Sustainable Innovations in Education and Technology (SIET) Volume 1

Series Editor:

## **Chun-Yen Chang**

Chair Professor, Director of Science Education Center, National Taiwan Normal University, Taipei, Taiwan

#### Sustainable Innovations in Education and Technology (SIET) Book Series

This series of conference proceedings in "Sustainable Innovations in Education and Technology" (SIET) is a collection of research papers selected from Eurasian Conference on Educational Innovation (ECEI) and other excellent papers focused on sustainable innovations in education and technology. This series of conference proceedings aims to highlight researches that can leverage sustainable innovations in educational development and technological advancement, with the hope of encouraging dialogue among policy makers, educational researchers, technologists and practitioners. The series of conference proceedings not only seeks to support works that attempt to consider, explore, and investigate solutions to current educational issues and challenges through the use of emerging technologies, but also examine possible impacts of these innovative approaches on educational systems across various time frames. The ultimate goal of this series of conference proceedings is to employ emerging technologies leading to education innovations.

For more information, please visit: http://www.iikii.sg/bookseries/siet.

Proceedings of the Eurasian Conference on Educational Innovation 2018 (ECEI 2018), Macau, P.R. China, January 26–29, 2018

# **STEM Education and E-learning**

*Editors:* 

Charles Tijus Teen-Hang Meen Chun-Yen Chang



#### **Editors**:

### **Charles Tijus**

Human & Artificial Cognition, Université de Vincennes - Paris 8, France

### Teen-Hang Meen

Distinguished Professor, Department of Electronic Engineering, National Formosa University, Yunlin, Taiwan

### Chun-Yen Chang

Chair Professor, Director of Science Education Center, National Taiwan Normal University, Taipei, Taiwan

ISSN: 2661-4251 (Electornic)

Sustainable Innovations in Education and Technology (SIET)

ISBN: 978-981-14-2063-4 (eBook)

https://doi.org/10.35745/978-981-14-2063-4

Proceedings of the Eurasian Conference on Educational Innovation 2018 (ECEI 2018), Macau, P.R. China, January 26–29, 2018

Published by International Institute of Knowledge Innovation and Invention Private Limited (IIKII PTE LTD), Singapore.

© International Institute of Knowledge Innovation and Invention Private Limited (IIKII PTE LTD) 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use. The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

## **Editorial**

This volume represents the proceedings of the Eurasian Conference on Educational Innovation 2018 (ECEI 2018). This conference was organized by the International Institute of Knowledge Innovation and Invention (IIKII), and held January 26-29, 2018 in Macau, P.R. China. The conference provided a unified communication platform for researchers in a range of topics, such as K-12 Education, University/College Education, Cognitive, Affective, and Social Aspects of Teaching and Learning, Teacher Training/ Education, Professional Development, Curriculum Development, Educational Measurement, Evaluation, and Assessment, Cooperative/Collaborative Learning and Environments, Problem/Project Based Learning, Didactic/Pedagogical Issues, STEM Education, Teaching/Learning Strategies, Methodologies for Educational Research, Metaphors, Analogies, Models, Animations or Simulations in Teaching and Learning, Instructional Design News, Distance Education, E-Learning, Educational Technology, ICT in Education, Blended Learning, Knowledge Management, Learning Management Systems, Human Computer Interactions, Web 2.0 Tools for Education, Other Fields About Education, Educational Innovation: Ethics and Values, Educational Innovation: Literature and Media, Educational Innovation: Philosophical Investigations, Educational Innovation: Religious Perspectives and Projects and other related fields. This proceedings volume enables interdisciplinary collaboration of science and engineering technologists in the academic and industrial fields, as well as networking internationally