## **Contents**

Contributions in: First Year Courses and Students, Design Assessment, Computer Graphics, Gender Equality, Service Projects, Student Success, Major Selection, K-12 Engineering, Reasoning, Conceptual Knowledge, Creativity, Motivation, Undergraduate Research Experiences, Guided Enquiry Learning, Challenge Based Learning, Active Learning, Gamification, Entrepreneurship, Self-Efficacy, Co-Creation, Employability Skills, Educational Software, Internet of Things, Laboratory Design, Data Analysis, Aerospace Engineering Statics, Thermodynamics

Ahmad Ibrahim	1	Editorial
Kenneth Reid, David Reeping and	2–19	A Taxonomy for Introduction to Engineering Courses
Elizabeth Spingola		
Scott R. Bartholomew, Greg J. Strimel and Andrew Jackson	20–33	A Comparison of Traditional and Adaptive Comparative Judgment Assessment Techniques for Freshmen Engineering Design Projects
Juan Ruiz De Miras, Daniel Expósito, David Rocha and María Dolores Robles	34-44	A Web Application to Support Teaching of Computer Graphics to Engineering Students
Manuel Torres, Sara Ferreira, Armando Sousa, Luciano Moreira and Raquel Torres	45–55	Welcome to Engineering: Gender Equality in Learning and Integration among First Year Students
Idalis Villanueva, Suzanne Jones, LeAnn Putney and Brett Campbell	56–68	Puzzling the Pieces: Conceptual Blocks of Engineering Student Ideas in a Service Learning Project
So Yoon Yoon, Monica Cortez, P. K. Imbrie and Teri Reed	69–87	A Comparative Study of Student Success between First-Time-In-College and First-Time-Transfer Engineering Students
Rachel L. Kajfez and Krista M. Kecskemety, Emily S. Miller, Kathryn E. Gustafson, Kerr L. Meyers, Gregory W. Bucks and Katherine Tanner	y	First-Year Engineering Students' Perceptions of Engineering Disciplines: A Qualitative Investigation
Anthony J. Petrosino and Prateek Shekhar	97–105	Expert Blind Spot Among Pre-service and In-service Teachers: Beliefs About Algebraic Reasoning and Potential Impact on Engineering Education
C. Danielle Grimes, Rachel J. McFalls- Brown, M. Jean Mohammadi-Aragh and Rani W. Sullivan	106–118	A Mixed-Methods Investigation of Multiple Background Factors Affecting Aerospace Engineering Student Success
Christopher Venters, Cassandra Groen, Lisa D. McNair and Marie C. Paretti	119–131	Using Writing Assignments to Improve Learning in Statics: A Mixed Methods Study
Wilson Díaz, Francisco Santamaria and Cesar L. Trujillo	132–140	Creativity in Engineering: An issue of Memes, Domain, Field and Individual
Dong San Choi, Katherine A. Earl, Kelly J. Cross and Geoffrey L. Herman	141–154	The Challenge of Using Research-Based Instructional Strategies: Insights from an Effectiveness Study of the Intrinsic Motivation Course Conversion
Debarati Basu, Vinod K. Lohani and John A. Muffo	155–170	Analysis of Undergraduate Research Experiences in an Interdisciplinary Water Science and Engineering Program
Elliot P. Douglas, M. David Miller, Mirka Koro-Ljungberg, Timothy Wells, Timothy Raymond, Cindy Waters and William L. Hughes	171–186	Guided Inquiry Learning Across Educational Contexts
Kwame. S. Ibwe, Ellen A. Kalinga, Nerey H. Mvungi, Hannu Tenhunen and Ville Taajamaa	187–200	The Impact of Industry Participation on Challenge Based Learning
Eunsik Kim, Ling Rothrock and Andris Freivalds	201–216	An Empirical Study on the Impact of Lab Gamification on Engineering Students' Satisfaction and Learning
Marta Duarte De Barros, Jéssica Galdino De Freitas, Helder Gomes Costa, Ruben Huamanchumo Gutierrez and Cristina Gomes De Souza	217–225	The Choosing of Teaching Methods According to Entrepreneurial Profiles: A Multicriteria Approach
Maizam Alias, Tahira Anwar Lashari, Zainal Abidin Akasah and Mohd Jahaya Kesot	226–235	Self-Efficacy, Attitude, Student Engagement: Emphasising the Role of Affective Learning Attributes Among Engineering Students
Gabriela Ribes-Giner, M. Rosario Perello- Marin and Odette Pantoja Díaz	236–247	Co-creation in Undergraduate Engineering Programs: Effects of Communication and Student Participation
Ali Rizwan, Ayhan Demirbas, Nader Al Sayed Hafiz and Umair Manzoor	248–255	Analysis of Perception Gap between Employers and Fresh Engineering Graduates about Employability Skills: A Case Study of Pakistan
Sasa Adamovic, Marko Sarac, Dusan Stamenkovic and Dalibor Radovanovic	256–262	The Importance of the Using Software Tools for Learning Modern Cryptography
Kimmo Karvinen and Tero Karvinen	263–272	IoT Rapid Prototyping Laboratory Setup

Adrián Mota-Babiloni, Pavel Makhnatch, Joaquín Navarro-Esbrí, Francisco Molés and Rahmatollah Khodabandeh	273–282	Design of an Environmentally Friendly Refrigeration Laboratory Based on Cooling Capacity Calculation for Graduate Students
Wei Zhan	283–291 292	Application of Gauge Repeatability and Reproducibility in Root Cause Analysis of Electronics Problems in an Engineering Technology Course Guide for Authors