Editorial Vol 7, No 4

EDUCON 2017 Highlights by iJEP

https://doi.org/10.3991/ijep.v7i4.7719

The theme of IEEE Global Engineering Education Conference EDUCON 2017 was "Challenging the Transition from the Classic to the Emerging in the Engineering Education". The event was held in Athens, Greece April 26-28, 2017 (http://www.educon-conference.org/educon2017/index.php). EDUCON 2017 was the eighth in a series of very successful conferences that rotate among central locations in IEEE Region 8 (Europe, Middle East and North Africa). EDUCON 2017 was organized by the University of Piraeus, the Hellenic Open University, the Hellenic Air Force Academy, the Technological Educational Institute of Athens, and the Piraeus University of Applied Sciences, Greece.

The program committee and the reviewers had to review 770 papers. Finally 292 papers were presented in 48 parallel sessions. The papers were divided into sessions with full papers, short papers and works in progress. Since, traditionally, EDUCON is especially directed to close the gap between pure academic research and applications as well as to experiences in the daily educational processes, several special sessions organized by prominent researchers and educators discussed emerging fields in Engineering Education, such as:

- Games Engineering
- IT and Engineering Pedagogy
- Technical Didactics Software Engineering
- Motivating Students with Mobiles
- Teaching Information and Network Security
- Computational Thinking and Computing Education
- Conceptual Modelling

The conference was preceded by a day of workshops and tutorials. The 3rd OMiLab Workshop: Teaching Conceptual Modelling focused on how conceptual modelling can be applied and used in various educational environments, while the workshop on how to Improve the Quality of Open Education and MOOCs gave the attendants the opportunity to work in an interactive environment with the tools provided by the European Analysis for the Quality of MOOCs.

The tutorial in learning analytics in education provided an introduction to the emerging field of Teaching and Learning Analytics from the perspective of a classroom teacher. Starting from the current global trend of using Educational Data to take Data-Driven Evidence-Based Decisions at various levels (school self-evaluation and improvement, curriculum and policies revisions) and from various stakeholders (teachers, school leaders, curriculum leaders, policy makers), the tutorial focused on the classroom teacher to guide her/him through the use of Educational Data Analytics for improving classroom-based teaching and learning.

The workshop "Have You Ever Wondered Why? Qualitative Research Methods to Investigate Engineering Education" engaged participants in how to apply multiple qualitative research methods to examine emerging issues in engineering education. The focus was on using qualitative methods—grounded theory, thematic analysis, and content analysis—across multiple data collection methods (individual interviews, focus groups, key informant interviews, and policy/programmatic artifacts) and across several institutions.

Four keynote speeches were given during the conference on a variety of current topics regarding Engineering Education.

Dr. Dragan Gašević, Professor and Chair in Learning Analytics and Informatics, Moray House School of Education and School of Informatics, The University of Edinburgh, United Kingdom, opened the conference with a speech on "Using Learning Analytics to Inform Research and Practice". After introducing the field of learning analytics and the presentation of some well-known case studies, he proceeded with the identification of critical challenges that require immediate attention in order for learning analytics to make a sustainable impact on learning and teaching practice. In particular, he set several milestones selected as critical for the maturation of the field of learning analytics.

The talk by Martin Dougiamas, founder and CEO of Moodle Pty Ltd, Perth, Western Australia, presented the Moodle Platform, focusing on its openness for Research and Development of Online Learning. Specifically, he proclaimed his vision for an open, cooperative online learning where everyone can contribute and participate without any strings attached.

Tiia Rüütmann, Associate Professor and Head of Estonian Centre of Engineering Pedagogy at the Institute of Mechanical and Industrial Engineering at Tallinn University of Technology (TUT), Estonia, presented the "IGIP Philosophy - Effective Basis for Contemporary STEM Teaching and Learning". After describing the basic principles of the Klagenfurt School of Engineering Pedagogy, that have served as the basis of the philosophy of International Society of Engineering Pedagogy (IGIP) since its foundation in 1972, she continued on showing applications of this philosophy and how the IGIP philosophy can serve as an effective basis for contemporary STEM teaching and learning, taking account of today's students' differences.

Dr. Kinshuk, Dean of the College of Information at the University of North Texas, USA, talked about "Enhancing Learning through Adaptivity and Personalization in Ubiquitous Environments". In particular, he focused on how student experiences produce data in various environments and how through access to these big, continuous, and disparate data-sets, learning experiences can be characterized based on quality of the content, personalized assessments, learners' comprehension, topic associations made by learners, learners' feelings/emotive states, learners' insights, learners' assumptions in discussions, effectiveness of peer networks, instructional capacity, learner challenges, learners' confidence, learners' recognition of new skills, and learners' refinement of gained competencies. In particular, his talk emphasized how learning can be made smart by using adaptivity and personalization approaches to provide individualized instruction.

With this issue, the iJEP Journal likes to take the opportunity to present a selection of the engineering education related research and best practices that were presented at EDUCON 2017. Authors whose papers could be of great interest for the readers of the iJEP Journal were invited to submit an extended and/or updated version of their work.

The paper 'Programming Basics for Beginners' by Olga Mironova et al. describes a successful teaching approach in programming basics for novices: schoolchildren of different ages and schoolteachers. This programming course was developed at the Institute of Informatics of Tallinn University of Technology in Tallinn, Estonia.

John Kanelopoulos et al. present with 'Flipping the classroom to increase students' engagement and interaction in a mechanical engineering course on Machine Design' their research at the School of Pedagogical and Technological Education, Athens, Greece. The paper provides a case study proposing wikis as an important technology.

'Developing a Test for Assessing Incoming Students' Cognitive Competences' is the focus of the paper by Veronika Thurner et al. from the Munich University of Applied Sciences, Germany. Their paper describes the development of a test that assesses first-year students' initial cognitive competences as well as basic knowledge in maths and computer usage.

Nikolaos C. Zygouris et al. contribute 'A neuropsychological approach of developmental dyscalculia and a screening test via a web application' from the University of Thessaly, Lamia, Greece. Their research aims at constructing a battery of six tests that can be delivered by computer in order to screen children's arithmetic and cognitive skills. The results are discussed in relation to the use of computers as screening tools for children with learning disabilities.

'A Blended Learning Module in Statistics for Computer Science and Engineering Students Revisited' is presented by Christina Andersson et al. from Frankfurt University of Applied Sciences, Germany. This paper describes the introduction of a blended learning module in statistics. Furthermore, the first experimental in-class usage, including evaluation of the students' expectations, has been completed and the outcome is discussed.

Jorge Rodriguez et al. investigate the 'Motivation of Engineering Students Participating in Multinational Design Projects'. Their work compares the motivation of students before and after participating in a multinational design project, using gender and class standing as differentiating parameters. Three motivation constructs are discussed: interest/ enjoyment, perception of choice, and perceived competence.

The lively discussions during the sessions as well during the social functions of the conference covered all the new trends in engineering education as well as traditional issues educators and researchers have been facing for many years. Learning analytics, game-based learning and quality in engineering education were the topics that got the lion's share in these discussions. EDUCON 2017 really represents a significant milestone in the history of engineering education!

Michael E. Auer
Carinthia Tech Institute, Austria

Christos Douligeris
University of Piraeus, Greece

Matthias C. Utesch
Technical University Munich, Germany

José Couto Marques
University of Porto, Portugal