Editors: P. Dondon, O. Martin

Latest Trends on Engineering Education

- 7th WSEAS International Conference on Engineering Education (EDUCATION '10)
- International Conference on Education and Educational Technologies

Corfu Island, Greece, July 22-24, 2010

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Preface

This year the 7th WSEAS International Conference on ENGINEERING EDUCATION (EDUCATION '10) and the International Conference on Education and Educational Technologies were held on Corfu Island, Greece, July 22-24, 2010. The conferences remain faithful to their original idea of providing a platform to discuss basic science in engineering education, changes and challenges in engineering education, organization of laboratories, management of educational institutes, relations between lecturers and students, examinations and tests via internet, advanced educational software and hardware, curriculum design and development, digital libraries and education, distance learning and distance teaching, educational software and applications, human-computer interfaces, online scientific labs, post-university education and training, psychology of minorities in education, research on advanced technology in education, security aspects in education, standards in learning and teaching, ubiquitous learning, virtual reality and modern education etc. with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Human Resource Management in Higher Education

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Faculty of Technological Engineering
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Abstract: University establishes plans and actions to identify the necessary resources, so the policy of the institution concerning the quality can be applied so that the processes developed within university to be more efficient.

Brief Biography of the Speaker:
Badea Lepadatescu is currently an Associate Professor at the Faculty of Manufacturing Engineering of the Transilvania University of Brasov, Romania. He obtained his doctoral degree in 1998 in the area of machining through superfinishing process. After he gratueted he worked five years as design engineer at Roman truck factory in the field of manufacturing processes and designed many devices and special machine tools especially for superfinishing process. Started on 1982 he worked as research engineer at Transilvania University of Brasov, and after 1997 he is teaching at faculty of Manufacturing Engineering department. His main academic interests include Tolerance and Dimensional Control, Manufacturing Engineering Processes, Automation Processes, and Renewable Energy Sources. The research accomplishments are reflected through publications in a five books and authored or co-authored over 120 papers published at international conferences. He has extensive experience in both experimental and theoretical research work having more than 50 contracts with factories to design and produce machine tools for machining processes. Also in the field of Renewable Energy Sources together with a team he made two wind turbines, one with horizontal axis for taking water, and one with vertical axis to produce electric energy. He has been speaker to international conferences, has moderated forums, organized symposia, workshops and sessions at major international conferences.

Plenary Lecture 2

Digital Culture Impact on Education

Professor Ioana Moisil
Department of Computer Science and Automatic Control
"Hermann Oberth" Faculty of Engineering
"Lucian Blaga" University of Sibiu
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Abstract: We are living in a world dominated by technology. And among all technologies, information technology is the one that has a direct and constant influence on our lives. Our society is evolving around information technology, it is a "information society", and we are witnessing the emergence of a new culture – the digital culture. This new culture is our reality but also a "field of study that seeks to explore the cultural ramifications of digital technology, and how the alterations in the patterns of communication, information processing, and archiving resulting from the use of digital technology have influenced human behaviour". In this lecture I will first discuss the different faces of digital culture, from e-mails, chats and blogs to digital art and social networks. Secondly, I will try to enlighten the impact of the digital revolution on education, with special references to engineering education. My argument will be based on several case studies, especially concerning the life-style profile of today students and their learning behaviour.

Brief Biography of the Speaker:
Ioana Moisil received the M.Sc. in Mathematics at the University of Bucharest, in 1971, the scientific grade in Statistical, Epidemiological and Operation Research Methods Applied in Public Health and Medicine at the Universite Libre de Bruxelles, in Belgium, in 1991 and the Ph.D. in Mathematics at the Romanian Academy in 1997. Work places: the National Institute for Research & Development in Informatics - I.C.I (1971-1986), Carol Davila Faculty of Medicine Bucharest – department of Biophysics, CCSSDM Center of the Ministry of Health. At present she is a full-time Professor and a Senior Researcher at the Department of Computer Science and Automatic Control – Faculty of Engineering at the "Lucian Blaga" University of Sibiu. She is the author/co-author of fourteen books and over 150 scientific papers. Her scientific interests include intelligent systems, healthcare telematics, web technologies, data-mining, e-learning, modelling and simulation, uncertainty management, human-computer interaction. Professor Moisil participated in several EU funded projects as project manager for the national partner (Telenurse ID ENTITY, MGT, PROPRACTITION, PRO-ACCESS), in Tempus projects and in national funded projects as research manager and software development coordinator (INFOSOC – eUNIV, AMTRANS – eCASTOR, INFOSOC - e-Scribe, INFOSOC – DANTE, e-EDU-Quality, eTransMobility, CNCSIS 2007-code 33, Studies on multivariate interpolation, polinomial classifiers and applications, CNCSIS 2007 – cod 1502, Aspects concerning the psycho-cognitive abilities of artificial intelligent agents and applications in ITC based education). Ioana Moisil is a member of EARLI (European Association for Research in Learning and Instruction), she is Romanian representative in the IMIA SIG and EFMI WG5 Nursing Informatics, honorary member of the Bohemian Medical Association J.E.Purkyne of Bio-engineering and Medical Informatics, member of the ISCB – International Society for Clinical Biostatistics, a member of the National society of Medical Engineering and biological Technology, of the Romanian General Association of Engineers, member of the IITM- International Institute of Tele-Medicine and of the Romanian Society of Mathematics Sciences. She is vice-president of the Romanian Medical Informatics Society; vice-president of the HIT Foundation for Health Informatics and Telematics and a member of RoCHI-ACM. Professor Moisil is taking part in several international peer-review committees and conferences scientific boards.

Plenary Lecture 3

Particularities of the Maritime Higher Education System as Part of the Maritime Transport Engineering Studies

Professor Eugen Barsan
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Abstract: The higher education in the maritime field is a particular domain of the engineering education. The main characteristics are given by the existence of an international standard imposed by the International Maritime Organization (IMO) that is compulsory for all maritime universities combined with the national engineering curricula, that is also compulsory in accordance with the national standards. More than that, the maritime students must undertake a 6 to 12 month obligatory practical training on board ships. Starting from 2009, Constantza Maritime University has developed a project financed with European funds that aims for an increase in the quality of training and the practical skills of the students that will be working in the maritime industry, by organizing and undergoing on board training stages at higher standards. It is expected that once this objective is achieved, there will be a 40% increase in the chances of employment in the shipping companies for the Romanian students. A coherent, modern application of such a program with fully integrated on board training sessions, would ensure a better chance of employment for our students in the European fleet. If the "equality of chances" principle is considered, the increase of theoretical knowledge by acquiring specific practical skills for those students that undergo MARCON, for graduates of female gender an increase of up to 60% in their employment chances is expected as maritime officers on board maritime ships. The main purpose of our paper is to share with the academic community the findings related with the integration of this kind of practical training in the general engineering curricula.

Brief Biography of the Speaker:
Dr. Eugen BARSAN graduate Naval Academy in Constantza, Romania in 1982. From 1982 to 1991 he sailed as deck officer in the Romanian merchant fleet, on different types of maritime ships. From 1991 his activities were related with the maritime education and training, teaching different nautical sciences at Constanza Maritime University. He completed is PhD in Surface Transport in 2004 defending his Doctoral thesis on “Oil Spill Prevention and Response along the Romanian Coastline" at Bucharest Technical University. In the last 18 years was appointed as Head of the Nautical Department, Vice Dean of the Maritime Transport Faculty of Constantza Maritime University. Now he is the Vice Rector for research and international cooperation at Constantza Maritime University. Dr. Barsan's primary areas of interest are: radar navigation, navigation and ship handling simulation, maritime safety and security, waterborne transport. Many of his research projects deal with optimization of maritime transport, analysis of human errors in navigation and ship handling, maritime traffic safety and control, man-machine interface in waterborne transport. He is member of the International Association of Maritime Universities (IAMU) and of the International Maritime simulation Forum (IMSF). Acting also as Director of the Constantza Maritime University Simulation Center, he is managing the development of the maritime simulation facilities and supervising the research activities that are applying simulations and on site experiments.

Plenary Lecture 4

Powerful Learning Environments in Engineering Education: Teaching and Learning Practices

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Abstract: The role of ICT and design of learning environments which integrate virtual learning environments in higher education is investigated. In design and development of an effective and adaptable learning environment, educational technology and information communication technology have an important role. Powerful virtual learning environments are assisting complex tasks, providing authentic contexts for active and self-directed learning and collaboration, assisting the needs of individual students. The implementation of new educational technologies based on web 2.0 is becoming a focal point of higher education institutions. However there is little comparative analysis in the field. The paper is outlining, based on the comparative analyse, teaching and learning approaches and its impacts on problem solving, team work, interpersonal skills, and communication.
The basic assumption for comparative analysis of powerful learning environments influencing teaching, learning process and outcomes quality, efficiency, and decision-making models is that meanings are distributed and interpreted through many representational and communicative means. Further is investigated how they affect teaching and learning and which are basic tensions among variety of factors shaping arena for research. The findings of the survey among students of civil and geodetic engineering (N = 350) conducted in 2009 are presented to support investigated teaching and learning practices.

Brief Biography of the Speaker:
Andreja Istenic Starcic holds a B. Sc. in Sociology of Culture (1998) and Ph.D. in Education (2002) University of Ljubljana, Slovenia. She received habilitation for assistant professor in didactics and educational technology. Her research interests include Social impacts of information and communication technology, Evaluation of cognitive performance, Social interaction, Usability, Human decision making and problem solving, Innovative user interface concepts supporting diverse user groups (disable, personality traits, cognitive styles), Virtual simulations and games.
She has been a member of research groups:
-Research in education (2000-2002), University of Ljubljana, Faculty of Arts and Humanities;
-Management and informatisation of education and employability (2004-2004), University of Primorska, Faculty of Management;
-E-construction engineering (2006-), University of Ljubljana, Faculty of Civil and Geodetic engineering, Institute of Construction, Earthquake Engineering and Computing.
Dr. Istenic Starcic has published several referred journal and conference papers, workbooks and monographs. Her publication also includes invited state-of-the-art chapters in international scientific monographs. She is in editorial board of international journals: International journal: Emerging technologies in learning - iJET http://online-journals.org/i-jet/about.
International journal of advanced corporate learning - iJAC http://online-journals.org/i-jac/
Dr. Starcic is a convenor in The European Educational Research Association EERA Didactic section http://www.eera-ecer.eu/networks/didactics/
She was giving courses at Aalto University Helsinki Finland, Belfast Queens University Northern Ireland, Lulea University of Technology Sweden, and University of Turku Finland.

Plenary Lecture 5

The Role of Art, Spiritual, Science, Engineering & Technology for Improving Quality of Human Resources

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Abstract: This paper presents Art, Spiritual, Science, Engineering & Technology (ASSET) to support the Programs of Education & Training (E & T) and Research & Development (R & D) in Indonesia. The prosperity of the Human Resources will be approached from prosperity approach, which is mainly emphasized with three universe of aspects: Physical, Intellectual, Emotional, and Spiritual (PIES) aspects. There are three basic requirements for developing PIES aspects : Material, Energy and Information (MEI). Social welfare and increase of life quality are desired output that must be attained from the MEI aspects. Current standard of living of human being, should be reported as feedback information in the programs of E&T and R&D activities. In global communication, developed countries and developing countries should build several attractive and sound symbiosis bridges, to prevent loss of universe balances. High quality of human resources as products of E&T and R&D activities, have social impacts not only in developed countries but also in developing countries. A new work force strategy without denying the existing of high quality of human resources is established by retooling the work forces, thus the challenges of social impacts could be answers wisely and would be bright opportunities to improve human standards of living.

Brief Biography of the Speaker:
Professor Rohani Jahja Widodo was born February 09, 1938 in Yogyakarta, Java, Indonesia. He received his BSEE from Electrical Engineering Department, Institut Teknologi Bandung Indonesia in 1962, MSEE from Electrical Engineering Department, University of Kentucky Lexington, USA in 1964 and Doctor of Engineering (DE) Institut Teknologi Bandung Indonesia in 1985.
He was lecturer at the Electrical Engineering Department, Institut Teknologi Bandung, Java, Indonesia,1962 to 1987, Professor in Control Engineering at the Electrical Engineering Department, Institut Teknologi Bandung, Java, Indonesia,1987 to 2003 and Professor Emeritus in Control Engineering since 01 March 2003 up to now.
He is member of the Institution of Engineers Indonesia (PII),the Control Systems Society of the IEEE, the Asian Control Professors Association (ACPA) and the Indonesian Instrumentation Systems Society (HIMII).
He is President of the ICSS (the Indonesian Control Systems Society)/Masyarakat Sistem Kendali Indonesia (MASDALI) : 1996 up to now, Advisor for the (ADI : Asosiasi Dosen Indonesia) Indonesian Staff Members Association, West Java Chapter 2005 to 2010 and The Chairman of the “Perhimpunan Psiko Neuro Immunologi Indonesia” (PPNII), West Java Chapter 2005 to 2010.
He attended some short courses (Summer Courses) at the UCLA, California, USA, Summer 1964 on Optimization Theory, at the ICTP, Trieste, Italy, Summer 1974 and at the Kanazawa Instituteof Technology, Kanazawa, Japan, in Computer Technology,Summer 1985.
He was Research Fellow at the Delft Technologial University, the Netherland 1971-1972 and Tokyo University, Japan, 1979.
He was visiting scientist at the Sophia University, Tokyo, Japan, Summer 1984 and at the Kyoto Institute of Tchnology, Kyoto Japan, Summer 1989.

Plenary Lecture 6

Language Aspects in Science and Technology Education: Novel Approaches for New Technologies

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Abstract: Language is the fundamental tool for the development of thought. It is therefore an essential tool for all the inquiry aspects in the sciences (identifying relationships between pieces of information, identifying investigation questions, formulating and verifying hypotheses, making inferences) and in the trains of thoughts leading from information to interpretation and ultimately to theory. It is thus extremely important that science students acquire sufficiently sophisticated levels of language-mastering to be able to use it for a real familiarization with the main aspects of doing science.

In recent years, there is a growing concern about fast deterioration of the quality of language-mastering among the young generation, mostly as a result of the dominant use of communication technologies for which short, grammatically and logically unconnected sentences are viewed as the most suitable options. Such deterioration poses a threat to the development of science thoughts in future years, because of the risk of inadequacies in the ability to utilise the essential thought-development tool to its full power.

The current presentation suggests that the development of language-mastering abilities up to the sophistication levels that are needed for the generation and communication of scientific information needs to become a relevant component of science and technology education. This requires the design of novel approaches, integrating the increasing utilization of new, computer-based, educational technologies with the development of language-mastering abilities. The design is challenging, because of the complexity of the language skills that are relevant within the sciences ? skills concerning the identification and expression of individual logical or method-related relationships (e.g., cause-effect, hypothesis-thesis, condition-consequence) and of comprehensive logical and interpretation frameworks. The presentation proposes and discusses some options, considering implementation pathways, feasibility assessments and expected impacts, on the basis of long experience with the analysis of language-related difficulties encountered by science students and of the interplays between language communication and other communications forms, like visualization.

Brief Biography of the Speaker:

Education
• Degree in chemistry, University of Pisa, Italy, 1973. Thesis in theoretical chemistry.
• PhD in chemistry. Moscow State University, Russia, 1982. Thesis in theoretical chemistry.

Research interests
• Theoretical/computational chemistry. Specific interest in the computational study of biologically active molecules.
• Chemical education and science education in general. Specific interest in conceptual understanding and in the roles of language and of visualization in science education.

Publications
• Several publications for each of the research areas mentioned above.
• Author of a chemistry textbook (in Italian).

Work experience
Worked in institutions in Sub-Saharan Africa for the past 21 years:
• 1988-1992: University of Zambia
• 1993-1996: National University of Lesotho
• since 1997: University of Venda.

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