Guest Editorial

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I am very glad that this first issue of iJEP, the International Journal of Engineering Pedagogy, covers selected papers from the IGIP Special Track Session *New Pedagogic Challenges in Engineering Education,* within EDUCON2011, the IEEE Second Global Engineering Education Conference. The topic of the conference was "Learning Environments and Ecosystems in Engineering Education". This special track aimed to foster the discussion by providing a forum for sharing approaches, developments and experiences in line with the mission of the International Society of Engineering Education (IGIP).

The proposed topics in *New Pedagogic Challenges in Engineering Education* were concerned not only with good practices in engineering education (EE) and with the constant demand on the use of technology but also with the effectiveness of fundamental knowledge in order to guaranty simultaneously the spirit of engineering leadership in society and the lifelong learning capability.

The future of learning will rely strongly on the use of ICT which is therefore present in many of the proposed topics. But they are also directed to the perspective of EE oriented for K-12 teachers and students as well as at postgraduate level and for Engineering Educators.

This issue covers a diversified set of contributions which will be briefly summarized.

The work entitled "Learning Styles in Foreign Language Teaching/Learning" is based in intermediate outcomes of a three-year project: a flexible model of the ICT supported educational process reflecting individual learning styles, applied in foreign language learning/teaching processes. Questionnaires were used for defining the individual learning style. The work presents results and their discussion.

The second paper, "Using VISIR in a large undergraduate course: Preliminary assessment results", presents some preliminary results concerning the use of a remote laboratory, known as VISIR, in a large undergraduate course on Applied Physics, with over 550 enrolled students. Its main contribution is to disseminate real data about the pedagogical effectiveness of remote labs.

The third work named "Research Skills Enhancement in Future Mechanical Engineers", reports on a project based learning methodology used with students in a course dealing with ceramic and composite materials in the integrated master in mechanical engineering. In the very beginning students are engaged with a set of recent scientific articles. Once a specific article is selected by a group of two students they have to study it deeply, using the available tools, elaborate a scientific report, prepare a presentation and participate in a debate. Results collected in the last 5 years show the benefits of the methodology.

The paper number four entitled "Maxima – An Open Alternative for Engineering Education", presents a contribution for fostering an interactive teaching approach in Control Theory. The main objective is to offer entirely open software and Maxima has been the selected software environment. Some examples are presented. An interesting feature is that the applications are developed by students in their individual projects. Based in the "learning by doing" process and in their natural satisfaction by programming they learn Control Theory.

The fifth work "Remote Experiments and Online Games: how to merge them?" discusses the guidelines for integration of game-based learning and remote experiments. The emphasis is placed on educational game design as a positive impact on learning and on players' attitude. The concepts of integration of the remote experimentation and the game setting are yet to be developed.

The paper number six "Interdisciplinary Approach in Engineering Education", points out the relevance of interdisciplinary approach in engineering education to develop in future engineers the necessary skills to make them competitive professionals. Experiments were oriented for the use of foreign language integrated in everyday classes as

well as for the integration of commercial software packages as working tools within other subjects, increasing computer literacy. Results of the positive experiments carried out are presented and discussed.

The seventh paper, "Experimental, Numerical and Virtual Tools in Civil Engineering" describes experimental and virtual setups developed for improving the perception of important concepts in structural and soil mechanics, with particular emphasis on groundwater flow phenomena. These developments were carried out by multidisciplinary teams of teachers and students from the Departments of Civil, Mechanical and Informatics at FEUP and proved to be an added value for students and for the teachers too.

The work number eight is entitled "Experiment@Portugal" and reports a special ongoing project in Portugal. Its main goal is to survey and organize the remote and virtual labs and make all of them available in a platform integrating a database, for increasing the sharing capabilities at national level. The project also aims to provide resources to K-12 students and teachers, to the industry and to be used as a dissemination tool for experimental activities.

The last work, named "An early start in Robotics – K-12 case-study", describes a study carried out with K-12 students to understand their motivation in the use of robots within the curricular unit named Project Area. A group of K-12 students participated in a RoboParty® event, where, in a simple and entertaining way and supported by qualified tutors, they learned how to build a robot. A questionnaire was applied to identify and evaluate the K-12 students' opinions regarding the experience.

At last, a word has to be addressed to reviewers, Michael E. Auer, Luís Gomes, Liliane S. Machado, Rónei Marcos de Moraes, José Couto Marques, Andreas Pester, Juarez Bento da Silva, James Uhomoibhi, Katarina Zakova, Danilo Garbi Zutin and Susan Zvacek, by their contribution for the guarantee of content quality.

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