

ISSN: 1305-8215
e-ISSN: 1305-8223

May 2020
Volume 16
Issue 5

EURASIA JOURNAL OF MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION

Indexed by SCOPUS® & ERIC



MODESTUM

Editors-in-Chiefs

Chun-Yen CHANG, National Taiwan Normal University (NTNU), TAIWAN

Lianghuo FAN, University of Southampton, UNITED KINGDOM

Editors

Engineering Education

Xiangyun DU, Qatar University, QATAR & UNESCO PBL Center for Engineering and Science Education, Aalborg University, DENMARK

Teen-Hang MEEN, National Formosa University, TAIWAN

Mathematics Education

Kwok Cheung CHEUNG, University of Macau, MACAU

Mei-Shiu CHIU, National Chengchi University, TAIWAN

Oh Nam KWON, Seoul National University, SOUTH KOREA

Joohee LEE, University of Texas at Arlington, USA

Sandra NITE, Texas A&M University, USA

Chunxia QI, Beijing Normal University, CHINA

Alison Castro SUPERFINE, University of Illinois at Chicago, USA

Der-Ching YANG, National Chiayi University, TAIWAN

Science Education

Onofrio Rosario BATTAGLIA, University of Palermo, ITALY

Hayat HOKAYEM, Texas Christian University, USA

Hui JIN, Educational Testing Service, USA

Jing LIN, Beijing Normal University, CHINA

Silvija MARKIC, University of Education Ludwigsburg, GERMANY

Jan Alexis NIELSEN, University of Copenhagen, DENMARK

Mariusz PANCZYK, Medical University of Warsaw, POLAND

Milan KUBIATKO, Jan Evangelista Purkyně University, CZECH REPUBLIC

Sarantos PSYCHARIS, School of Pedagogical and Technological Education, GREECE

Wan NG, University of Technology Sydney, AUSTRALIA

Technology Education

Denise M. BRESSLER, University of Pennsylvania, USA

M. Shane Tutwiler, University of Rhode Island, USA

Tzu-Hua WANG, National Tsing Hua University, TAIWAN (R.O.C.)

Yi-Shun WANG, National Changhua University of Education, TAIWAN

Zacharia ZACHARIAS, University of Cyprus, CYPRUS

Assistant Editors

Jana FANCOVICOVA, University of Trnava, SLOVAKIA,

E-mail: fankaj@gmail.com

Vanda JANSTOVA, Charles University, Prague, CZECH REPUBLIC,

E-mail: vanda.janstova@natur.cuni.cz

Editorial Board Members

Mathematics Education

Lyn ENGLISH, Queensland University of Technology, AUSTRALIA

Uwe GELLERT, Freie Berlin University, GERMANY

Anjum HALAI, Aga Khan University, PAKISTAN

Gert KADUNZ, University of Klagenfurt, AUSTRIA

Mailizar MAILIZAR, Syiah Kuala University, INDONESIA

Charis VOUSINA, University of Southampton, UNITED KINGDOM

Science Education

Fouad ABD-EL-KHALICK, University of Illinois at Urbana-Champaign, USA

Agustin ADÚRIZ-BRAVO, Universidad de Buenos Aires, ARGENTINA

María Pilar Jiménez ALEIXANDRE, Universidade de Santiago de Compostela, SPAIN

Michael ALLEN, Kingston University, UK

Kyriacos ATHANASIOU, National and Kapodistrian University of Athens, GREECE

Alipaşa AYAS, Bilkent Üniversitesi, TURKEY

Nélio BIZZO, Universidade de São Paulo, BRAZIL

Saouma BOUJAOUDE, American University of Beirut, LEBANON

Lynn A. BRYAN, Purdue University, USA

Peter C. CORMAS, California University of Pennsylvania, USA

Colleen T. DOWNS, University of KwaZulu-Natal, SOUTH AFRICA

Jan H. VAN DRIEL, University of Melbourne, AUSTRALIA

Ingo EILKS, University of Bremen, GERMANY

Olle ESKILSSON, Kristianstad University, SWEDEN

Anna Maria GRUGNETTI, University of Pavia, ITALY

Gürol IRZİK, Sabancı Üniversitesi, TURKEY

Marika KAPANADZE, Ilia State University, GEORGIA

Gregory J. KELLY, The Pennsylvania State University, USA

Sarika KEWALRAMANI, Monash University, AUSTRALIA

Vanessa KIND, Durham University, UK

Vincentas LAMANAUSKAS, University of Siauliai, LITHUANIA

Jari LAVONEN, University of Helsinki, FINLAND

Norman G. LEDERMAN, Illinois Institute of Technology, USA

Rachel MAMLOK-NAAMAN, Weizmann Institute of Science, ISRAEL

Sonya N. MARTIN, Seoul National University, REPUBLIC OF KOREA

Mansoor NIAZ, Universidad de Oriente, VENEZUELA

Pernilla NILSSON, Halmstad University, SWEDEN

Rolf V. OLSEN, University of Oslo, NORWAY

Kamisah OSMAN, Universiti Kebangsaan Malaysia, MALAYSIA

Paul PACE, University of Malta, MALTA

Pavol PROKOP, Trnava University, SLOVAKIA

Sarantos PSYCHARIS, School of Pedagogical and Technological Education - ASPETE, GREECE

Martin RUSEK, Charles University, CZECH REPUBLIC

Rohaida Mohd. SAAT, University of Malaya, MALAYSIA

Chieh-Jen SHIEH, Huaqiao University, CHINA

Kenneth TOBIN, The Graduate Center of CUNY, USA

Technology Education

Chin-Chung TSAI, National Chiao Tung University, TAIWAN

Lung Hsiang WONG, Nanyang Technological University, SINGAPORE

The Eurasia Journal of Mathematics, Science and Technology Education (Abbrev. EURASIA J. Math., Sci Tech. Ed. or EJMSTE) is an English Open Access peer-reviewed journal publishing articles on all aspects of Mathematics, Science and Technology Education with ISSN: 1305-8223 (online) and 1305-8215 (print). The journal is published 12 times in a year, and strictly adheres to the principles of the peer review process.

EURASIA Journal of Mathematics, Science and Technology Education encourages submissions from all authors throughout the world. Manuscripts are judged by two experts solely on the basis of their contribution of original data, ideas and their presentation. All manuscripts must comply with Manuscript Preparation Guidelines. Submitted manuscripts must not have been published, accepted for publication or be under consideration elsewhere.

Submissions: EJMSTE has a fully online review system. This system offers authors the convenience of submitting their manuscripts via **EditorialPark**. Please send your manuscripts an MS Word attachment to the editors via the following address: <https://www.editorialpark.com/ejmste/>

Eurasia Journal of Mathematics, Science and Technology Education (EJMSTE) is a monthly journal published online 12 times annually in **January, February, March, April, May, June, July, August, September, October, November, and December**.

EJMSTE is indexed and/or abstracted in **ROAD, EdNA Online Database, Education Research Index, ERIC, ERIH, Genamics JournalSeek, Google Scholar, Higher Education Teaching and Learning Journals, Higher Education Research Data Collection, MathDi, PsycINFO, SCOPUS (Elsevier), TOC Premier Database, Ulrich's Periodicals Directory, ZDB - Zeitschriftendatenbank**.

Publication of any material submitted by authors does not necessarily mean that the journal, publisher, editors, or any of the editorial board members endorse or suggest the content. Publishing decisions are based and given only on scholarly evaluations. Apart from that, decisions and responsibility for adopting or using partly or in whole any of the methods, ideas or the like presented in EJMSTE pages solely depends on the readers' own judgment.

Published by: **MODESTUM LIMITED**

Publication Office: 1 Windrush Road, Hilton, Derbyshire DE65 5LB, United Kingdom

Phone: + 44 (0) 208 936 7681

Email: publications@modestum.co.uk

Publisher: <https://modestum.co.uk>

Journal Web: <https://www.ejmste.com>

Twitter: <https://twitter.com/ejmste>

Facebook: <https://www.facebook.com/ejmste>

© 2005-2020. All rights reserved by Modestum Limited. Copyright for Open Access Content is Retained by Authors. Also, authors continue to hold the copyrights of their own papers by acknowledging that their papers are originally published in the EURASIA J Math, Sci & Tech Ed. Hence, articles published are licensed under a "**Creative Commons Attribution 4.0 International License**."

ISSN: 1305-8215 (Print), 1305-8223 (Online)

VOLUME 16 ISSUE 5 CONTENTS (MAY 2020)

- Integration of Science Disciplinary Core Ideas and Environmental Themes through Constructivist Teaching Practices** em1838
Dorothy Holley, Soonhye Park
<https://doi.org/10.29333/ejmste/115583>
- Dead or Alive? Teacher Students' Perception of Invasive Alien Animal Species and Attitudes towards their Management** em1840
Martin Remmele, Petra Lindemann-Matthies
<https://doi.org/10.29333/ejmste/115105>
- Development and Validation of the Middle Grades Computer Science Concept Inventory (MG-CSCI) Assessment** em1841
Arif Rachmatullah, Bitu Akram, Danielle Boulden, Bradford Mott, Kristy Boyer, James Lester, Eric Wiebe
<https://doi.org/10.29333/ejmste/116600>
- Didactic Potential of Using Mobile Technologies in the Development of Mathematical Thinking** em1842
Elena V. Soboleva, Svetlana E. Chirkina, Olga A. Kalugina, Mikhail Yu. Shvetsov, Victor A. Kazinets, Elena B. Pokaninova
<https://doi.org/10.29333/ejmste/118214>
- Investigating Preservice Elementary Teachers' Subject-Specific Self-Efficacy in Teaching Science** em1843
Adam Ali Al Sultan
<https://doi.org/10.29333/ejmste/7801>
- An Evaluation of Undergraduate South African Physics Students' Epistemological Beliefs When Solving Physics Problems** em1844
Leelakrishna Reddy
<https://doi.org/10.29333/ejmste/7802>

EURASIA
JOURNAL
OF MATHEMATICS,
SCIENCE AND
TECHNOLOGY
EDUCATION



MODESTUM