Special Issue Current Trends in K-12 Engineering Education

Guest Editors

Wei-Fan Chen, The Pennsylvania State University, USA. Pao-Nan Chou, National University of Tainan, Taiwan.

Wei-Fan Chen and Pao-Nan Chou	285–286	Guest Editorial
Howard Kimmel, Linda Hirsch, Levelle Burr-Alexander and Ronald Rockland	287–294	Engineering & STEM: Complementary Areas of Study
Christine M. Cunningham and Gregory J. Kelly	295–307	Framing Engineering Practices in Elementary School Classrooms
Vivien M. Chabalengula, Sonia A. Bendjemil, Frackson Mumba and Jennifer Chiu	308–320	Nature and Extent of Science and Engineering Practices Coverage in K-12 Engineering Curriculum Materials
Mike Ryan, Jessica Gale and Marion Usselman	321-331	Integrating Engineering into Core Science Instruction: Translating NGSS Principles into Practice through Iterative Curriculum Design
Carlos García-García, Vicente Chulvi Ramos and Julia Galán Serrano	332–345	Sculpture Development as an Informal Activity for Learning Engineering Abilities in K-12 Students
Lyn D. English and Donna King	346–360	Engineering Education with Fourth-Grade Students: Introducing Design-Based Problem Solving
Roxanne A. Moore, Sunni H. Newton and Amanda D. Baskett	361–370	The InVenture Challenge: Inspiring STEM Learning Through Invention and Entrepreneurship
J. Chiu, A. Gonczi, X. Fu and M. D. Burghardt	371–381	Supporting Informed Engineering Design across Formal and Informal Contexts with WISEngineering
Pao-Nan Chou, Wei-Fan Chen, Chong-Yan Wu and Robert P. Carey	382–388	Utilizing 3D Open Source Software to Facilitate Student Learning of Fundamental Engineering Knowledge: A Quasi-Experimental Study
Liliana Fernández-Samacá, Nelson Barrera, Luis Ariel Mesa and Wilson Javier Pérez-Holguín	389–397	Engineering for Children by using Robotics
Linda S. Hirsch, Suzanne Berliner-Heyman and Jacqueline L. Cusack	398-407	Introducing Middle School Students to Engineering Principles and the Engineering Design Process Through an Academic Summer Program
Andreja Drobnič Vidic	408-419	Teachers' Beliefs about STEM Education Based on Realisation of the "Energy as a Value" Project in the Slovenian School System
Nuri Balta, Sevda Yerdelen-Damar and Adam R. Carberry	420–429	Vocational High School Students' Engineering Epistemological Beliefs
Wen-Jye Shyr, Wei-Chin Liu, Po-Wen Liu and Chi-Feng Feng	430–440	Development and Validation of Energy Technology Competency Survey for Vocational High School Student in Taiwan
Meltem Alemdar, Jeremy A. Lingle, Stefanie A. Wind and Roxanne A. Moore	441–452	Developing an Engineering Design Process Assessment Using Think-Aloud Interviews
Morgan M. Hynes, Corey Mathis, Şenay Purzer, Anastasia Rynearson and Emilie Siverling	453–462	Systematic Review of Research in P-12 Engineering Education from 2000-2015
Holly M. Matusovich, Cheryl A. Carrico, Marie C. Paretti and Matthew A. Boynton	463–475	Engineering as a Career Choice in Rural Appalachia: Sparking and Sustaining Interest
Pao-Nan Chou and Wei-Fan Chen	476–488	Elementary School Students' Conceptions of Engineers: A Drawing Analysis Study in Taiwan
Michelle R. Oswald Beiler	489–503	Sustainability Interest and Knowledge of Future Engineers: Identifying Trends in Secondary School Students
	504	Guide for Authors

