

Editors

F. G. Lupianez
Antoanela Naaji



Recent Advances in Educational Methods

- **Proceedings of the 10th International Conference on Engineering Education (EDUCATION '13)**
- **Proceedings of the 1st International Conference on Early Childhood Education (ECED '13)**

Cambridge, UK, February 20-22, 2013



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Educational Technologies Series | 4

ISSN: 2227-4618
ISBN: 978-1-61804-163-0

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Published by WSEAS Press
www.wseas.org

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All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: <http://www.worldses.org/review/index.html>

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Plenary Lecture 1

Using Computer Fluid Dynamics (CFD) for Teaching Hydrodynamics in Maritime Faculties



Professor Dumitru Dinu
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Abstract: ANSYS FLUENT is a CFD program based on finite volume calculation. It solves the Navier-Stokes equations for different cases. To calculate, we need to define geometry, corresponding to our problem and to create the mesh (the volumes in 3D or the squares in 2D). After realizing the geometry and the mesh we proceed to calculate. Post processing is also a very important phase.

Our students meet the program on courses, applications and research (master and Ph.D. studies).

We use this program to illustrate fluid properties and some important phenomena in hydrodynamics: Bernoulli's equations for the relative movement of ideal non-compressible fluid, hydrostatic forces, flow with and without circulation around profiles, velocity distribution in circular conduits, forces on the hydrodynamic profiles, induced resistances in the case of finite span wings, boundary layer, etc.

Also the students can make a comparison between the results obtained in the laboratory and the results of simulation using Computer Fluid Dynamics. In the paper we give an example: flow measurement using the aperture stop. Mainly, these method is based on the fact that by throttling the flow section, there arises a difference between the pressure upstream and downstream from throttling which depends on the stream velocity and, implicitly, on flow. Vectorial representation of the velocity field is very important to understand the problem.

Finally, we emphasize the possibility to use CFD for research, mentioning some of the relevant works in the field. In one of them we studied the flow through circular conduit using distortional similarity by comparing "experimental" results with theoretical results, calculated by application of scale of physical magnitudes.

The program can be used as a "virtual stand" – is one of the interesting conclusions of the paper.

Brief Biography of the Speaker: Dumitru Dinu graduated from the University of Galati, Diplomat Engineer, Naval Architect and doctor in Technical Science – Fluid Mechanics of the same University. First, he worked in maritime research, deep diving systems and marine technologies in Romanian Institute for Marine Research. In 1990, Dumitru Dinu begins an academic career in Constanta Maritime University. Professor from 1993 and Doctoral Thesis Supervisor from 2001, he is a recognized specialist in Fluid Mechanics and Marine Technologies. He wrote 10 books and over 50 scientific papers in the fields: Marine Technologies, Fluid Mechanics and Hydraulic Machines, Marine Pollution, Maritime Education and Training. Former Rector of Constanta Maritime University, Prof. Dinu leads now the Marine Engineering research Center of the University. His researches focus now on Design and research in naval field using Computer Fluid Dynamics.

Plenary Lecture 2

Without Parents Towards Successful Initial Literacy in Preschool Period with the Help of Instruments Protected by Letters Patent



Professor Jozica Bezjak

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Abstract: Successfulness of the contemporary method of initial literacy was the research's matter. Our aim was to manufacture innovative instruments for reading and writing that can be used for preschool children – electronic didactic tablets, anatomically designed pen and sound picture books, and to test them in practice in kindergartens, first grades of nine-year primary school, programmes for children with special needs and with illiterate adults. Moreover, we questioned the current method of the initial literacy. We do not believe in the reasonableness of writing over-dimensional letters on the blackboard and in the notebook as this takes children too much energy and is completely inadequate since we do not write with the shoulder and the elbow, but we with the twist of the wrist and usually with three fingers.

That is why we started to think how we could make initial reading and writing easier and of a shorter way to literacy. The idea's concept was an electronic didactic tablet. To make reading more pleasant, there is a picture book, available in classic and electronic sound form.

Furthermore, to make the writing table even more useful and attractive we added additional electronic devices which enable:

- the display of the number of the repetitions of writing on electronic tablet (LCD display),
- rewarding the user after certain number of repetitions with automatic sound play of melodies from the sound picture book,
- the possibility of connecting with the PC which would increase didactic tablet's applicability (vocal dictating letters, keeping statistics...).

The results of the research showed extraordinary successfulness of our innovative method after only a fourteen day usage of the instruments. In conclusion we came to cognition of didactical instruments applicability in improving individual's handwriting style and in medical purposes during the rehabilitation of individuals after the stroke.

Brief Biography of the Speaker: Jožica Bezjak in the field of education I achieved a diploma thesis, Master's and Ph.D. degree in the field I advanced materials and technologies in Naravoslovnotehnični Faculty, University of Ljubljana and in pedagogy thesis II: IGIP - Titel Europäischer Ingenieurpädagoge - "ING - PEAD IGIP" Austria and Ph.D. degree II.: Project-Unterrichtsarbeit in der im technische Kreativität schulischen Kurrikulum: von der bis zur Kindergarten technische Fakultätsausbildung, Austria. Scientific research and educational work is carried out from 1986 to 2011na various scientific and educational institutions-the Natural Sciences and Engineering Faculty at the field of advanced materials and technologies and at the Pedagogical Faculty and the University of Primorska, the University of Klagenfurt, University of Usti nad Labín, University of Pilsnu in the Czech Republic, where I lectured at the undergraduate postgraduate study program Mathematics, Engineering, Physics, Engineering, Pre-school and classroom instruction.

He has more than 692 works in COBISS Co-operative online bibliographic system, of which more than 20 monographs, which has also received numerous honors and awards, among them the two highest state award, the medal winner Socrates SOVA (2003) for the highest achievements in the the academic teaching of "special engaged and excellent teaching in higher education", and won the highest national award of Slovenia for the highest achievements in scientific research and teaching (2005).

She is the president of the Association of Teachers of technical creativity of Slovenia, where over the last ten years (2003 - 2011) was also president of the Organizing and Scientific Committee and editor of the International Scientific Symposium "Technical Creativity and the school's curricula with the form of projectlearning" From idea to the product "- from the Kindergarten to the technical faculty, Portoroz, Slovenia.