Contents

Part I

Special Issue

Applications of Engineering Education Research—Part 1

Developing Engineering Competencies

Guest Editors

Susan M. Lord—University of San Diego, San Diego, CA, USA
Cynthia J. Finelli—University of Michigan, Ann Arbor, MI, USA

Ahmad Ibrahim 745 Editorial
Susan M. Lord and Cynthia J. Finelli 746–747 Guest Editorial
Jim Borgford-Parnell, Katherine Deibel and Cynthia J. Atman 748–759 From Engineering Design Research to Engineering Pedagogy: Bringing Research Results Directly to the Students
Alan Cheville 760–770 Transformative Experiences: Scaffolding Design Learning Through the Vygotsky Cycle
Denny Davis, Michael Trevisan, Robert Gerlick, Howard Davis, Jay McCormack, Steven Beyerlein, Phillip Thompson, Susannah Howe, Paul Leiffer and Patricia Brackin 771–783 Assessing Team Member Citizenship in Capstone Engineering Design Courses
Rubén Rebollar, Iván Lidón, Juan L. Cano, Fernando Gimeno and Palle Qvist 784–794 A Tool for Preventing Teamwork Failure: the TFP Questionnaire
Mats Daniels, Åsa Cajander, Arnold Pears and Tony Clear 795–806 Engineering Education Research in Practice: Evolving Use of Open Ended Group Projects as a Pedagogical Strategy for Developing Skills in Global Collaboration
Tamara J. Moore and Margret A. Hjalmarson 820–830 Developing Measures of Roughness: Problem Solving as a Method to Document Student Thinking in Engineering
Tuba Pınar Yıldırım, Larry Shuman and Mary Besterfield-Sacre 831–845 Model-Eliciting Activities: Assessing Engineering Student Problem Solving and Skill Integration Processes
Nikos J. Mourtos 846–859 Challenges Students Face in Solving Open-Ended Problems
Thomas Litzinger, Peggy van Meter, Natalia Kapli, Sarah Zappe and Roxanne Toto 860–868 Translating Education Research Into Practice Within an Engineering Education Center: Two Examples Related to Problem Solving
Steve Krause, Jacquelyn Kelly, AmaneH Tasoójí, James Corkins, Dale Baker and Senay Purzer 869–879 Effect of Pedagogy on Conceptual Change in an Introductory Materials Science Course
Timothy L. J. Ferris, Elena Sitnikova and Andrea H. Duff 891–899 Building Graduate Capabilities to Communicate Research and Plans Successfully
Jonathan Stolk, Robert Martello, Mark Somerville and John Geddes 900–913 Engineering Students’ Definitions of and Responses to Self-Directed Learning
Linda Vanasupa, Jonathan Stolk and Trevor Harding 914–929 Application of Self-Determination and Self-Regulation Theories to Course Design: Planting the Seeds for Adaptive Expertise

Part II

Contributions in: Simulators, Remote Laboratories, Modelling, Curriculum Design, Assessment, Prediction of Students’ Performance, and Innovation

Nenad Jovanović, Dragan Marković, Dejan Živković and Ranko Popović 930–937 SIMAS: A Web-Based Computer System Simulator
Gonzalo Farias, Karl-Erik Arzén, Anton Cervin, Sebastián Dormido and Francisco Esquembre 938–949 Teaching Embedded Control Systems
<table>
<thead>
<tr>
<th>Authors</th>
<th>Pages</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amir Aghakouchak and Emad Habib</td>
<td>963–973</td>
<td>Application of a Conceptual Hydrologic Model in Teaching Hydrologic Processes</td>
</tr>
<tr>
<td>Salvador Perez Canto</td>
<td>974–984</td>
<td>Redesign of Syllabus and Evaluation Procedures to Improve University Teaching in Subjects Related to Industrial Engineering in the Context of the European Higher Education Area</td>
</tr>
<tr>
<td>J. Peláez Vara, J. Ruiz Calvo, J. V. Martín Fraile and F. J. Gómez Gil</td>
<td>985–996</td>
<td>A Pilot Study on the Adaptation of Mechanical Technology Modules to the European Higher Education Area</td>
</tr>
<tr>
<td>Shaobo Huang and Ning Fang</td>
<td>1008–1017</td>
<td>Prediction of Student Academic Performance in an Engineering Dynamics Course: Development and Validation of Multivariate Regression Models</td>
</tr>
<tr>
<td></td>
<td>1027</td>
<td>Guide for Authors</td>
</tr>
</tbody>
</table>