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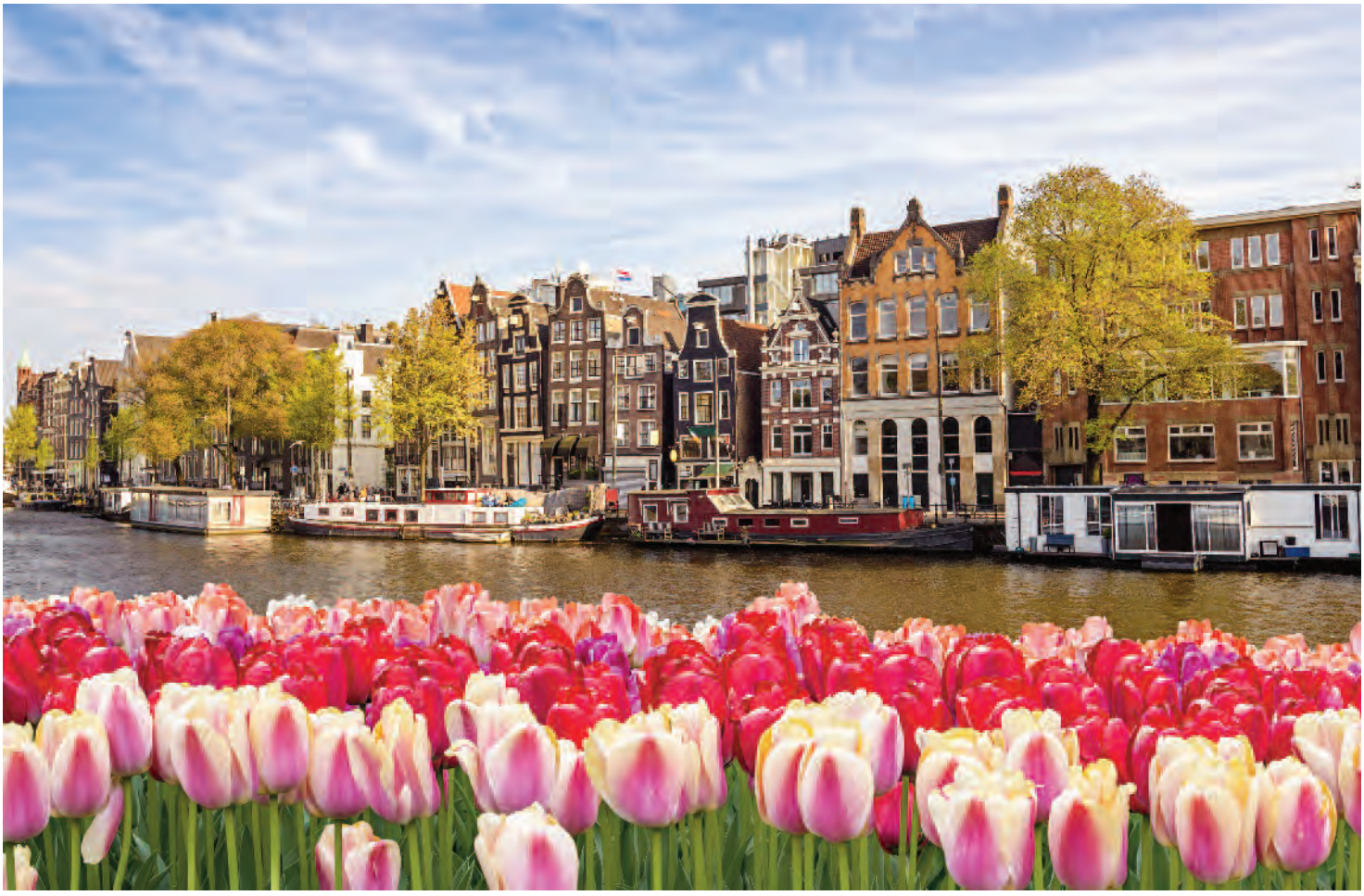

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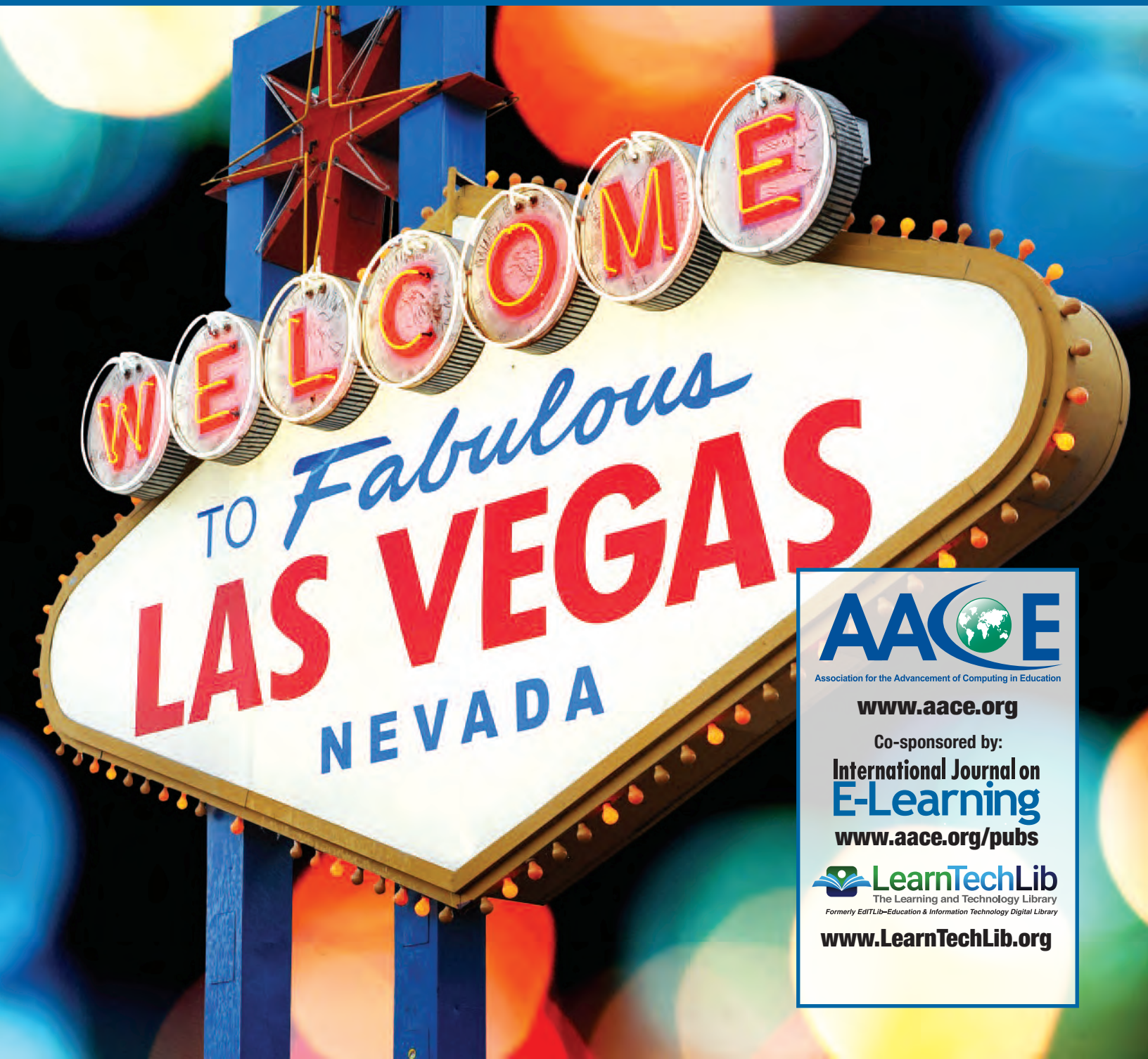

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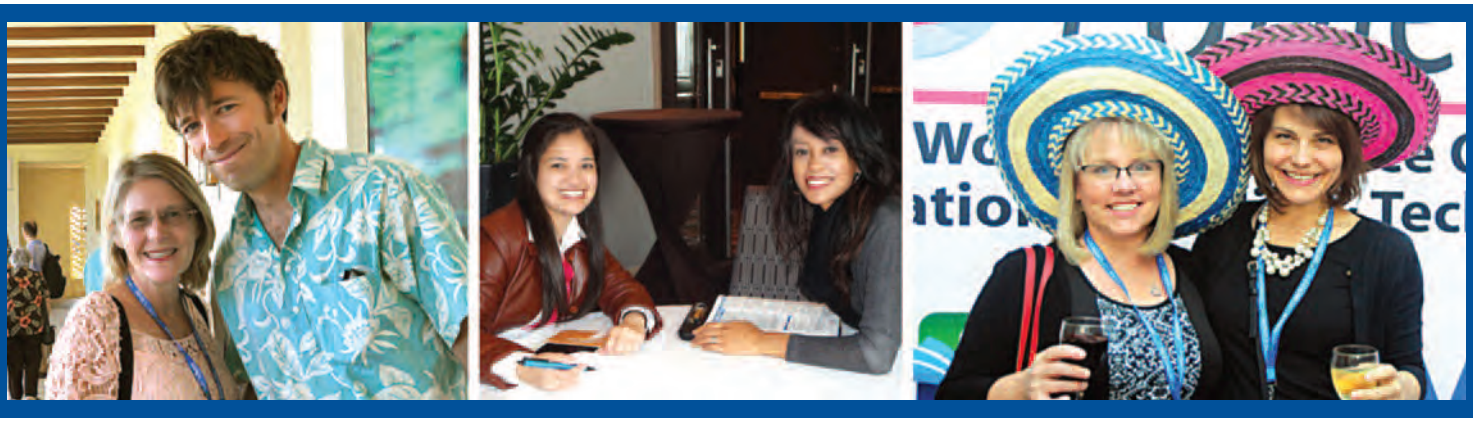

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Integration of Active Methodologies with the Reuse of Shared Online Videos

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Abstract: In this article, we present an integrated methodological approach, based on a set of proposals for teaching innovation aimed at active learning that have been separately tested and implemented in various subjects belonging to courses at different levels. Its main objective is to integrate the following elements: (1) videos generated by students and their integration into Knowledge Bases shared by the subjects involved; (2) systematic use of these videos, distributed on online platforms as a support for the *flipped classroom*; (3) peer assessment as an element of developing reflective and (self-) critical capability; (4) systematic use of collaboration with students and teachers from other universities in the development of the activities listed. The article is completed by providing specific data and the results obtained from the application of this methodology since 2013-14 in five subjects with a sample of 641 students in the Computer Science studies of three universities.

[1] Introduction

In today's society, the video, which is used in different ways in education, is a means of expression in continuous growth, especially by higher education students. In addition to being a medium of reinforcement or feedback, a support or a subject to study; the skill of expressing oneself through video is becoming a cross-curricular competence to acquire unavoidably in the field of the ICT (Information and Communication Technology) in these years.

The use of videos in education has evolved over time. A simple use is the recording or substitution of the teacher's class with the advantage that the students can attend the class when and where they want and/or see again what they do not understand (Sirkemaa & Varpelaide 2016). They have also been incorporated as a source of external information, that is, they are used for the same purpose but are not made by teachers themselves. The ability or facility to produce videos both by teachers and students in recent years has allowed them to be incorporated into the classroom via the flipped classroom methodology (Bishop & Verleger 2013, Tuna et al. 2017, Reyna et al. 2017). Before the class session, students see some videos that cause a debate or are a starting point to work in the classroom (Arya et al. 2016, Fedotova & Latun 2016, Lopes & Soares 2016). Other examples can be found such as case study, self-reflection or video-based discussion groups (Ibrahim & Alava 2014).

In parallel with the technological advances that make possible the production of good videos and their visualization at any time and any place, a more active participation of students in the learning process has been fostered. In this way, students have begun to be producers of videos also in the academic context (Green 2014).

Students demonstrate creativity and are able to generate good content that can be used for learning the subject in subsequent promotions. Taking this in mind, we propose a methodology that involves students as generators (co-creators) of content of the course through creation of videos. In the broadest sense, co-creation is a collaborative, reciprocal process through which participants, teachers and students, have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis (Bovill et al. 2016).

Among the clear advantages for students, we can point out a higher level of involvement in the teaching-learning process. Co-creation requires the development of higher order skills in Bloom's revised taxonomy (Churches 2008), since it requires a deeper level of metacognitive understanding. The teachers gain an up-to-date insight into student needs and receive new resources for use in teaching of the subject in future years (Hubbard et al. 2017).

However, our proposal does not use co-creation as an isolated element, but incorporates it along with other active learning methodologies, such as peer assessment and flipped classroom. Peer assessment also increases

motivation, helps to develop assessment skills and encourages learning based on observation of work done by colleagues (Chen et al. 2009, Gielen et al. 2011), by contrasting one's own solutions with others, either to emulate good practice or to avoid mistakes or inappropriate approaches. In our case, this peer assessment is completely separate from the subject evaluation.

Working with videos already created as reflection elements or associated with some activities is also the foundation of the flipped classroom (O'Flaherty & Phillips 2015). This reuse in later courses of the materials created is another important element of our proposal. It adds a further benefit for students with this way of collaboration, strengthening their self-confidence with their contribution to the contents of the subject for future promotions.

To carry out the methodology that we propose, a final link is to work collaboratively also among teachers and in different subjects. Everyone's experience, possible mistakes and lessons learned are important for implementing any methodological innovations. When collaboration with other universities is also possible, where there may be certain contextual changes, the experience is even more enriching (Domínguez et al. 2016).

The paper is organizes as follows: The following section details the method that combines these four methodologies: flipped classroom, peer assessment of videos, creation of videos and their reuse in later courses. As the key element of our innovative proposal is the video as learning object, this issue is addressed in the subsequent section. Next section gathers some examples of video creation and reuse in five university subjects in which our methodology has been applied recurrently in several academic years. We conclude the paper drawing some useful conclusions to start the method presented in this work.

[2] Methodology

In this methodology, we integrate some methods and techniques already tested separately in different subjects, and fit them in a global methodological proposal, in which students, during the development of the subject, move from a knowledge-receiving role generated by equals to a creator/generator role through the following five steps:

1) Students access videos generated by previous promotions and/or other universities that are part of the Knowledge Base of the subject.
2) Students assess the work done by their peers following guidelines oriented to critical self-reflection and to filtering the most useful knowledge. Depending on the case, these evaluations are contrasted with those of students from other universities, teachers or professional experts.
3) The filtered, analyzed and synthesized evaluations are returned, in sessions and through specific dynamics, to the groups of interest, as a working element that allows them to reflect on the quality and active role of professionals in the generation and dissemination of knowledge within the organizations they belong to.
4) Students, working in groups or individually and depending on the subject, become active agents of knowledge generation, becoming aware that this knowledge aspires to be useful, beyond the fulfillment of the requirements of the evaluation of the subjects, and that it will be submitted to the peer assessment process by, possibly, people from other universities and/or groups.
5) The proposals of greater social and/or academic value that emerge as a result of the contrast between students and teachers (from one or more groups and/or universities) are incorporated into the Knowledge Base, which is improved for future cycles of active learning.

[3] Videos as learning objects

According to the Bloom's Digital taxonomy (Churches 2008), video creation requires mobilizing higher order thinking skills and cognitive level, which involves understanding, planning of the filming, direction, creation, combination and cooperation. Since university students, regardless of discipline, can be considered digital natives (Akçayır et al. 2016), they should not have difficulties in producing videos. Video production allows students to express themselves in a way that makes them feel more comfortable, increasing their motivation and stimulating imaginative creations (Droumeva & Murphy 2016). However, it requires practice and experience that not everyone has, since using this technology to socialize with friends is not the same as learning, developing critical thinking or communicative skills.

According to (Chewar & Matthews 2016), in the context of computer science and engineering there are different ways to include video deliverables. For instance, like a demo to replace the presentation of a project made by students, to show the requirements of a project to be carried out, to show how to work in a laboratory or to make a guided tour of a system or presentation of work.

As a key element of our methodology is the reuse of student-generated videos, it is important to establish clear licensing criteria to avoid copyright infringement. Currently, the best option is to disseminate created videos under Creative Commons licenses and to insist on the use of images, sounds or videos from public domains as well as created under such licenses.

The same requirement is necessary for the first broadcasting. It is essential, that from the beginning students are aware that material to develop can be shown to other students as an example of good practice or counterexample, or peer assessment or discussion, consequently their previous acceptance is needed.

Since the authorship of the videos is public, in no case the proposed peer review is made anonymously. Furthermore, it must be useful to understand that, regardless of the academic evaluation, the assessment of the quality of our results is carried out continuously by others, based on expectations that are dynamically modified and in which we could try to influence, but we cannot delimit.

Additionally, a medium and long-term vision of such an information system is essential to reuse the generated material in later courses and to dispose a real, sustainable and manageable knowledge base over time. It is not possible to rely solely on the location or maintenance of the creators, because they could disappear at any given time. Therefore is required the adoption of a medium (such as a YouTube channel) and a strategy of common use of these resources among the teachers of the groups involved (Orús et al. 2016). It is also important to take into account that the number of videos to manage is growing with every course and a reflection is needed on how to manage them. Moreover, their location and nomenclature will determine their subsequent use.

[4] ## Our experience

The same methodology can be applied in different ways depending on the specific competencies of the subject in which it is applied. In our case, it has been implemented over five years at university studies related to Computer Science, in three universities of two different countries, in five subjects and involving a volume of 641 students. Under no circumstances do students receive specific training in the production or editing of videos.

In all cases the methodology has allowed to include videos in the Knowledge Base of the subject for their subsequent reuse, which otherwise would have been difficult for teachers to perform due to lack of motivation, time and, in some cases, technical and training difficulties in creating digital content. Moreover, when carried out by students, they often present terminology or formats accessible, closest and most motivating, allowing them to assimilate certain concepts more easily.

The way in which we have obtained licenses for these materials and their diffusion allows not only their reuse in the subject itself, but also in other subjects, even in other universities.

Non-reusable created videos also identify wrong assumptions about previously acquired knowledge or needs that would otherwise be more difficult for teachers to identify. Their classification and feedback received by peers or teachers help to improve understanding.

Next, we show different examples of our experiences carried out according to the different subjects involved. The main features that result from the application of our methodology in these five subjects (fifteen times in total) as well as the learning objects created by students during these processes are summarized in (Tab. 1).

Table 1: Summary of results.

SUBJECT	YEARS	N. STUDENTS	UC	FC	TYPE OF LEARNING OBJECTS CREATED	N. OF LEARNING OBJETS	PARTIALLY REUSED	INCLUDED IN KB
DBA	3	63	YES	NO	Videos	30	14	6
HCI	1	22	NO	NO	Videos	8	4	4
PM	5	135	YES	YES	LL / Videos	700 / 250	200 / 150	60 / 50
TP	3	253	YES	NO	Videos	64	18	18
WS	3	168	NO	YES	Videos / Websites	8 / 89	- / 68	4 / 5

UC: inter-university collaboration; FC: Flipped Classroom; LL: Lessons learnt;

[5] ***Example 1: Database Administration (DBA)***

In DBA, this methodology is used to work on the profile of the DB administrator. A set of videos bringing together the experience of a professional expert, along with others made by classmates from previous years from two universities including the highlights of a DBA's work from their point of view and a talk with a DBA expert about the characteristics and difficulties of their work, are source of inspiration and reflection for students to make a video with similar characteristics. Before its development, the first step is to consider and to evaluate through peer review those videos available from previous years and, after the development , the last step is to evaluate the videos

chosen the current year, among which may or may not be their own contribution. Each course, not only students and teachers evaluate the selected videos, but also professional experts with more than 20 years of experience assess them, experts who provide students with a different point of view that is important for their learning. Performing the activity simultaneously in two universities allows peer assessment between students from different centers, enriching with a competitive effect the peer review processes and the work itself (Domínguez et al. 2016).

On average, 10 videos have been produced per course over three academic years in which the methodology has been applied. Two videos from each year have been included in the Knowledge Base of the DBA subject, the six top rated and which present quite different approaches as well.

[6] ***Example 2: Human Computer Interaction (HCI)***

In HCI the pedagogical methodology is proposed through a process that is closer to the life cycle of web development. Thus, the challenge for students undergoing continuous assessment is to provide responsive capability (i.e. interfaces that can automatically adapt their structure, navigation and content to the device in use, whether it be a smartphone, tablet, laptop or desktop computer) to a web application interface. To do this, they must design that interface, validate the design by means of prototypes and evaluate the usability of the final product implemented. All this through teamwork. Each team designates one of its members as a "user" who tests the designs of the other groups, while the remaining members host the other "users" in the testing of their own prototype. Within the validation processes, and when making the digital prototype, teams develop a video tutorial either on the prototyping tool or on the functionality of their own design, in order to illustrate the advantages and disadvantages of developing a prototype.

The proposed methodology has been applied for the first time this year, and four of the eight videos generated have been selected for their inclusion in the Knowledge Base of HCI.

[7] ***Example 3: Project Management (PM)***

PM is aimed at providing tools and working methods associated with professional practice and, specifically, project management. The need for effective communications within organizations is an ongoing challenge, in particular to transfer and consolidate good practices, as well as to exploit and reuse deliverables of all kinds (documents, libraries, manuals...). For this reason, one of its teaching foundations lies in developing the critical and self-critical capability, with the aim of selecting and filtering those approaches and materials that will potentially improve the effectiveness of future work. This approach includes evaluation, selection and integration of new product developments and student-generated results into previous projects and courses.

Integration of different types of components is a typical feature of many projects in the field of software engineering; and being able to identify advantages and disadvantages of *ex novo* development versus integration and reuse is one of the competences associated with project management. In PM a progressively more complex project is developed using the spiral approach (Jaime 2et al. 016), so that in different cycles students must analyze, evaluate and select products (blog entries, videos and video channels) developed in previous cycles, either by themselves or by their peers. These products constitute a catalogue of regulated use within a promotion and, after passing a filtering process by academics, they become indicative references for successive promotions (Niño 2et al. 015).

On average, approximately 50 videos and 140 lessons learnt are developed in each promotion. At least half of the videos and more than a third of the lessons learnt are used as an a posteriori shared resource and are integrated into independently developed channels and websites.

[8] ***Example 4: Tutored Project (TP)***

In TP, students in groups of four carry out a micro project to create and to publish a video on internet, based on a specific specification. The videos are firstly evaluated by teachers from two universities on the basis of pre-established quality indicators. As a result of this evaluation process, six videos of different quality levels (high, medium and low) are selected. Next, students assess the selected videos (peer review) using the same quality indicators (Arruabarrena et al. 2017). In this case, videos are reused not only in TP, but also in three subsequent subjects with the same students of the promotion. Specifically, meanwhile in later TP courses they are reused as an example of (good/bad) practice, its real usefulness must be highlighted in the other three subjects where the experience of developing the video project is repeatedly used as a tool to illustrate basic concepts of project management and cooperative work methodologies, project concepts and teamwork.

In the three consecutive courses in which the methodology has been applied, the 18 selected videos have been preserved.

[9] ***Example 5: Web Systems (WS)***

In a subject on WS in which students develop a web application incorporating functionalities to an initial website, these functionalities are assessed through a peer evaluation following an online rubric. In this way, they identify errors in third party developments and acquire information to improve their own developments. Video creation is proposed as a complementary activity: it can identify gaps, errors or difficulties during the self-development or in any of those evaluated, and it may be used to describe students of following courses as a flipped classroom.

In this subject, it is difficult to write the functionalities or use cases that the web application must support. In the last three courses, we have chosen to generate demo videos with the functionalities to be developed. Moreover, these videos have been complemented with demos generated in previous courses by students themselves from their own developed websites. Videos show the functionality, not how the website has been implemented; therefore, it is very useful for our approach to the subject, since this is based on the development of those functionalities.

The methodology has been applied three times. Students have developed 89 new website, of which 68 have been reused in peer reviews, and the five with the highest academic value have been kept for future uses. As for videos generated, and being an optional activity for students, the volume is considerably lower, being preserved in the knowledge base of WS four videos out of the eight.

[0] ## Conclusions

The methodology presented is adaptable to several subjects and is potentially beneficial for students and teachers. After its application in various subjects, students are familiar with video creation and they participate comfortably in peer review sessions. Additionally, for these video generations, giving and receiving opinions among peers is a common practice, channeled from "likes", through comments in blogs or digital press entries, to continuous feedback in chats. Using the method presented repeatedly in subsequent applications, we have been able to carry out peer evaluations in an orderly, systematic way, without authorship conflicts, favoring the (self-) critical thinking of the participants and facilitating the selection of (good) reusable videos.

To implement this methodology the first step is the need to rely on the contributions of the students from the academics. It is crucial to create shared objectives with clear, achievable and valuable perspectives for both parties. To be precise, to transmit the idea that what is done is of interest to the one who does it and to the one who receives it. Our experience indicates that with good examples available, new contributions are improving. Students' contributions can be very valuable and different because of their direct and recent experience with the learning process.

The fear of increasing the workload of teachers when monitoring students' contributions can be an obstacle. Furthermore, students may have their misgivings about the benefits of participating as creators. One way to mitigate this reluctance is to opt for voluntary contributions or to choose specific students, as well as to propose activities that require reasonable effort on both parties and recognition. It is easier to start with small contributions from students.

As the number of reusable videos is increasing, a specific/effective organization is required to maintain, manage and retrieve the examples themselves and the information associated with them, from the technical characteristics of the videos (thematic, duration, language(s), level, license...), as data specific to their use in the teaching-learning process (peer assessment, scoring of teachers...), or knowledge management by the academics (categorization according to different taxonomies, such as technological resources used (animations, music, dubbing...) or narrative structures (example, good practices, causality...). We are starting to work with our own YouTube channels to guarantee, in a simple way, their availability. Our experience indicates that the sooner it is designed and organized the information system to meet the requirements associated with this proposal, both in terms of videos and associated information, the more satisfaction and effectiveness teachers will achieve in the use of resources generated by the students, reducing errors, junk materials and repetitions of tasks.

[1] ## References

Akçayır, M., Dündar H. & Akçayır, G. (2016). What makes you a digital native? Is it enough to be born after 1980?. *Computers in Human Behavior,* 60, 435-440.

Arruabarrena, R., Sánchez, A., Usandizaga, I. & Toribio, M. (2017). Student-generated videos as a learning tool at university studies: some experiences. *Proceedings of EDULEARN2017*, 3022-3031.

Arya, P., Christ, T. & Chiu, M. M. (2016). Video use in teacher education: a survey of teacher-educators' practices across disciplines. *Journal of Computing in Higher Education*, 28(2), 261-300.

Bishop, J. L. & Verleger, M. A. (2013). The flipped classroom: A survey of the research. In *ASEE National Conference Proceedings*, Atlanta, GA, 30 (9), 1-18.

Bovill, C., Cook-Sather, A., Felten, P., Millard, L. & Moore-Cherry, N. (2016). Addressing potential challenges in co-creating learning and teaching: overcoming resistance, navigating institutional norms and ensuring inclusivity in student–staff partnerships. *Higher Education,* 71(2), 195-208.

Chen, N. S., Wei, C.W, Wua, K. T. & Uden, L. (2009). Effects of high level prompts and peer assessment on online learners' reflection levels. *Computers & Education,* 52, 283-291.

Chewar, C. & Matthews, S. J. (2016). Lights, camera, action!: video deliverables for programming projects. *Journal of Computing Sciences in Colleges,* 31(3), 8-17.

Churches, A. (2008). Bloom's taxonomy blooms digitally. *Tech & Learning* 1, 1-6.

Domínguez, C., Jaime, A., Sánchez, A. & Heras, J. (2016). A comparative analysis of the consistency and difference among online self-, peer-, external-and instructor-assessments: The competitive effect. *Computers in Human Behavior,* 60, 112-120.

Droumeva, M. & Murphy, D. (2016). A sound pedagogy: active learning through media production. Proceedings of *8th International Conference on Education and New Learning Technologies*, 3974-3982.

Fedotova, O. & Latun, V. (2016). Flipped learning as alternative pedagogical approach to training of graduate students: advantages and disadvantages. Proceedings of *8th International Conference on Education and New Learning Technologies,* 2919-2925.

Gielen, S., Dochy, F. & Onghena, P. (2011). An inventory of peer assessment diversity. *Assessment & Evaluation in Higher Education,* 36(2), 137-155.

Greene, H. (2014). Learning through student created content videos. *International Journal of Arts & Sciences,* 7(2), 469-478.

Hubbard, K. E., Brown, R., Deans, S., García, M. P., Prun,a M. G. & Mason, M. J. (2017). Undergraduate students as co-producers in the creation of first-year practical class resources. *Higher Education Pedagogies,* 2(1), 58-78.

Ibrahim M. & Alava, S. (2014). Les images connectées: enjeux éducatifs des nouvelles pratiques médiatiques des jeunes. Culture Numérique Publications.

Jaime, A., Blanco, J. M., Domínguez, C., Sánchez, A., Heras, J. & Usandizaga, I. (2016). Spiral and project-based learning with peer assessment in a computer science project management course. *Journal of Science Education and Technology,* 25(3), 439-449.

Lopes, A.P. & Soares, F. (2016). Video lectures and online activities to engage students in a flipped classroom. Proceedings of *8th International Conference on Education and New Learning Technologies,* 8688-8695.

Niño, M., Blanco, J. M.; Jaime, A. & Usandizaga I. (2015). Collaborative learning, lessons learned sharing and knowledge management using a blog: a case study in university education with Project Management students. Proceedings of *INTED2015 Conference*: 9th *International Technology, Education and Development Conference*.

O'Flaherty, J. & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education*, 25, 85-95.

Orús, C., Barlés, M. J., Belanche, D., Casaló, L., Fraj, E. & Gurrea, R. (2016). The effects of learner-generated videos for YouTube on learning outcomes and satisfaction. *Computers & Education*, 95, 254-269.

Reyna, J., Meier, P., Mimirinis, M. & Franetovic, M. (2017). Using Learner-Generated Digital Media (LGDM) as an Assessment Tool. Proceedings *of EdMedia: World Conference on Educational Media and Technology, 898-903. Association for the Advancement of Computing in Education* (AACE).

Sirkemaa, S. & Varpelaide H. (2016) Experiences from using video in learning process. Proceedings of *8th International Conference on Education and New Learning Technologies*, 460-465.

Tuna, T., Dey, T., Subhlok, J. & Leasure, L. (2017) Video Supported Flipped Classroom. Proceedings of *EdMedia: World Conference on Educational Media and Technology*, 1159-1171. Association for the Advancement of Computing in Education (AACE).

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