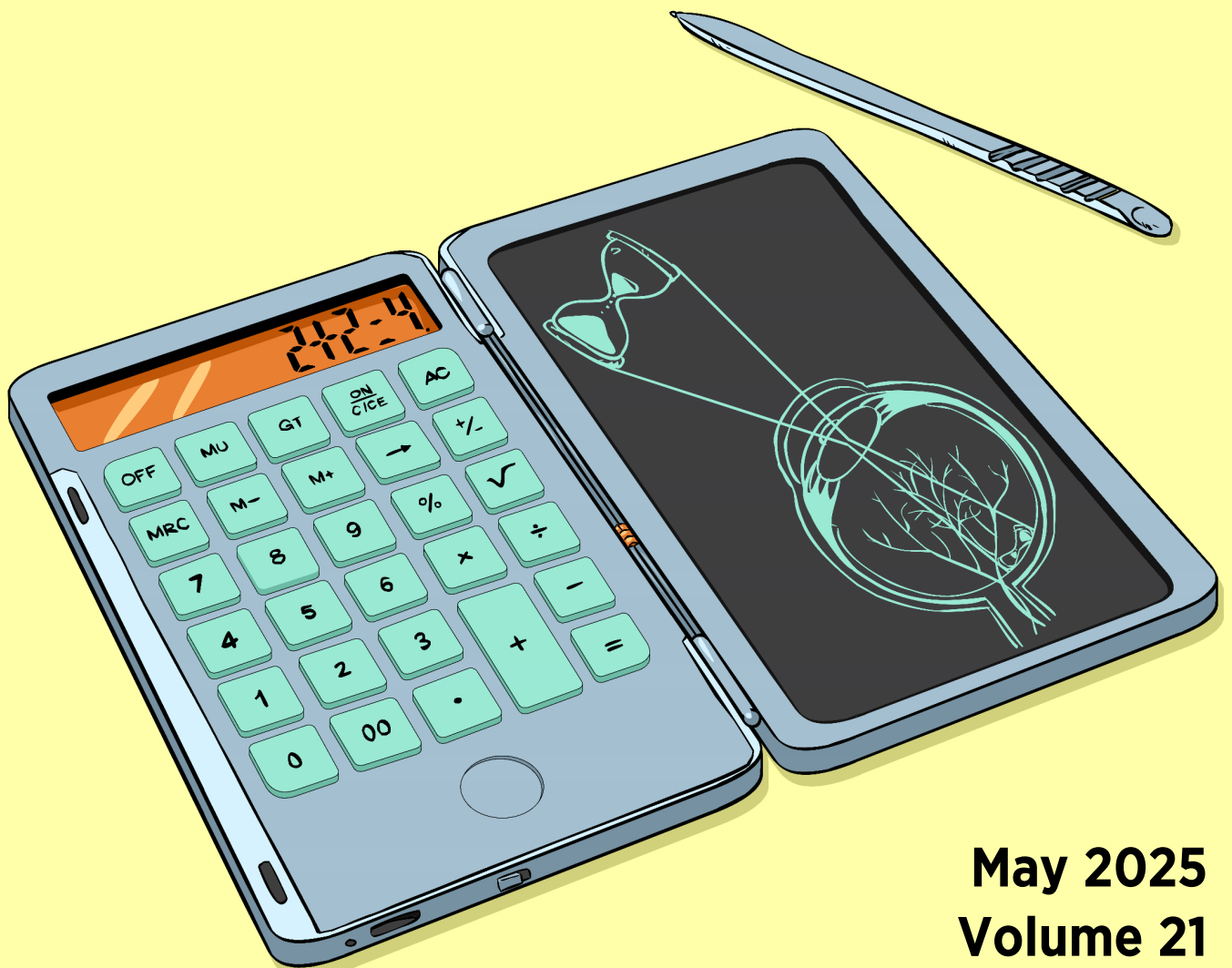


ISSN: 1305-8223

**EURASIA JOURNAL  
OF MATHEMATICS,  
SCIENCE AND  
TECHNOLOGY EDUCATION**



**May 2025**  
**Volume 21**  
**Issue 5**

Published by: **Modestum**

Publication Office: Modestum LTD, 29 Gildredge Road, Eastbourne, East Sussex, BN21 4RU, United Kingdom

Serbia Office: Modestum DOO, Bulevar Zorana Đinđića 125D, sprat 1, stan 12C, 11070 Belgrade, SERBIA

Phone: +381 61 6600107

Email: [publications@modestum.co.uk](mailto: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>

© 2005-2025. All rights reserved by Modestum. 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 Journal of Mathematics, Science and Technology Education. Hence, articles published are licensed under a "Creative Commons Attribution 4.0 International License."

ISSN: 1305-8223 (Online)

# **EURASIA JOURNAL OF MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION**

May 2025  
Volume 21  
Issue 5



*This page is intentionally left blank*

## EURASIA JOURNAL OF MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION

---

**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). 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](https://www.editorialpark.com/ejmste/). 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

- [EBSCO](#)
- [ERIH PLUS](#)
- [Google Scholar](#)
- [Genamics JournalSeek](#)
- [PsycINFO](#)
- [PSYINDEX](#)
- [ROAD](#)
- [SafetyLit](#)
- [SCOPUS](#)
- [Scimago](#)

All articles are archived by:

- The British Library
- Portico

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.

## EDITORIAL BOARD

---

### Editors-in-Chiefs

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

**Lianghuo FAN**, University of Southampton, UNITED KINGDOM & East China Normal University, CHINA

**Philipp BITZENBAUER**, Universität Leipzig, GERMANY

### Editors

#### Engineering Education

Teen-Hang MEEN, National Formosa University, TAIWAN

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

#### Mathematics Education

Chunxia QI, Beijing Normal University, CHINA

Der-Ching YANG, National Chiayi University, TAIWAN

Joohi LEE, University of Texas at Arlington, USA

Lianghuo FAN, University of Southampton, UNITED KINGDOM & East China Normal University, CHINA

Kwok Cheung CHEUNG, University of Macau, MACAU

Mei-Shiu CHIU, National Chengchi University, TAIWAN

Oh Nam KWON, Seoul National University, SOUTH KOREA

Sandra NITE, Texas A&M University, USA

#### Science Education

Hayat HOKAYEM, Texas Christian University, USA

Jan Alexis NIELSEN, University of Copenhagen, DENMARK

Jana FANCOVICOVA, University of Trnava, SLOVAKIA

Jing LIN, Beijing Normal University, CHINA

Mariusz PANCZYK, Medical University of Warsaw, POLAND

Milan KUBIATKO, Jan Evangelista Purkyně University, CZECH REPUBLIC

Onofrio Rosario BATTAGLIA, University of Palermo, ITALY

Ozcan GULACAR, University of California, Davis, USA

Sarantos PSYCHARIS, School of Pedagogical and Technological Education, GREECE

Silvija MARKIC, University of Education Ludwigsburg, GERMANY

Vanda JANSTOVA, Charles University, Prague, CZECH REPUBLIC

### **STEM Education**

Eila JERONEN, University of Oulu, FINLAND

Federica VALLONE, University of Naples Federico II, Naples, ITALY

### **Technology Education**

M. Shane TUTWITER, University of Rhode Island, USA

Tzu-Hua WANG, National Tsing Hua University, TAIWAN

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

Zacharia ZACHARIAS, University of Cyprus, CYPRUS

### **Editorial Board Members**

Agustin ADÚRIZ-BRAVO, Universidad de Buenos Aires, ARGENTINA

Alipasa AYAS, Bilkent University, TURKEY

Anjum HALAI, Aga Khan University, PAKISTAN

Anna Maria GRUGNETTI, University of Pavia, ITALY

Carlos HERVÁS-GÓMEZ, University of Seville, SPAIN

Charis VOUTSINA, University of Southampton, UNITED KINGDOM

Chin-Chung TSAI, National Chiao Tung University, TAIWAN

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

Do-Yong PARK, Illinois State University, USA

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

Gert KADUNZ, University of Klagenfurt, AUSTRIA

Gregory J. KELLY, The Pennsylvania State University, USA

Gurol IRZIK, Sabanci University, TURKEY

Ingo EILKS, University of Bremen, GERMANY

Jan H. VAN DRIEL, University of Melbourne, AUSTRALIA

Jari LAVONEN, University of Helsinki, FINLAND

Kamisah OSMAN, Universiti Kebangsaan Malaysia, MALAYSIA

Kenneth TOBIN, The Graduate Center of CUNY, USA

Kyriacos ATHANASIOU, National and Kapodistrian University of Athens, GREECE

Lung Hsiang WONG, Nanyang Technological University, SINGAPORE

Lyn ENGLISH, Queensland University of Technology, AUSTRALIA

Lynn A. BRYAN, Purdue University, USA

Mailizar MAILIZAR, Syiah Kuala University, INDONESIA

Marika KAPANADZE, Ilia State University, GEORGIA

Martin RUSEK, Charles University, CZECH REPUBLIC

Michael ALLEN, Kingston University, UK

Monika Szczygieł, Pedagogical University of Krakow, POLAND

Nélio BIZZO, Universidade de São Paulo, BRAZIL

Pavol PROKOP, Comenius University Bratislava, SLOVAKIA

Paul PACE, University of Malta, MALTA

Pernilla NILSSON, Halmstad University, SWEDEN

Peter C. CORMAS, California University of Pennsylvania, USA

Rachel MAMLOK-NAAMAN, Weizmann Institute of Science, ISRAEL

Rohaida Mohd. SAAT, University of Malaya, MALAYSIA

Rolf V. OLSEN, University of Oslo, NORWAY

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

Sarika KEWALRAMANI, Monash University, AUSTRALIA

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

Uwe GELLERT, Freie Berlin University, GERMANY

Vanessa KIND, Durham University, UK

Vincentas LAMANAUSKAS, University of Siauliai, LITHUANIA



---

## CONTENTS

---

<b>How to teach philosophy of science to science students</b>	em2625
<i>Mansoor Niaz</i>	
<a href="https://doi.org/10.29333/ejmste/16255">https://doi.org/10.29333/ejmste/16255</a>	
<b>Exploring special non-cognitive factors related to young students' academic performance in STEM subjects</b>	em2626
<i>Nora Pataky, Ágnes Hőgye-Nagy, Tímea Olajos</i>	
<a href="https://doi.org/10.29333/ejmste/16254">https://doi.org/10.29333/ejmste/16254</a>	
<b>Derivative in Indonesian textbook curricula: A praxeological analysis of learning obstacles in Indonesian mathematics textbooks</b>	em2627
<i>Fitriana Eka Chandra, Didi Suryadi, Jarnawi Afgani Dahlan, Silfia Hayuningrat, Sindy Rahman</i>	
<a href="https://doi.org/10.29333/ejmste/16256">https://doi.org/10.29333/ejmste/16256</a>	
<b>The role of inquiry learning in enhancing creativity generating ideas from a self-efficacy perspective</b>	em2628
<i>Eka Frima Asda, I Wayan Dasna, Parlan Parlan, Suharti Suharti</i>	
<a href="https://doi.org/10.29333/ejmste/16276">https://doi.org/10.29333/ejmste/16276</a>	
<b>Lesson study in primary initial teacher education: Participants' perspectives on potential and challenges</b>	em2629
<i>Linda Cardoso, João Pedro da Ponte, Marisa Quaresma</i>	
<a href="https://doi.org/10.29333/ejmste/16306">https://doi.org/10.29333/ejmste/16306</a>	
<b>AI artifacts in the mathematics didactical tetrahedron: A developed model</b>	em2630
<i>Joseph Mani, Chia Zargeh</i>	
<a href="https://doi.org/10.29333/ejmste/16307">https://doi.org/10.29333/ejmste/16307</a>	
<b>Correction on From simulation to experiment: Using KiCad to design electric circuits in the physics classroom</b>	em2631
<i>Kosmas Dandl, Kristóf Tóth, Philipp Bitzenbauer</i>	
<a href="https://doi.org/10.29333/ejmste/16308">https://doi.org/10.29333/ejmste/16308</a>	
<b>Design of instruments for scientific creative thinking skills and creative thinking digital skills: Rasch models and confirmatory factor analysis</b>	em2632
<i>Firdaus Firdaus, Wiyanto Wiyanto, Ngurah Made Darma Putra, Wizi Isnaeni</i>	
<a href="https://doi.org/10.29333/ejmste/16310">https://doi.org/10.29333/ejmste/16310</a>	
<b>Life sciences learners' views on the integration of indigenous knowledge into indigenous knowledge-related topics using a cooperative learning approach: A case of South African grade 10 classroom</b>	em2633
<i>Thabelang Segopotse Sefoka, Karabo Justice Chuene</i>	
<a href="https://doi.org/10.29333/ejmste/16311">https://doi.org/10.29333/ejmste/16311</a>	

- |                                                                                                                                                                 |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Student engagement, conceptual-understanding, and problem-solving ability in learning plane geometry through an integrated instructional approach</b>        | em2634 |
| <i>Alemayehu Anbess Gebremeskel, Mulugeta Atnafu Ayele, Tadele Ejigu Wondimuneh</i>                                                                             |        |
| <a href="https://doi.org/10.29333/ejmste/16391">https://doi.org/10.29333/ejmste/16391</a>                                                                       |        |
| <b>Examining the relationship between mathematical literacy and digital literacy among pre-service mathematics teachers</b>                                     | em2635 |
| <i>Ahmad Yani T, Buyung Buyung, Rosmaiyadi Rosmaiyadi, Dina Anika Marhayani, Resy Nirawati, Susan Neni Triani, Soeharto Soeharto</i>                            |        |
| <a href="https://doi.org/10.29333/ejmste/16392">https://doi.org/10.29333/ejmste/16392</a>                                                                       |        |
| <b>Primary school teachers and their engagement with critical mathematics education via landscapes of investigation</b>                                         | em2636 |
| <i>Guilherme Henrique Gomes da Silva, João Pedro da Ponte</i>                                                                                                   |        |
| <a href="https://doi.org/10.29333/ejmste/16393">https://doi.org/10.29333/ejmste/16393</a>                                                                       |        |
| <b>Mapping the landscape: A bibliometric analysis of integrating STEM into science and mathematics classes</b>                                                  | em2637 |
| <i>Yousef Wardat, Ali Abdul Hadi Al-Omari, Omar M. Khasawneh, Hanadi G. Rawagah</i>                                                                             |        |
| <a href="https://doi.org/10.29333/ejmste/16394">https://doi.org/10.29333/ejmste/16394</a>                                                                       |        |
| <b>Photovoice as a visual-verbal strategy to develop student's representation and meta-representation skills in landscape education</b>                         | em2638 |
| <i>Chul-Ki Cho, Hyo-Jeong Kim, Wonseob Song</i>                                                                                                                 |        |
| <a href="https://doi.org/10.29333/ejmste/16395">https://doi.org/10.29333/ejmste/16395</a>                                                                       |        |
| <b>Interdisciplinary project based-inquiry: Empowering students to solve global problems</b>                                                                    | em2639 |
| <i>Erin E. Krupa, Margaret L. Borden, Hiller A. Spires, Marie Himes</i>                                                                                         |        |
| <a href="https://doi.org/10.29333/ejmste/16396">https://doi.org/10.29333/ejmste/16396</a>                                                                       |        |
| <b>Navigating linguistic transitions: Pre-service science and math teachers' perspectives on English as a medium of instruction in professional preparation</b> | em2640 |
| <i>Mohamed A. Shahat, Fatma Al-Busaidi, Mohammed Al-Ghafri, Khalsa Al Bahri</i>                                                                                 |        |
| <a href="https://doi.org/10.29333/ejmste/16397">https://doi.org/10.29333/ejmste/16397</a>                                                                       |        |
| <b>Impacts and challenges of mathematical modelling activities on students' learning development: A systematic literature review</b>                            | em2641 |
| <i>Aslipah Tasarib, Roslinda Rosli, Azmin Sham Rambely</i>                                                                                                      |        |
| <a href="https://doi.org/10.29333/ejmste/16398">https://doi.org/10.29333/ejmste/16398</a>                                                                       |        |