de Jaén. Resaltamos el especial cuidado puesto en la elaboración de una guía sobre nomenclatura y en la elaboración del material audiovisual. Se trata de una guía completa y actualizada diseñada para ser de utilidad también como manual de referencia en cursos superiores. En cuanto al material audiovisual, éste consta de once vídeos de entre cinco y siete minutos de duración elaborados específicamente para este proyecto. Cada uno de los vídeos producidos explica, a través de la resolución de un ejemplo, cómo se nombra y/o formula un determinado grupo o familia de compuestos químicos. La elección de estos ejemplos es importante. Se eligen de forma que, en su resolución, se necesite emplear las principales normas IUPAC aplicables a ese grupo. Ambos materiales, especialmente los vídeos, han sido muy bien valorados por los estudiantes.

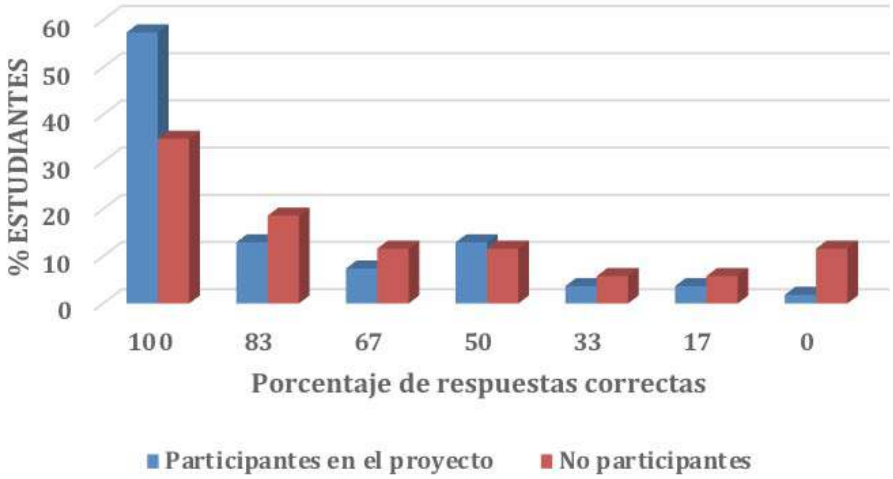
3. Resultados

De un total de doscientos cincuenta y nueve estudiantes matriculados en asignaturas de Química General en distintos Grados de Ciencias e Ingeniería impartidos en la Universidad de Jaén han participado en el proyecto un 26% (sesenta y ocho estudiantes).

Los resultados en nomenclatura se obtienen durante el examen final de la asignatura. Las preguntas se preparan de manera que para su resolución deben formular y/o nombrar un número concreto de compuestos inorgánicos y orgánicos. Su correcta expresión se corrige en un apartado específico y los resultados obtenidos son los que se muestran en la *Figura 1*.

Figura 1

Resultados del test de nomenclatura química



Centrándonos en los estudiantes con más de un 65% de fórmulas y/o nombres correctos, lo que podemos considerar aceptable para estudiantes de primer curso, los resultados que obtienen los estudiantes participantes en el proyecto, han superado en 13 puntos porcentuales al resto.

Pero más significativo es que, si comparamos los estudiantes con todos los nombres y fórmulas correctos, la diferencia porcentual se eleva a 22 puntos a favor de los participantes en el proyecto (57% frente a 35%).

Los estudiantes participantes que responden a la encuesta de satisfacción, valoran muy positivamente la experiencia. Tienen una percepción muy buena de la metodología y las actividades diseñadas. Manifiestan, a través de preguntas abiertas, que les ha servido mucho en la consecución de los objetivos globales de la asignatura porque es una parte fundamental del lenguaje empleado y en el que inicialmente no tenían el nivel deseable; es decir, les ha ayudado a adquirir la competencia con la que debían de haber iniciado sus estudios universitarios. También afirman haber conseguido una mayor motivación y una actitud más activa frente al aprendizaje de esta materia.

Figura 2
Porcentaje de estudiantes con más de un 65% de respuestas correctas

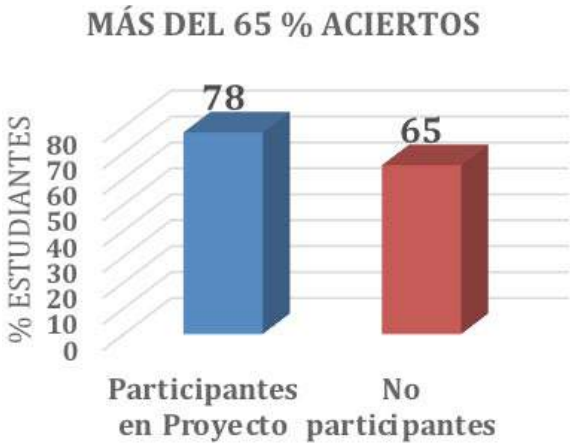
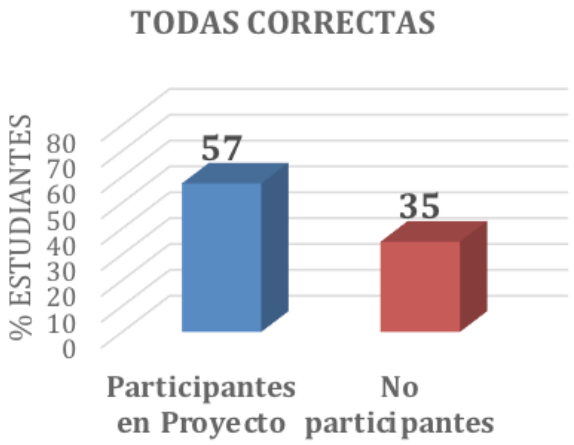


Figura 3
Porcentaje de estudiantes con todas las respuestas correctas.



4. Conclusiones

Aunque se disponen hasta la fecha de un volumen de datos limitado, dado que solo se cuenta con los resultados del primer semestre del curso actual, la experiencia ha sido exitosa porque: i) los resultados obtenidos por los participantes han sido mejores que los de los estudiantes que no han participado en el proyecto, ii) les ha ayudado a trabajar con una implicación más activa y autónoma en su proceso de aprendizaje, iii) las clases presenciales se han empleado de manera más eficaz: han cubierto de manera individual las lagunas que tras el aprendizaje autónomo pudieran tener y han favorecido el trabajo colaborativo.

Ha sido una experiencia muy bien valorada por los estudiantes, han acogido muy positivamente los materiales empleados, especialmente los vídeos, estando todos de acuerdo en que la metodología de *flipped classroom* les ha permitido un mejor aprendizaje y una mayor motivación. En cuanto a sus sugerencias, se han recogido con gran interés y serán de gran ayuda en futuros cursos así como en la posible extensión de esta metodología a otros bloques temáticos de la Química.

Agradecimientos

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Creación de nuevos contextos universitarios para el desarrollo a través del aprendizaje-servicio[1]

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Resumen

El aprendizaje-servicio aparece como una alternativa que posibilita la creación de un escenario universitario más humano y responsable con la sociedad. En esta comunicación las autoras exponen algunas experiencias de aprendizaje-servicio llevadas a cabo enla Universidad del País Vasco (UPV/EHU); más concretamente en la Facultad de Educación de Bilbao, en la Facultad de Relaciones Laborales y Trabajo Social de Vitoria-Gasteiz, y en la Facultad de Educación y Deporte de Vitoria-Gasteiz. Tras el análisis de las experiencias se puede concluir que todas ellas desarrollan competencias de los Grados y están vinculadas con diferentes agentes sociales. Además, los diversos tipos de propuestas facilitan los logros que la teoría indica. Por último, las autoras coinciden en señalar la necesidad de institucionalizar esta propuesta pedagógica.

Abstract

Service-Learning is an alternative that allows the creation of a university scene more humane and responsible with community. In this paper the authors exposed some service-learning experiences carried out at the University of the Basque Country (UPV/EHU); more specifically at the Faculty of Education located in Bilbo, at the Faculty of Industrial Relations and Social Work located in Vitoria-Gasteiz, and at the Faculty of Education and Sport located in Vitoria-Gasteiz. After the analysis of experiences, it can be concluded that all of them develop skills of grades and are linked with different social agents. In addition, proposals' types facilitate the achievements the theory suggests. Finally, the authors coincide in pointing out the need to institutionalize this pedagogical proposal.

1. Introducción

La construcción e implementación del Espacio Europeo de Educación Superior (Declaración de Bolonia, 1999) supone un cambio importante para la Universidad. Durante este proceso se distinguen dos fases. En la primera, el discurso está fundamentalmente orientado hacia aspectos organizativos; en la segunda, emerge la reivindicación de una Universidad que forme una ciudadanía responsable socialmente, crítica ante las injusticias y participativa; además de profesional (Santos, 2016).

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La transición al marco europeo ha resucitado el debate sobre la misión de la Universidad. Algunos autores recuerdan que son tres las misiones de la universidad: docencia, investigación y responsabilidad social (Santos *et al.*, 2017). Pero, ¿estas misiones deben ser entendidas de forma independiente? o, ¿es más adecuado entenderlas en interacción y complementándose? (Gezuraga, 2017).

Las autoras abogan por el segundo posicionamiento, al concebir que los contextos de aprendizaje pueden ofrecer la oportunidad de incidir en la el desarrollo cívico, ético y crítico del alumnado. E incluso consideran que estas prácticas pueden ser investigadas, en aras de mejorar determinadas realidades sociales y la calidad de la propia oferta universitaria (Bringle, Games y Malloy, 1999).

El aprendizaje-servicio aparece como una alternativa que posibilita la creación de un escenario universitario más humano, sensibilizando y responsabilizando al alumnado, además de profesionalizándolo (Aramburuzabala, Cerrillo y Tello, 2015). Esta propuesta de pedagógica innovadora integra el servicio comunitario con el currículum, vinculando a través dela-reflexión: el conocimiento disciplinar con el experiencial, con los aprendizajes que se derivan del compromiso activo en los problemas reales de la comunidad (McIlrath, 2016).

2. Objetivo

El principal objetivo de este trabajo es compartir algunas experiencias de aprendizaje-servicio llevadas a cabo en la Universidad del País Vasco (UPV/EHU). Al estar vinculadas a la comunidad se ofrecen contextos de crecimiento y aprendizaje que van más allá de las cuatro paredes del aula; donde emerge otra forma de hacer docencia, que apuesta por el bien común, favorece el aprender haciendo y reflexiona sobre lo que sé y lo que soy.

3. Experiencias

A continuación, recogemos algunos de los proyectos que vienen desarrollándose en algunas facultades de la Universidad del País Vasco (UPV/EHU). Todas estas experiencias están recogidas en el siguiente mapa interactivo desarrollado por Zerbikas: http://www.zerbikas.es/mapa-interactivo-de-aprendizaje-servicio-en-el-pais-vasco/.

Facultad de Educación de Bilbao

Dentro de esta Facultad presentamos dos líneas de trabajo que desarrolla Monike Gezuraga, profesora del Grado de Educación Social:

Vinculación curricular	Proyectos desarrollados dentro de la asignatura **"Planificación de la intervención"**	Proyectos desarrollados dentro de la asignatura **"Trabajo Fin de Grado"**
Año de inicio	2012-2013	2012-2013
Objetivos generales	—Desarrollar competencia específicas y transversales, propias de las asignaturas anteriormente citadas, a través de la colaboración con diferentes entidades para tratar de dar respuesta necesidades sociales. —Profundizar en el conocimiento sobre el Aprendizaje-Servicio (más de 20 trabajos).	
Vinculación comunitaria	Diversas entidades sociales (6), en los últimos 3 años existe colaboración sistemática con Fundación EMAUS y Fundación ZERBIKAS.	Diversas entidades y colectivos. Este curso académico se están desarrollando proyectos de colaboración con: Lantegi Batuak, Gorabide, Ongietorrierrefuxiatuak, Lagunartean y Eragintza.
Necesidad a la que se trata de dar respuesta	—Difusión de los proyectos que desarrolla una entidad social. —Identificación y difusión de proyecto de aprendizaje-servicio en Euskadi. —Actuaciones para la Economía Social y Solidaria a través de una feria del trueque.	
Valoración	Las evaluaciones realizadas con los diversos agentes implicados destacan las siguientes potencialidades: —La conexión teoría-práctica. —El hecho de que los proyectos estén relacionados con realidad sociales diferentes. —La colaboración de la Universidad con entidades sociales. —El aprendizaje significativo de los contenidos curriculares. Y como dificultades o aspectos a mejorar: —La adecuación de tiempos y espacios de encuentro. —La dificultad de los y las participantes para comprender qué es el aprendizaje-servicio. —La falta de apoyo-institucionalización por parte de la Universidad.	
Para saber más:	—http://ulertuz.org/wp-content/uploads/2015/10/Gu%C3%ADa-pr%C3%A1ctica-para-combatir-el-ruido-junio-2015.pdf —http://pdf2.hegoa.efaber.net/entry/content/1961/Comunicaciones.pdf	

Facultad de Relaciones Laborales y Trabajo Social de Vitoria-Gasteiz

En esta Facultad contamos con un el programa "***Aprendizaje Servicio EHU/UPV-IPI Sansomendi Vitoria-Gasteiz***" asociado al Grado de Trabajo Social, que coordinan las profesoras Kontxesi Berrio-Otxoa y Noemi Bergantiños:

Vinculación curricular	El proyecto no está relacionado con una asignatura determinada, se desarrolla durante los cursos 2.º y 3.er del grado
Año de inicio	2015-2016
Objetivo general	—Desarrollar competencias transversales de grado vinculadas al compromiso y la implicación social, así como competencias analítico-reflexivas, a través de la colaboración con un centro de enseñanza haciendo partícipe al alumnado universitario en el proyecto de "Comunidades de Aprendizaje". —Profundizar en el conocimiento del aprendizaje-servicio e impulsarlo, tanto como
Vinculación comunitaria	Existe una colaboración estable con la entidad IPI Sansomendi, que ha permitido la puesta en marcha del aprendizaje-servicio.
Necesidad a la que se trata de dar respuesta	—Fortalecimiento del proyecto Comunidades de Aprendizaje en IPI Sansomendi. —Difusión del aprendizaje-servicio entre el alumnado universitario. —Ampliación de contextos formativos para el alumnado universitario.
Valoración	Las evaluaciones realizadas con los diversos agentes implicados destacan las siguientes potencialidades: —La oportunidad de conocer "otras" realidades sociales —La reflexión articulada entre teoría-práctica —El acercamiento de la universidad al alumnado de secundaria —Elincidir en las expectativas de formación del alumnado de secundaria Y como dificultades o aspectos a mejorar: —La implicación y compromiso de más alumnado universitario. —El desconocimiento del aprendizaje-servicio por parte del alumnado universitario. —La falta de apoyo-institucionalización por parte de la universidad.
Para saber más:	—https://ehutb.ehu.eus/video/58c66ef6f82b2b52018b456d

Facultad de Educación y Deporte de Vitoria-Gasteiz

En el proyecto "***Transformando realidades***" coordinado por Elena López de Arana, participan las dos seccionesde la Facultad: los Grados de Educación Infantil y Primaria,y el Grado de Ciencias de la Actividad Física y el Deporte.

Nombre de la experiencia	El proyecto se desarrolla a través de los **"Trabajos Fin de Grado"**
Año de inicio	2015-2016
Objetivo general	—Desarrollar el perfil profesional (competencias específicas y transversales) del alumnado ya queconstruyen, aplican y evalúan contextos de bienestar y desarrollo para la infancia y adolescencia de nuestra comunidad. —Sensibilizar al alumnado universitario ante las injusticias sociales. —Poner en juego valores como la cooperación, inclusión y el respeto. —Construir puentes entre la Comunidad y la Universidad.
Vinculación comunitaria	Centros educativos (Ramón Bajo, Sansomendi, Ángel Ganivet y San Prudencio), la Unidad Terapéutico Educativa (UTE) de Álava, y asociaciones penitenciarias (Etxerat y Salhaketa).
Necesidad a la que se trata de dar respuesta	—Difusiónde situaciones de desigualdad social. —Intervenciónen contextos de exclusión o desigualdad intentando mejorar las oportunidades de la infancia/adolescencia.
Valoración	Las evaluaciones realizadas con los diversos agentes implicados destacan las siguientes potencialidades: —La oportunidad de conocer "otras" realidades. —El desarrollo de competencias y valores. —La reflexión basada en la relación teoría-práctica. —La construcción y mantenimiento de redes. Como dificultades o aspectos a mejorar: —La formación y compromiso del profesorado y alumnado universitario. —La necesidad de institucionalizar el aprendizaje-servicio.
Para saber más:	—http://www.zerbikas.es/aprendizaje-de-servicio-ramon-bajo-los-alumnos-de-la-escuela-de-magisterio-de-vitoria-gasteiz-llevan-a-cabo-este-proyecto-en-colaboracion-con-el-centro-educativo/ —https://www.ehu.eus/es/web/iraunkortasuna/transformando-realidades

4. Conclusiones

Se puede concluir que en todas las experiencias de aprendizaje-servicio descritas:

—Se desarrollan competencias de los Grados. En las experiencias vinculadas a asignaturas, se desarrollan competencias específicas y trasversales. La segunda experiencia, sin ubicación curricular determinada, se centra en las transversales.
—Existe vinculación con diferentes agentes sociales, lo que posibilita ampliar los contextos formativos, evitando que se limiten a los espacios y tiempos que en la universidad se ofrecen.
—Aunque las necesidades a las que se responde son diversas, se distinguen dos tipos de propuestas: de acción o intervención, y de difusión.

— Se podrían destacar las siguientes aportaciones: conocer e incidir en realidades sociales vulneradas; aprender significativamente relacionando teoría-práctica en el proceso reflexivo; la construcción y mantenimiento de redes.
— Se podrían destacar como reto principal la necesidad de institucionalizar el aprendizaje-servicio para favorecer el conocimiento, la implicación, los encuentros interinstitucionales y la reflexión conjunta.

Por tanto, las experiencias de aprendizaje-servicio presentadas, como señalan Aramburuzala y sus colegas (2015), favorecen la sensibilización, la responsabilidad y la profesionalización.

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Sustainable Development Goal (SDG) number 5: Are teachers really committed to Gender Equality and contribute to their promotion in teaching-learning process?

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Abstract

The University, as an educational entity purveyor of values, has a major role to play in the promotion of Sustainable Development Goals (SDG), and in order to do that, its staff should always take an ethical approach and be committed to certain values. Precisely, the encouragement of Goal 5, related with gender equality, requires a proactive approach on behalf of university teachers, who in many cases lack of adequate knowledge about contents, methods and specific materials, as well as training and access to experiences in the area. Consequently, the introduction of gender perspective in teaching and learning process rests on the goodwill and personal involvement of teaching staff. This paper analyses the level of such commitment among teachers of the Business Faculty of the University of the Basque Country.

1. Introduction: The Promotion of Sustainable Development Goal (SDG) Number 5 at University

Among Sustainable Development Goals (SDG) Goal 5 states that gender equality (GE) is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world. It is undeniable that one of the contexts in which inequality and the exclusion of women can and must be fought is the sphere of education. Universities, as transmitters of social awareness, should reflect the problem of gender inequality in educational processes (Fernández-Álvarez, 2014).

The introduction of the Spanish universities in the European Higher Education Area fostered several changes in the teaching-learning process that, among other things, demanded the incorporation of the principle of equality between women and men in the new Grades (Menendez, 2013). In this sense, the Spanish Organic Law 4/2007 about Universities, dated 12 April, underlines "the University role as conveyor of essential values… (in order) to achieve a tolerant and egalitarian society, where the fundamental rights and men and women equality rights and liberties are respected". In this regard, teachers in general are ideal agents to question gender inequalities and to build new models, practices and relations in equality (Aristizabal, *et al.*, 2018).

The incorporation of gender mainstreaming in university's teaching activities provides an ethical orientation in student's future professional activities and an increasing sensitivity in their gender relations and in front of existing society's discriminatory structures (Aguayo, Freire and Lamelas, 2017). Since business students collectively constitute the future leadership of corporations and small businesses, business students should be prioritized as a target group for responsible management education, so that they become responsible generators of sustainable values for business and society at large (Pomare, 2018).

In any case, despite the wide Spanish legislative framework developed since 2003 regarding the introduction of gender perspective in the Higher Education System, so far, it has not had a direct impact on the application of gender mainstreaming in university institution (Donoso-Vázquez y Velasco-Martínez, 2013; Bas-Peña, Ferre Jaén and Maurandi-López, 2017; Blázquez, 2016; Calzadilla Medina and Hernández Torres, 2018; Aguayo, Freire, Lamelas, 2017).

There are several ways to introduce the gender perspective in teaching-learning processes (Stimpson, 1998): first, through specific teaching studies about Women, Feminism and Gender (Masters and so on), second, through one course offered within a Grade, and third, through a gender mainstreaming strategy, integrating transversally its contents in any course in any Grade. In the case of the Spanish University, it is easy to find first and second type of examples, but it is more complicated to find experiences of the third type. This last alternative requires the commitment of a wide set of teachers, with the adequate training, which are engaged in a particular Grade (Bosch y Ferrer, 2012).

In this sense, the scarce knowledge about contents, methods and specific materials makes it very difficult to apply the gender perspective as the teaching staff very often lacks training and experience in the area (Menendez, 2013). Additionally, the task is challenged due to the lack of references and models, the scarce or lack of awareness in relation to gender issues, the organizational and material difficulties, and the difficulties to find experiences about the introduction of gender mainstreaming in higher education teaching (Donoso-Vázquez y Velasco-Martínez, 2013). Therefore, at the end the introduction of gender perspective in teaching and learning process depends on the goodwill, wilfulness and personal involvement of teaching staff (Donoso-Vázquez y Velasco-Martínez, 2013; Blázquez, 2016).

Hence, **the main goal of this paper is to analyse the student's perception about Business Grade teacher's commitment with the promotion of gender equality in teaching-learning processes.** This paper shows the results of an Educational Innovation Project (PIE 12, 2018-2019) funded by the UPV/EHU carried out among 428 Business Students belonging to the Faculties of Business in Bilbao.

2. Empirical Study and Results

The research was carried out among 428 students belonging to the Business Faculty of Elcano and Sarriko in Bilbao, from first, second and third year of business grade. The questionnaire was fulfilled by students on September 2018 and January 2019. The characteristics of the sample are shown below (Table 1)

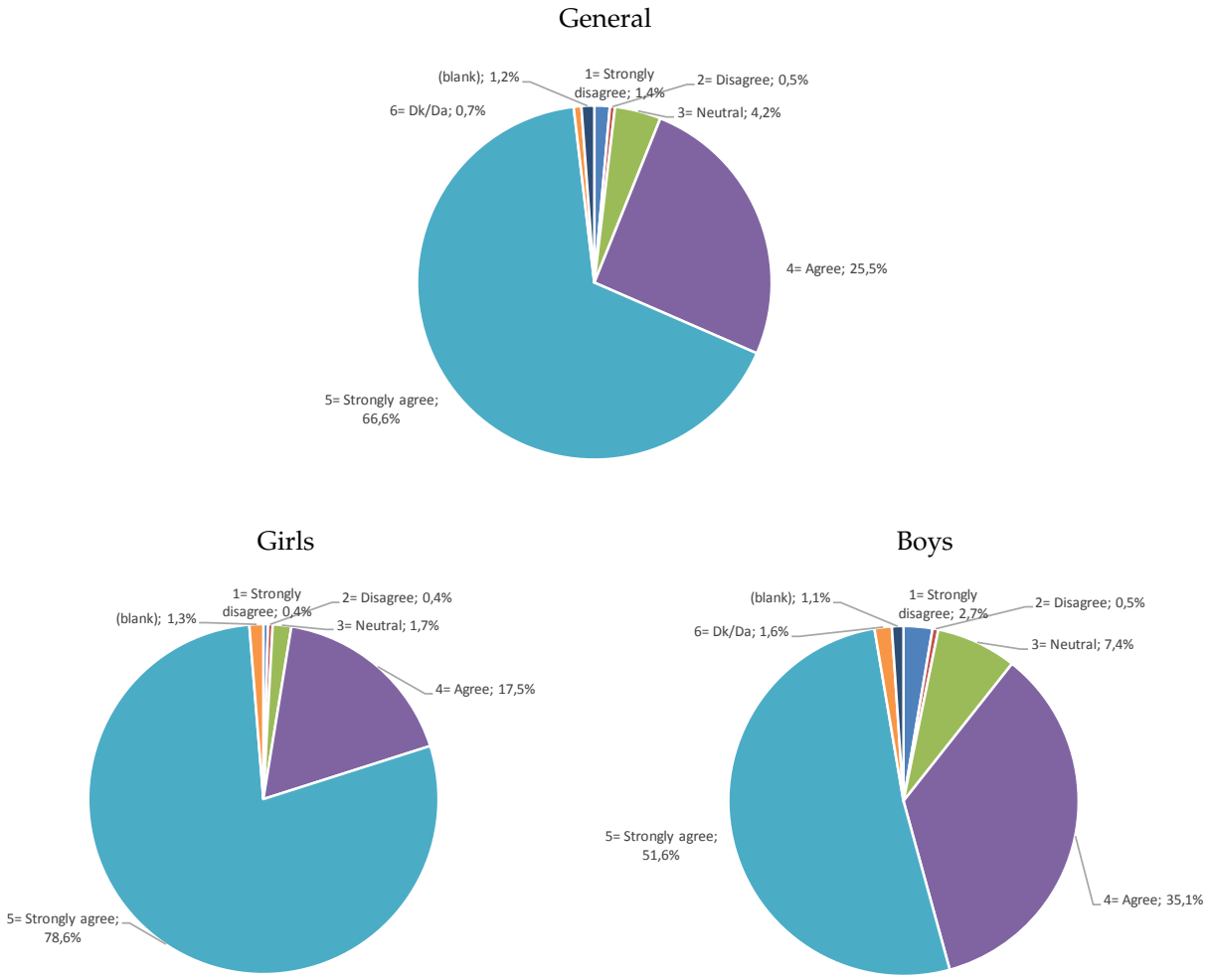
Table 1
Characterization of the sample

	Number of answers	Average Age	Years at University
Girls	188	20.7	2.4
Boys	234	20.8	2.5
Total (invalid n = 6)	422	20.7	2.5

According to the results, first of all it can be concluded that **the students consider very important that the teachers raise awareness about GE among the students**. 92,1% of students agree or strongly agree about the role the university should play in the awareness-raising on GE among undergraduates. The level of agreement is particularly high among girls (96,1% agree or strongly agree), but is also significant among boys (86,7%).

Figure 1

The level of agreement on the role the University should play in the awareness-raising on gender equality among students: general, girls and boys



In any case, when the students are asked how is the GE training received in different spheres it can be seen that **the most valuable training on GE originates from the family and the primary and secondary education system**. The university appears in a marginal position, behind even the social networks and web pages, and its only consider regular.

Table 2

Evaluation of the GE training received in different spheres

Family	4,4
Secondary Education	3,8
Elementary Education	3,6
Initial Education	3,4
Social networks, web pages, blogs	3,3
University	3,1
Voluntary readings	3,0
Newspapers	2,9
Television	2,8
Courses, workshops, symposiums..	2,7

Note: 1 = I haven't received; 2 = Inadequate; 3 = Regular; 4 = Good; 5 = Very good.

Understandably, **72,2% of the undergraduates state that the university only fulfils their expectations regarding GE training to some degree or less**, and in the case of girls it raises to 79,5%.

Table 3

To what degree does the university meet students' expectations regarding GE training

	General	Girls	Boys
Not at all	13,8%	18,8%	7,4%
To a small degree	26,2%	30,8%	20,7%
To some degree	32,2%	29,9%	35,6%
To a high degree	22,4%	16,2%	29,3%
To a very high degree	3,7%	1,3%	6,9%
(Blank)	1,6%	3,0%	

Therefore, in general the **students believe teachers are not doing enough to promote GE through teaching-learning processes**. In this respect, girls are especially discontent stating most of them that teachers are doing nothing at all (26%) or not enough (40%) in its promotion.

Table 4

Are university teachers doing enough to promote GE through teaching-learning processes?

	General	Girls	Boys
Unsure	27,8%	23,9%	31,4%
Not at all	17,3%	25,6%	7,4%
Yes, but not enough	32,9%	40,2%	24,5%
Yes, just enough	18,2%	9,4%	29,8%
Yes, more than enough	3,3%	0,0%	6,9%
(Blank)	0,5%	0,9%	0,0%

Finally, **the scarce commitment towards GE is also revealed in the use of sexist language on behalf of teachers**. In this field, girls again show more sensitivity and 55,1% agree or strongly agree that teachers do not use gender-inclusive language, while in the case of boys only a 24,5% agrees on that.

Table 5

Do you think teachers use a sexist language?

	General	Girls	Boys
Strongly disagree	7,2%	3,0%	12,8%
Disagree	10,5%	7,7%	14,4%
Neutral	32,9%	29,1%	38,8%
Agree	29,4%	38,5%	17,6%
Strongly agree	12,4%	16,7%	6,9%
Dk/Da	7,0%	4,7%	9,0%
(Blank)	0,5%	0,4%	0,5%

3. Conclusions

The research carried out allow to conclude that, according to the students opinion, UPV/EHU Business Faculty's teachers do not seem show a deep commitment in the promotions of Goal 5 of SDG. Although scholars consider very important that the teachers raise awareness about GE among the students, they feel, especially girls, that teachers are not doing enough to promote GE through teaching-learning processes, and therefore, they do not fulfil their expectations regarding GE training. As a result, the university plays a secondary

role as a source of valuable training on GE, behind the family and the primary and secondary education system.

Besides, it also can be observed that girls are particularly more sensitive and demanding regarding the promotion of GE through teaching-learning processes. This group is also more critic in the use of a gender-inclusive language among lecturers.

Taking into account the results it seems necessary to implement some actions in order to give answer to the students claims. The teachers should proactively accept their responsibility as educative agents and face the possible barriers and biases they may have.

In any case, as a further development of this study and as a way to overcome its limitations, it would be interesting to complete the research with the analysis of teacher's own opinion and commitment towards GE promotion through teaching-learning processes.

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Zabalduz

Jardunaldi, kongresu, sinposio, hitzaldi eta omenaldien argitalpenak

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