V	olume	8.	Number	1.	2010
---	-------	----	--------	----	------



World Transactions on Engineering and Technology

Education

Editor-in-Chief Zenon J. Pudlowski World Institute for Engineering and Technology Education (WIETE) Melbourne, Australia

Melbourne 2010	

World Transactions on Engineering and Technology Education

WIETE Partners



Association of Taiwan Engineering Education and Management (ATEEM) Taichung, Taiwan



Faculty of Electrical, Electronic, Computer & Control Engineering Technical University of Łódź, Łódź, Poland



Maharashtra Academy of Engineering and Educational Research Pune, Maharashtra, India



Russian Association of Engineering Universities Moscow, Russia



College of Engineering & Engineering Technology Northern Illinois University DeKalb, Illinois, USA



Institute of Technology *Harapan Bangsa* Bandung, Indonesia



MEPCO Schlenk Engineering College Sivakasi, Tamil Nadu, India



Technological Education Institute of Piraeus Piraeus-Athens, Greece



Commonwealth Science and Technology Academy for Research (C-STAR) Chennai, India



K.S. Rangasamy College of Technology Tiruchengode, India



Polytechnic Institute of New York University New York, USA



VMKV Engineering College Vinayaka Mission's University Salem, Tamil Nadu, India



Department of Electrical and Power Engineering, AGH University of Science & Technology, Cracow, Poland



M. Kumarasamy College of Engineering, Thalavapalayam Karur, India



RMK Engineering College Chennai, Tamil Nadu, India

Published by:

World Institute for Engineering and Technology Education (WIETE) 34 Hampshire Road, Glen Waverley, Melbourne, VIC 3150, Australia

E-mail: info@wiete.com.au Internet: http://www.wiete.com.au

© 2010 WIETE

ISSN 1446-2257

Articles published in the World Transactions on Engineering and Technology Education (WTE&TE) have undergone a formal and rigorous process of peer review by international referees.

This Journal is copyright. Apart from any fair dealing for the purpose of private study, research, criticism or review as permitted under the Copyright Act, no part of this Journal may be reproduced by any process without the written permission of the publisher.

Responsibility for the contents of these articles rests upon the authors and not the publisher. Data presented and conclusions developed by the authors are for information only and are not intended for use without independent substantiating investigations on the part of the potential user.

World Transactions on Engineering and Technology Education

EDITOR-IN-CHIEF

Prof. Zenon J. Pudlowski World Institute for Engineering and Technology Education (WIETE)

> 34 Hampshire Road, Glen Waverley, Melbourne, VIC 3150, Australia Tel/Fax: +61 3 85550953, E-mail: zenon.pudlowski@wiete.com.au

Internet: http://www.wiete.com.au

ASSOCIATE EDITORS

Dr Elena A. Danilova Monash University, Clayton, Melbourne, Australia Monash University, Clayton, Melbourne, Australia Dr Ian R. Dobson

Ms Krystyna Wareing Independent Communications Consultant, Crawley, West Sussex, England, UK

ASSISTANT EDITOR &

MANAGER

Ms Dianne Q. Nguyen Monash University, Clayton, Melbourne, Australia

ADVISORY BOARD MEMBERS

Prof. Hosni I. Abu-Mulaweh Indiana University-Purdue University Fort Wayne, USA Middle East Technical University, Ankara, Turkey Prof. Tuncay Birand Prof. Ahmad Ibrahim Yorkville University, Toronto, Ontario, Canada

Commonwealth Science and Technology Academy for Research, Chennai, India Prof. Adinarayana Kalanidhi

Prof. Efrossini C. Kalkani National Technical University of Athens, Athens, Greece

Maharashtra Academy of Engineering and Educational Research, Pune, India Prof. Mangesh T. Karad

Prof. Krzysztof Kluszczyński Silesian University of Technology, Gliwice, Poland Prof. Romanas V. Krivickas Kaunas University of Technology, Kaunas, Lithuania Edith Cowan University, Mount Lawley, Perth, Australia A/Prof. Wojciech Kuczborski A/Prof. S. Paul Maj Edith Cowan University, Mount Lawley, Perth, Australia

Prof. Kaliappan Manivannan Commonwealth Science and Technology Academy for Research, Chennai, India Prof. George Metaxas Technological Education Institute of Piraeus, Piraeus-Athens, Greece

Dr Bruce Moulton University of Technology, Sydney (UTS), Sydney, Australia

San José State University, San José, USA Prof. Nikos J. Mourtos

Prof. Andrew Nafalski University of South Australia, Mawson Lakes, Adelaide, Australia Prof. Alexey F. Nesterov Russian Association of Engineering Universities, Moscow, Russia

Prof. Derek O. Northwood University of Windsor, Windsor, Canada Prof. Ákos Rédey University of Pannonia, Veszprém, Hungary Prof. Ian M. Robinson Edge Hill University, Ormskirk, UK

Prof. Harold P. Sjursen NYU Polytechnic Institute, New York, USA

Slovak University of Technology in Bratislava, Bratislava, Slovakia Prof. Robert Špaček

Prof. David W.S. Tai Association of Taiwan Engineering Education and Management, Taichung, Taiwan

Ir. Samuel Tarigan Institute of Technology Harapan Bangsa, Bandung, Indonesia Prof. Algirdas V. Valiulis Vilnius Gediminas Technical University, Vilnius, Lithuania

Prof. Marika Vicziany Monash University, Melbourne, Australia Prof. Promod Vohra Northern Illinois University, DeKalb, USA Prof. Sławomir Wiak Technical University of Łódź, Łódź, Poland

World Transactions on Engineering and Technology Education

Contents

Z.J. Pudlowski	Editorial	6	
T. Clausen & S.T. Hagen	An engineering education response to a globalising world	7	
C-Y. Chen, Y-J. Lee, Y-C. Huang, C-L. Huang & J-B. Yao	Application of Strategic Matrix Analysis to the student recruiting strategies of technological and vocational universities		
B. Moulton & D. Johnson	Robotics education: a review of graduate profiles and research pathways	26	
T. Keen & S. Thatcher	Experiential learning using case studies of aircraft accidents in aviation meteorology courses	32	
C-M. Chou, C-H. Shen & H-C. Hsiao	An analysis of the key factors of high-quality instruction of teachers in institutes of technology	37	
D.W.S. Tai, Y-C. Hu, R. Wang & J.F.M. Chen	· · · · · · · · · · · · · · · · · · ·		
K-H. Tseng, C-C. Chang, W-P. Chen & S-J. Lou	The use of a computer-mediated environment to promote learning performance through concept mapping in a nanometre course	50	
V.P. Kommula, J. Uziak & M.T. Oladiran	Peer and self-assessment in engineering students' group work	56	
W. Yang, A. Martin, R.D. Adams, J.Z. Zhang & K. Burbank	A case study on intentional learning in engineering and technology education	61	
Y.M. Lin & F.S. Chen	A stress coping style inventory of students at universities and colleges of technology	67	
S-J. Lou, R-C. Shih, H-P. Yang, K-H. Tseng & study of the energy technology course at a junior high school G-C. Wu		73	
H-C. Hsiao, C-H. Shen, C-M. Chou & L-Y. Chang	Developing the evaluation indices of organisational innovation in vocational high schools: the perspective of a Taiwanese case	79	
W-J. Shyr	Experiences with a hands-on activity to enhance learning in the classroom	86	
J. Njock Libii	Laboratory exercises to study viscous boundary layers in the test section of an open-circuit wind tunnel	91	
K-Y. Lin, T-C. Hu & H-C. Tsai	Teaching mathematics, science and technology concepts through designing hands-on and reflective activity	97	
O. Fofanov, T. Sidorenko & O. Zamyatina	Development of professional communicative competence of IT-students through learning foreign language for specific purposes	101	
V. Petrescu, R. Ciudin, C. Isarie & V. Nederita	Environmental engineering education - waste management in Romania	107	

J. Uziak, M.T. Oladiran & R.J. Schuhmann	Engineering students' presentations: a focus on results or methodology?	111
N. Spyropoulos, S. Valmis, A. Ganas & G. Metaxas	Land reclamation of surface mining based on imagery intelligence and spatial decision support systems	115
T-C. Hu	A study on the managerial competency of a hospital's basic level nursing directors	120
Index of Authors		124