



**World Transactions**  
**on**  
**Engineering and Technology**  
**Education**

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

**Guest Editors**  
**Lucyna Nyka, Jakub Szczepański & Antoni Taraszkiewicz**  
**Gdańsk University of Technology**  
**Gdańsk, Poland**

## World Transactions on Engineering and Technology Education



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



Faculty of Architecture  
Cracow University of Technology  
Kraków, Poland



Faculty of Architecture  
Gdańsk University of Technology  
Gdańsk, Poland



Faculty of Architecture  
Slovak University of Technology  
in Bratislava  
Bratislava, Slovakia



Faculty of Architecture  
Wrocław University of Science  
and Technology  
Wrocław, Poland

Published by:

World Institute for Engineering and Technology Education (WIETE)  
141 The Boulevard, Ivanhoe East, Melbourne, VIC 3079, Australia

E-mail: [info@wiete.com.au](mailto:info@wiete.com.au)

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

© 2024 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)  
141 The Boulevard, Ivanhoe East, Melbourne, VIC 3079, Australia  
Tel/Fax: +61 3 94994339, E-mail: zenon.pudlowski@wiete.com.au  
Internet: <http://www.wiete.com.au>

## MANAGER & ASSOCIATE EDITOR

Dr Dianne Q. Nguyen  
World Institute for Engineering and Technology Education (WIETE),  
Melbourne, Australia

## ASSOCIATE EDITORS

Prof. Andrew Nafalski  
Prof. Derek O. Northwood  
Mrs Dorota I. Pudlowski  
A/Prof. Arthur J. Swart  
Prof. Robert Špaček

University of South Australia, Mawson Lakes, Adelaide, Australia  
University of Windsor, Windsor, Canada  
World Institute for Engineering and Technology Education (WIETE),  
Melbourne, Australia  
Central University of Technology, Bloemfontein, Free State, South Africa  
Slovak University of Technology in Bratislava, Bratislava, Slovakia

## ADVISORY BOARD MEMBERS

A/Prof. Stanislav Avsec  
A/Prof. Kristijan Breznik  
Prof. Magdalena Celadyn  
A/Prof. Pinanta Chatwattana  
Prof. Colin U. Chisholm  
Prof. Barbara E. Gronostajska  
Prof. Ahmad Ibrahim  
A/Prof. Ľubica Ilkovičová  
Prof. Joanna Jabłońska  
Prof. Moon-Soo Kim  
Dr Klara Macháčová  
Prof. Viljan Mahnič  
Prof. George Metaxas  
Prof. Lucyna Nyka  
Prof. Jakub Szczepański  
Prof. Antoni Taraszkiewicz  
Dr Steven Thatcher  
Dr Douglas T.K. Tien  
Prof. Jacek Uziak  
Prof. Algirdas V. Valiulis  
Prof. Aji P. Wibawa

University of Ljubljana, Ljubljana, Slovenia  
International School for Social and Business Studies; College of Industrial  
Engineering, Celje, Slovenia  
*Jan Matejko* Academy of Fine Arts in Kraków, Kraków, Poland  
King Mongkut's University of Technology North Bangkok, Bangkok, Thailand  
Glasgow Caledonian University, Glasgow, Scotland, UK  
Wrocław University of Science and Technology, Wrocław, Poland  
Yorkville University, Toronto, Ontario, Canada  
Slovak University of Technology in Bratislava, Bratislava, Slovakia  
Wrocław University of Science and Technology, Wrocław, Poland  
Hankuk University of Foreign Studies, Yongin, Republic of Korea  
Slovak University of Technology in Bratislava, Bratislava, Slovakia  
University of Ljubljana, Ljubljana, Slovenia  
University of West Attica, Piraeus-Athens, Greece  
Gdańsk University of Technology, Gdańsk, Poland  
Gdańsk University of Technology, Gdańsk, Poland  
Gdańsk University of Technology, Gdańsk, Poland  
Private Consultant, Cairns, Australia  
Taylor's University, Subang Jaya, Selangor, Malaysia  
College of Management and Enterprise, Wałbrzych, Poland  
Vilnius *Gediminas* Technical University, Vilnius, Lithuania  
State University of Malang, Malang, Indonesia

## Contents

Z.J. Pudlowski	Editorial	62
L. Nyka, J. Szczepański & A. Taraszkiewicz	Guest Editorial	63
I. Burda, K. Zielonko-Jung, L. Moutard, A. Vaspart & A. Durand	Towards ecological transformation: developing architectural education and research through L'Art Urbain initiatives	64
B. Kurent & S. Avsec	Interdisciplinary systems thinking and the ICT self-concept in higher education	70
M. Wąsowicz, A. Miśniakiewicz & A.M. Berbesz	Mental models in the process of architectural education: user experience theory and architectural design	77
A.J. Swart	Designing a rigorous learning activity that may help mitigate student academic dishonesty	84
D. Wojtowicz-Jankowska, E. Gil & Z. Belter	Designing learning spaces via an international and interdisciplinary collaborative design studio - an example of collaboration of engineer architects with pedagogy students	90
K. Życzkowska, E. Doria & J. Borucka	Virtual tour as an innovative tool for architectural education - from understanding heritage to creativity stimulation	96
M.J. Żychowska & A. Barańska	The evolution of illustration methods in the process of teaching design	103
W. Mazurkiewicz, A. Kaczorowska, A. Rubczak, J. Wiczerzak & D. Kamrowska-Załuska	User-oriented GIS tools in higher education of urban design and planning	109
K. Macháčová, H. Pifko, L. Krajcsovics, M. Križo & A. Schleicher	Architecture for recovery	115
T. Saiseenin, T. Nern-Ngarm & P. Chatwattana	The outcomes of the development of an immersive virtual reality environment laboratory based on the VRChat platform	122
K. Piątkowska & R.F. Herrera	How did the pandemic impact interaction in student design groups?	129
N. Karelkhan, D. Meiirbekkyzy & P. Gapbarova	High-performance parallel computing on the Param Bilim supercomputer in higher education	137
O. Semenyuk, Z. Malibekuly, U. Dyisebayev, K. Maslov & G. Andabayeva	Features of the urban planning concept of the steppe culture in the educational process	144
Index of Authors		150