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Cognitive Computing in the Classroom Using Blended Learning Strategies

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Cognitive computing is an emerging area in higher education. For this reason, it has become necessary to introduce in the university community (teachers and students) its fundamental concepts of its two supporting areas: a) artificial and natural computing, and b) neurosciences, with its advances in the last two decades. The experiences described in this communication detail the main activities that our research group is developing in an educational innovation project of the University of the Basque Country (https://www.ehu.eus/ACCE).

Our objective in this communication is to disseminate the experience carried out in three university areas (within the research group, in the context of a workshop of the international conferences REDES–INNOVAESTIC 2018, and in the computer rooms with university students from several universities) where the concept of cognitive computing in the classroom has been developed.

We have designed and implemented a set of digital resources (videos, Google forms, questionnaires, publications, interactive tools and digital platforms) to achieve this goal. These resources have been integrated in face-to-face sessions with participants as part of the blended learning modality selected for this project.

We have integrated the use of cognitive computing strategies in the classroom using a set of common resources in the three modalities of the project. In addition, each modality integrated a set of targeted resources. In three context we have used the blended modality. This involves the combination of digital resources with dialog and debate of the participants.

The experience has been carried out in three academic modalities: a) the self-training of all members of our research team (in work meetings, without a time limit and in the group's own offices or seminars), b) the training of professors participating in the congress REDES-INNOVAESTIC 2018, in a workshop format (voluntary participation with a duration of 90 minutes in a computer room), and c) the completion of a research experiment with students from faculties of education of four Spanish universities (voluntary participation by invitation of their teachers in a 15 minutes experience).

Each academic modality of the project produced a set of measurable results. In the first modality, the members of the research team, have acquired core concepts of computing

(artificial languages, primitives, symbols, manipulation of symbols, algorithms, processes, virtual machines, isomorphic problems, etc.) and basic knowledge of the brain cognitive models (System-1, System-2, heuristics, reasoning, etc.).

In the second modality, the teachers attending the workshop at REDES-INNOVAESTIC 2018 acquired basic principles about the computational framework (including Type A and Type B problems, complexity of the problems, and problem computation). They also aroused the interest to know new ways to overcome the limitations of the brain, and to capitalize on the potentialities of the human brain.

And, in the third modality, the students of several faculties of education presented good results in the use of virtual machines of isomorphic problems, and in the 'pedagogical value' of the methodology used.

This project has shown that: 1) cognitive computing in the classroom begins to take its first steps in the university community; 2) digital education offers the fundamental digital resources for the implementation of cognitive computing in the classroom; 3) the blended learning method achieves a high degree of effectiveness and motivation in the participants of workshops, seminars and experiences designed to implement cognitive computing in the classroom.