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SOME EXPERIENCES RELATED TO INNOVATION METHODOLOGIES WITHIN THE UNIVERSITY CLASSROOM

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In this second year of our Journal JOTSE our main challenge is to publish experiences related to innovation methodologies within the university classroom. Thus, allowing for the implementation and/or evaluation of competences throughout students' learning process and, especially, in the scientific and technological fields.

We understand competences as the combination of knowledge, skills and attitudes necessary to perform a task efficiently. Thereby, demonstrating abilities in action and developing them through activities that integrate all these aspects.

In the area of higher studies in the scientific and/or technological fields it is rather common that the methodologies developed have a very practical component and, in addition, they are closely linked to the professional career our students are being trained for. Particularly, in the last academic years and at the end of their studies it is when students attend more applied subjects, such as *Projects* in the case of Engineering Studies that together with the *Degree's Final Project* (PFC) allow to integrate a wide range of generic or cross-curricular competences and specific ones within the field. These types of subjects have shown to be very efficient to make students become closer to the professional reality that they will face at the end of their studies and where they will have to provide a solution for problematic situations or to meet the needs nowadays society demands. (Dochy, Segers, Van den Bossche & Gijbels, 2003; Prince, 2004; Prince & Felder, 2006).

Furthermore, with the incorporation to Bologna process, targeting a more active role of students during their learning process, it is even more relevant that students face real problems from the very beginning of their studies so that they gradually acquire generic competences, which are vital for their training both as individuals and as professionals in our present society. It is within this context that Problem-Based Learning (PBL) has proved its usefulness to reach such an objective. In this sense, several authors have shown that PBL can be successfully implemented in Engineering studies and as early as in the first year (Del Canto et al., 2011) by integrating teamwork among other competences.

In this issue of JOTSE we are including an example of getting the working world closer to University as in the case of Pomona, California State Polytechnic University that while aiming at promoting STEM (Science, Technology, Engineering, and Mathematics) education, a group of students of Aerospace Engineering participated in the NASA's SEED (Systems Engineering Educational Discovery) in a reduced gravity program with NASA (National Aeronautics and Space Administration). Through this experience, the team worked with a NASA Principal Investigator on a project to build and fly a prototype test article to demonstrate emergency atmospheric reentry with control in one axis. Through this experience, the team was able to gain hands-on experience with spacecraft instrumentation and learn valuable lessons in teamwork and systems engineering that can be applied to real-world situations.

FLIGHT MECHANICS EXPERIMENT ONBOARD NASA'S ZERO GRAVITY AIRCRAFT by Matthews, Motiwala, Edberg and García-Llama.

The second article it is a good example of a Higher Education Centre in Spain specialising in Technical and Business training, Florida Universitaria (Valencia), where they developed projects and integrated them throughout the whole degree in which the varied subjects from each academic year contribute to a part of such project. They use a methodology that enhances the development of skills and abilities as well as collaborative learning. This methodology is student-oriented, as students must search for knowledge themselves, thus connecting the educational and the real world at the same time.

THE INTEGRATED PROJECT AS A LEARNING EXPERIENCE by Antequera and Herrero.

The third article shows an example where students from the first year of Building Engineering studies of the Universidad de Sevilla develop a project whose main aim is to integrate the generic competence of creativity during the process of making the academic year final project.

The Project consists in developing a very short video with subject-related content to motivate the development of creativity among students, and which would allow them to understand their own strengths and weaknesses in this area. As previously mentioned, it was also designed to achieve certain cross-curricular competences included within the learning objectives of the subject, such as the ability to communicate through words and images? in the context of a project developed through teamwork.

DEVELOPMENT AND ASSESSMENT OF GENERIC COMPETENCES IN ENGINEERING DEGREES THROUGH CREATIVITY by Anguís.

Many Spanish university institutions face a problematic situation at the beginning of each academic year in the Engineering Studies when the profile of students attending lessons is rather heterogeneous in terms of basic knowledge of core content, such as Mathematics and Physics subjects. In this sense, a Project called EnginyCat has been developed to make groups more homogeneous and to help first year students obtain better academic results.

In the fourth article of this JOTSE issue we can learn about the application of EnginyCat project (http://www.gencat.cat/economia/ur/ambits/universitats/enginycat/index.html) so as to improve Physics knowledge among students starting their bachelor's in Engineering at the school associated with the Technical University of Catalonia, Universitat Politècnica de Catalunya (UPC, Barcelona, Spain, http://www.upc.edu/) during the academic year 2010-2011. In addition, this type of initiative encourages senior students to become mentors, thus, providing them with leadership and team management skills, which are and will be very useful for their professional careers.

A NEW LEARNING EXPERIENCE: VOLUNTARY PREPARATORY COURSE FOR THE BACHELOR'S DEGREE IN ENGINEERING by Botey and Alcaraz.

On the other hand, it is known that assessment is key in the learning process as the set of activities (summative and formative) that are carried out during a subject cannot be considered as isolated assignments or cannot be separated from the methodology (Boud & Associates, 2010). In the present issue of JOTSE we have included two examples of assessment activities that enhance continuous learning during the Engineering studies at Spanish universities.

The first article deals with the integrated use of online quizzes as a teaching and assessment tool in the general program of the subject *Proyectos* at the Escuela Politécnica Superior, from the Universidad de Córdoba. The subject aims to strengthen student abilities in: organizing and planning; analysis and synthesis; applying knowledge in practice; troubleshooting; decision-making; oral and written communication in a professional context; adapting to new situations; and managing technical information. It is expected that upon completing this subject, students will be able to organize the process for carrying out engineering projects, from managing technical documentation to implementing of solutions. The main purpose of online quizzes in Moodle is to encourage students to study regularly, and at a pace that it is consistent with course requirements.

ANALYSIS OF ONLINE QUIZZES AS A TEACHING AND ASSESSMENT TOOL by Salas-Morera, Arauzo-Azofra and García-Hernández.

The article "Analysis of Students' Generated Questions in Laboratory Learning Environments" closes this second volume of JOTSE. The aim of this research is to design and apply an alternative and qualitative assessment tool to characterize them in an introductory course of organic Chemistry in the 1st course of the Technical Superior School of Rural Environments and Enology, at the Universidad Politécnica de Valencia. For this goal, the spontaneous students' generated questions have been chosen as a reliable source of information. To process it, a methodology based on the Grounded Theory has been developed. And this provides a framework to characterize LLEs (Laboratory Learning Environments), which has been applied in two case studies.

ANALYSIS OF STUDENTS' GENERATED QUESTIONS IN LABORATORY LEARNING ENVIRONMENTS by Llorens-Molina, Llorens de Jaime and Sanz Berzosa.

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