World Transactions
on
Engineering and Technology
Education

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

© 2012 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.
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 95618247, E-mail: zenon.pudlowski@wiete.com.au
Internet: http://www.wiete.com.au

ASSOCIATE EDITORS

Dr Ian R. Dobson
University of Helsinki, Helsinki, Finland and Monash University, Melbourne, Australia

Dr Dianne Q. Nguyen (Manager)
Monash University & WIETE, Melbourne, Australia

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

ADVISORY BOARD MEMBERS

Prof. Hosni I. Abu-Mulaweh
Indiana University-Purdue University Fort Wayne, Fort Wayne, Indiana, USA

Prof. Samuel C-C. Chang
National Taiwan Normal University, Taipei, Taiwan

Prof. Colin U. Chisholm
Glasgow Caledonian University, Glasgow, Scotland, UK

Prof. Ahmad Ibrahim
Yorkville University, Toronto, Ontario, Canada

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

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

Prof. Krzysztof Kluszczyński
Silesian University of Technology, Gliwice, Poland

A/Prof. Slavko Kocijancic
University of Ljubljana, Ljubljana, Slovenia

Prof. Romanas V. Krivickas
Kaunas University of Technology, Kaunas, Lithuania

A/Prof. Wojciech Kuczborski
Edith Cowan University, Mount Lawley, Perth, Australia

Prof. George Metaxas
Technological Education Institute of Piraeus, Piraeus-Athens, Greece

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. Kin Wai Michael Siu
Hong Kong Polytechnic University, Hong Kong, PRC

Prof. David W.S. Tai
HungKuang University, Taichung, Taiwan

Prof. Jacek Uziak
University of Botswana, Gaborone, Botswana

Prof. Algirdas V. Valiulis
Vilnius Gediminas Technical University, Vilnius, Lithuania

Prof. Promod Vohra
Northern Illinois University, DeKalb, USA

Prof. Sławomir Wiak
Technical University of Łódź, Łódź, Poland
## Contents

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z.J. Pudlowski</td>
<td>Editorial</td>
<td>98</td>
</tr>
<tr>
<td>C-H. Huang</td>
<td>Investigating engineering students’ mathematical modelling competency</td>
<td>99</td>
</tr>
<tr>
<td>J.A. Jay &amp; K.B. Mika</td>
<td>Collaborative research with K-12 students on impacts of climate change on ecosystems in an environmental engineering service-learning course</td>
<td>105</td>
</tr>
<tr>
<td>M.F. Stewart &amp; C.U. Chisholm</td>
<td>Assessment of the impact of emotional competencies on academic achievement within engineering and other student cohorts</td>
<td>110</td>
</tr>
<tr>
<td>S. Ihsen, W. Schneider &amp; K. Scheibl</td>
<td>Interdisciplinary research collaborations and learning processes of engineers and social scientists during the development of a robot for seniors in Europe</td>
<td>116</td>
</tr>
<tr>
<td>L. Fürst &amp; V. Mahnič</td>
<td>A cooperative development system for an interactive introductory programming course</td>
<td>122</td>
</tr>
<tr>
<td>J. Njock Libii &amp; D.M. Drahozal</td>
<td>The influence of the lengths of turbine blades on the power produced by miniature wind turbines that operate in non-uniform flow fields</td>
<td>128</td>
</tr>
<tr>
<td>M-L.M. Hu &amp; M-H. Wu</td>
<td>The effect of concept mapping on students’ cognitive load</td>
<td>134</td>
</tr>
<tr>
<td>O.J. Sealetsa &amp; R. Moalosi</td>
<td>Cognitive and learning styles of the Faculty of Engineering and Technology students: University of Botswana</td>
<td>138</td>
</tr>
<tr>
<td>J. Kasih &amp; S. Susanto</td>
<td>Predicting students’ final results through discriminant analysis</td>
<td>144</td>
</tr>
<tr>
<td>Index of Authors</td>
<td></td>
<td>148</td>
</tr>
</tbody>
</table>