

## Contents

### Section I

#### Special Issue

Selected papers from the International Research Symposium on  
Problem Based Learning, IRSPBL 2013

#### Guest Editors

Khairiyah Mohd-Yusof, Erik de Graaff, Anette Kolmos, and Fatin Aliah Phang  
Centre for Engineering Education, Universiti Teknologi Malaysia, Malaysia and Aalborg  
Centre for Problem Based Learning in Engineering Science and Sustainability  
Aalborg University

### Section II

#### Special Issue

Gamification Ecosystems in Engineering Education

#### Guest Editors

Miroslav Minović—University of Belgrade, School of Business Administration, Serbia  
Francisco J. García-Peñalvo—University of Salamanca, Spain  
Nick Kearney—Andamio Education and Technology, Spain

Khairiyah Mohd-Yusof, Erik de Graaff, Anette Kolmos and Fatin Aliah Phang	305–307	Guest Editorial I
Miroslav Minović, Francisco J. García-Peñalvo and Nick Kearney	308–309	Guest Editorial II
<b>Section I</b>		
Kinda Khalaf and Wendy Newstetter	310–323	Globalization of Problem-Driven Learning: Design of a System for Transfer Across Cultures
Claus Monrad Spliid	324–332	Discussions in PBL Project-Groups: Construction of Learning and Managing
Khairiyah Mohd Yusof, Aziatul Niza Sadikin, Fatin Aliah Phang and Azmahani Abdul Aziz	333–347	Instilling Professional Skills and Sustainable Development through Problem-Based Learning (PBL) among First Year Engineering Students
Prue Howard, Matt Eliot, Mohammad G. Rasul, Fons Nouwens and Justine Lawson	348–363	Assessment in PBL—Do We Assess the Learner or the Product?
Shannon M. Chance, John Marshall and Gavin Duffy	364–383	Using Architecture Design Studio Pedagogies to Enhance Engineering Education
Bettina Dahl, Jette Egelund Holgaard, Hans Hüttel and Anette Kolmos	384–395	Students' Experiences of Change in a PBL Curriculum
Erik De Graaff	396–401	The Transformation from Teaching to Facilitation; Experiences with Faculty Development Training
A. Masek	402–408	An Appropriate Technique of Facilitation Using Students' Participation Level Measurement in the PBL Environment
Nur Ayuni Shamsul Bahri, Naziha Ahmad Azli and Narina Abu Samah	409–423	Determining the Elements of Problem Solving Strategies in Project-Based Laboratory (PB Lab) Course
Aida Guerra and Jette Egelund Holgaard	424–437	Enhancing Critical Thinking in a PBL Environment
<b>Section II</b>		
Gilberto Huesca Juárez and María Magdalena Reyes Carballo	438–447	Learning Gains, Motivation and Learning Styles in a Gamified Class
Cheryl A. Bodnar, William M. Bongiorno and Renee Clark	448–456	Evaluating the Effectiveness of Game-Based Learning on Improvement of Student Learning Outcomes within a Sophomore Level Chemical Product Design Class
Quang Tuan Le, Akeem Pedro, Hai Chien Pham and Chan Sik Park	457–467	A Virtual World Based Construction Defect Game for Interactive and Experiential Learning
Robert W. Songer and Kazunori Miyata	468–478	A Playful Affordances Approach to the Design of Gameful Learning

<b>Avinoam Tzimerman, Yale T. Herer and Avraham Shtub</b>	479–490	Supply Chain Education—the Contribution of Gamification
<b>Victor Potier, Catherine Pons-Lelardeux, Michèle Lalanne and Pierre Lagarrigue</b>	491–500	Making Complexity Fun—Machining Procedures in Mechanical Engineering
<b>Oriol Borrás-Gene, Margarita Martínez-Núñez and Ángel Fidalgo-Blanco</b>	501–512	New Challenges for the Motivation and Learning in Engineering Education Using Gamification in MOOC
<b>Ramon Mas-Sansó and Cristina Manresa-Yee</b>	513–520	Gamifying an Artificial Intelligence Course in Engineering Education
<b>Saša Mladenović, Divna Krpan and Monika Mladenović</b>	521–531	Using Games to Help Novices Embrace Programming: From Elementary to Higher Education
<b>Carina S. González, Pedro Toledo and Vanesa Muñoz</b>	532–541	Enhancing the Engagement of Intelligent Tutorial Systems through Personalization of Gamification
<b>M. T. Chan, J. T. Chan, C. Gelowitz and C. W. Chan</b>	542–552	Application of Video Game Artificial Intelligence Techniques for Design of a Simulation Software System for Transportation Engineering Education
<b>Camino Fernández, Gonzalo Esteban, Miguel Á. Conde and Francisco Garcia</b>	553–562	Improving Motivation in a Haptic Teaching/Learning Framework
<b>Velimir Štavljanin, Ivan Milenkovic and Uroš Šošević</b>	563–573	Educational Website Conversion Improvement Using Gamification
<b>Jelena Minović, Božo Drašković and Ivan Stošić</b>	574–581	Gamification of Bioeconomic Prey-Predator Model
	582	Guide for Authors