

ISSN: 2301-251X

EUROPEAN JOURNAL OF SCIENCE AND MATHEMATICS EDUCATION



October 2022
Volume 10
Issue 4

This page is intentionally left blank



Bastas

**EUROPEAN JOURNAL OF SCIENCE AND
MATHEMATICS EDUCATION**

Volume 10

Issue 4

October 2022

European Journal of Science and Mathematics Education

ISSN: 2301-251X (Online)

Web: <https://www.scimath.net/>

Publisher: Bastas

Copyright and Licensing: Authors retain the copyright of their articles and have full control over their own published scholarly work. Authors are not asked to transfer copyrights to Bastas. This allows the scientific community to have free and immediate access to the content as soon as the work is published online.

Authors grant Bastas the right of first publication and dissemination of the articles. As the original publisher, Bastas publishes articles under a permissive [Creative Commons Attribution License \(CC BY 4.0\)](#), which allows third parties to distribute, remix or build upon the work, even commercially, as long as they credit the authors for original article.

EUROPEAN JOURNAL OF SCIENCE AND MATHEMATICS EDUCATION

The **European Journal of Science and Mathematics Education** aims to stimulate discussions on contemporary topics in science and mathematics education and to foster the application of the results in primary, secondary, and higher education in the countries of Europe and other countries. The journal is open-access, peer-reviewed and published quarterly.

AIMS AND SCOPE

The **European Journal of Science and Mathematics Education** is founded to stimulate discussions on contemporary topics in Science and Mathematics Education and to foster the application of the results in primary, secondary, and higher education. The Journal is a platform for exchange of original ideas with particular emphasis on application. We welcome empirical and theoretical research papers, as well as papers on innovation of teaching techniques and technologies, and position papers.

ABSTRACTING AND INDEXING

European Journal of Science and Mathematics Education (EJSME) is listed by the following indexes, databases, directories, or libraries.

ERIC

ERIH

EBSCO

Google Scholar

SCOPUS

Sherpa Romeo

EDITORIAL BOARD

Editors

Kamisah Osman, The National University of Malaysia, Malaysia

SCOPUS ID: 26656915400

Milan Kubiak, J. E. Purkyne University, Faculty of Education

Department of Preschool and Primary Education

Pasteurova 1, 400 96 Usti nad Labem, Czech Republic

SCOPUS ID: 18037477400

Editorial Board

Dominique Persano Adorno, University of Palermo, Italy

Maija Aksela, University of Helsinki, Finland

Patricia Bagget, New Mexico State University, USA

George Bodner, Purdue University, USA

Ubiratan D'Ambrosio, UNICAMP, São Paulo, Brazil

Bruno D'Amore, University of Bologna, Italy

Philipp Bitzenbauer, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Jean-Luc Dorier, University of Geneva, Switzerland

Sibel Erduran, University of Oxford, UK

Lianghuo Fan, University of Southampton, UK

Markus Sebastian Feser, Universität Hamburg, Germany

Gabriele Kaiser, University of Hamburg, Germany

Berinderjeet Kaur, National Institute of Education, Singapore

Jari Lavonen, University of Helsinki, Finland

Cedric Linder, Uppsala University, Sweden

Yu-Ling Lu, National Taipei University of Education, Taiwan

Nicolina A. Malara, Università degli Studi di Modena e Reggio Emilia, Italy

Cheryl Mason, San Diego State University, USA

João Filipe de Matos, University of Lisbon, Portugal

Immaculate Kizito Namukasa, University of Western Ontario, Canada

Edward Redish, University of Maryland, USA

Rohaida Mohd. Saat, University of Malaya, Malaysia

Ali Simsek, Anadolu University, Turkey

Josip Slisko, Autonomous University of Puebla, Mexico

Verena Spatz, Technische Universität Darmstadt, Germany

Heinz Steinbring, University of Duisburg-Essen, Germany

Behiye Ubuz, Middle East Technical University, Turkey

Muhammet Usak, Kazan Federal University, Russia

Anne Watson, University of Oxford, UK

Dean Zollman, Kansas State University, USA

Executive Editor

Muhammet Usak, Kazan Federal University, Kazan, Russian Federation

SCOPUS ID: 23010777700

Past Editors and Editorial Board Members

Ayhan Bilsel, Founding Editor-in Chief (2013-2020)

Fahme Dabaj, Co-Editor (2013-2020)

Mehmet Garip, Co-Editor (2013-2020)

David Hestenes (2013-2020)

Norman Lederman (2013-2020)

Lillian McDermott (2013-2020)

Keith Taber (2013-2020)

Carl Winslow (2013-2020)

Kewen Zhao (2013-2020)

Jean-Philippe Drouhard (2013-2015)

CONTENTS

Volume 10 – Issue 4 – October 2022

Research Article		
How Physics Courses Can Make Highly Valued Strategies and Dispositions Visible to Physics Teacher Students	396-411	
<i>Susanne Engström, Per Norström</i>		
https://doi.org/10.30935/scimath/12078		
Research Article		
Investigating Pre-Service Teachers' Beliefs Towards Mathematics: A Case Study	412-435	
<i>Bhesh Mainali</i>		
https://doi.org/10.30935/scimath/12103		
Research Article		
Student Interest and Engagement in Mathematics After the First Year of Secondary Education	436-454	
<i>Veronica Ryan, Olivia Fitzmaurice, John O'Donoghue</i>		
https://doi.org/10.30935/scimath/12180		
Research Article		
Development of an Item Bank for Measuring Students' Conceptual Understanding of Real Functions	455-470	
<i>Anela Hrnjičić, Adis Alihodžić, Fikret Čunjalo, Dina Kamber Hamzić</i>		
https://doi.org/10.30935/scimath/12222		
Research Article		
Pre-Service Mathematics Teachers' Web of Knowledge Recalled for Mathematically Rich and Contextually Realistic Problems	471-494	
<i>Serife Sevinc, Richard Lesh</i>		
https://doi.org/10.30935/scimath/12250		
Research Article		
Using Alternative Ideas for Determining the Learning Curve on the Concept of Force	495-506	
<i>Konstantinos T. Kotsis, Dimitris Panagou</i>		
https://doi.org/10.30935/scimath/12251		
Research Article		
A Mixed-Method Approach to Investigate the Effect of Flipped Inquiry-Based Learning on Chemistry Students Learning	507-518	
<i>Benjamin Aidoo, Christian Anthony-Krueger, Alexander Obiri Gyampoh Gyampoh, Johnson Tsyawo, Francis Quansah</i>		
https://doi.org/10.30935/scimath/12339		

Research Article	Environmental Literacy of ISCED 2 Pupils in the Czech Republic and Slovakia	519-528
	<i>Silvie Svobodová, Roman Kroufek</i>	
	https://doi.org/10.30935/scimath/12361	
Research Article	An Inquiry Perspective on Statistics in Lower Secondary School in Denmark and Japan-An Elaboration and Modelling of the Anthropological Theory of the Didactic Through Two Statistics Classrooms	529-546
	<i>Camilla Hellsten Østergaard</i>	
	https://doi.org/10.30935/scimath/12401	
Research Article	Parents' Influence on Children Mathematical Activity During Lockdown	547-554
	<i>Andrea Maffia</i>	
	https://doi.org/10.30935/scimath/12402	
Research Article	Mathematical Modelling in Upper Primary School: Finding Relevance and Value for Others Outside School	555-569
	<i>Frode Olav Haara</i>	
	https://doi.org/10.30935/scimath/12403	