ISSN: 1305-8223

# EURASIA JOURNAL OF MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION



#### 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

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

February 2025 Volume 21 Issue 2



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**. 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
- PSYNDEX
- 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

Topologic ConstraintConstraintTacolience van Wijk, Rogier Bos, Anna Shvarts, Michiel Doormanhttps://doi.org/10.29333/ejmste/15911Colombian pre-service mathematics teachers' knowledge and didacticMauricio Pablo Gómez-Muñoz, Camilo Andrés Rodríguez-Nieto, Adolfo PimientaAcosta, Adriana Bredahttps://doi.org/10.29333/ejmste/15912Teaching creativity through mathematical lateral thinking problems: A pilotstudyLukman Jakfar Shodiq, Dwi Juniati, Susanahhttps://doi.org/10.29333/ejmste/15913Teachers' perceptions: What happened after more than 10 years ofdeveloping the mathematics textbookEssa A. Alibraheimhttps://doi.org/10.29333/ejmste/15914AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómezhttps://doi.org/10.29333/ejmste/15915A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916Motivational factors for visually impaired college students in learning data analyticsSulima Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schoolsMbalenhik Negma, Abraham Motilhabane https://doi.org/10.2933/ejmste/15925	Mathematics teachers' professional experimentation with mathematical origami in secondary education	em2572
https://doi.org/10.29333/ejmste/15911       em2573         Colombian pre-service mathematics teachers' knowledge and didactic suitability in the context of the measurement       em2573         Mauricio Pablo Gómez-Muñoz, Camilo Andrés Rodríguez-Nieto, Adolfo Pimienta Acosta, Adriana Breda       em2574         https://doi.org/10.29333/ejmste/15912       em2574         Teaching creativity through mathematical lateral thinking problems: A pilot study       em2574         Lukman Jakfar Shodiq, Dwi Juniati, Susanah       em2575         Https://doi.org/10.29333/ejmste/15913       em2575         Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbook       em2576         Essa A. Alibraheim       https://doi.org/10.29333/ejmste/15914         AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)       em2576         Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez       em2577         https://doi.org/10.2933/ejmste/15915       A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024       em2578         Hardian Mei Fajri, Arita Marini, Suyono       https://doi.org/10.2933/ejmste/15916       em2578         Motivational factors for visually impaired college students in learning data analytics       em2578         Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan       https://doi.org/10.2933/ejmste/15		
suitability in the context of the measurement Mauricio Pablo Gómez-Muñoz, Camilo Andrés Rodríguez-Nieto, Adolfo Pimienta Acosta, Adriana Breda https://doi.org/10.29333/ejmste/15912 Teaching creativity through mathematical lateral thinking problems: A pilot study Lukman Jakfar Shodiq, Dwi Juniati, Susanah https://doi.org/10.29333/ejmste/15913 Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbook Essa A. Alibraheim https://doi.org/10.29333/ejmste/15914 AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024) Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez https://doi.org/10.29333/ejmste/15915 A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	https://doi.org/10.29333/ejmste/15911	
Acosta, Adriana Breda       https://doi.org/10.29333/ejmste/15912         Teaching creativity through mathematical lateral thinking problems: A pilot study       em2574         Lukman Jakfar Shodiq, Dwi Juniati, Susanah       https://doi.org/10.29333/ejmste/15913       em2575         Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbook       em2575         Essa A. Alibraheim       https://doi.org/10.29333/ejmste/15914       em2576         AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)       em2576         Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez       em2577         https://doi.org/10.29333/ejmste/15915       em2577         A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024       em2578         Hardian Mei Fajri, Arita Marini, Suyono       https://doi.org/10.29333/ejmste/15916       em2578         Motivational factors for visually impaired college students in learning data analytics       em2578         Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan       em2579         Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools       em2579	-	em2573
Teaching creativity through mathematical lateral thinking problems: A pilot studyem2574Teaching creativity through mathematical lateral thinking problems: A pilot studyem2574Lukman Jakfar Shodiq, Dwi Juniati, Susanah https://doi.org/10.29333/ejmste/15913Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbookEssa A. Alibraheim https://doi.org/10.29333/ejmste/15914Ali in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómezhttps://doi.org/10.29333/ejmste/15915A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916em2578Motivational factors for visually impaired college students in learning data analyticsem2578Sulinan Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.2933/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabaneem2579		
study Lukman Jakfar Shodiq, Dwi Juniati, Susanah https://doi.org/10.29333/ejmste/15913 Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbook Essa A. Alibraheim https://doi.org/10.29333/ejmste/15914 AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024) Hassan Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez https://doi.org/10.29333/ejmste/15915 A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in em2579 elected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	https://doi.org/10.29333/ejmste/15912	
https://doi.org/10.29333/ejmste/15913Teachers' perceptions: What happened after more than 10 years of developing the mathematics textbookem2575Essa A. Alibraheim https://doi.org/10.29333/ejmste/15914em2576AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024) Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez https://doi.org/10.29333/ejmste/15915em2577A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916em2578Motivational factors for visually impaired college students in learning data analyticsem2578Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham MotIhabaneem2579		em2574
Teachers' perceptions: What happened after more than 10 years of       em2575         developing the mathematics textbook       em2575         Essa A. Alibraheim       https://doi.org/10.29333/ejmste/15914         AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)       em2576         Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez       em2577         https://doi.org/10.29333/ejmste/15915       em2577         A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024       em2577         Hardian Mei Fajri, Arita Marini, Suyono       https://doi.org/10.29333/ejmste/15916       em2578         Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan       https://doi.org/10.29333/ejmste/15923       em2579         Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools       em2579	Lukman Jakfar Shodiq, Dwi Juniati, Susanah	
developing the mathematics textbook         Essa A. Alibraheim         https://doi.org/10.29333/ejmste/15914         AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)         Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómez         https://doi.org/10.29333/ejmste/15915         A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024         Hardian Mei Fajri, Arita Marini, Suyono         https://doi.org/10.29333/ejmste/15916         Motivational factors for visually impaired college students in learning data analytics         Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan         https://doi.org/10.29333/ejmste/15923         Virtual labs in life sciences education: A case study of grade 10 learners in em2579         selected South African rural schools         Mbalenhle Ngema, Abraham Motlhabane	https://doi.org/10.29333/ejmste/15913	
https://doi.org/10.29333/ejmste/15914AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)em2576Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómezem2577https://doi.org/10.29333/ejmste/15915em2577A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024em2577Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916em2578Motivational factors for visually impaired college students in learning data analyticsem2578Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabaneem2579		em2575
AI in mathematics education: A bibliometric analysis of global trends and collaborations (2020-2024)em2576Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómezem2577https://doi.org/10.29333/ejmste/15915em2577A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916em2578Motivational factors for visually impaired college students in learning data analyticsem2578Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabaneem2579	Essa A. Alibraheim	
collaborations (2020-2024)Hassan Hossein-Mohand, Hossein Hossein-Mohand, Veronica Albanese, María del Carmen Olmos Gómezhttps://doi.org/10.29333/ejmste/15915A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916Motivational factors for visually impaired college students in learning data analyticsSuliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	https://doi.org/10.29333/ejmste/15914	
Carmen Olmos Gómezhttps://doi.org/10.29333/ejmste/15915A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024Hardian Mei Fajri, Arita Marini, Suyonohttps://doi.org/10.29333/ejmste/15916Motivational factors for visually impaired college students in learning data analyticsSuliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane		em2576
A bibliometric study on mathematical modelling in elementary schools in the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916em2577Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923em2578Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabaneem2579		
the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data em2578 analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in em2579 selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	https://doi.org/10.29333/ejmste/15915	
https://doi.org/10.29333/ejmste/15916Motivational factors for visually impaired college students in learning dataem2578analyticsem2578Suliman Abdalla, Amjad Alhaj, Elnazir Ramadanem2579https://doi.org/10.29333/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools Mbalenhle Ngema, Abraham Motlhabaneem2579		
Motivational factors for visually impaired college students in learning dataem2578analyticsSuliman Abdalla, Amjad Alhaj, Elnazir Ramadanhttps://doi.org/10.29333/ejmste/15923https://doi.org/10.29333/ejmste/15923em2579Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schoolsem2579Mbalenhle Ngema, Abraham MotlhabaneMotlhabane		em2577
analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in em2579 selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	the Scopus database between 1990-2024	em2577
https://doi.org/10.29333/ejmste/15923         Virtual labs in life sciences education: A case study of grade 10 learners in       em2579         selected South African rural schools       Mbalenhle Ngema, Abraham Motlhabane	<b>the Scopus database between 1990-2024</b> Hardian Mei Fajri, Arita Marini, Suyono	em2577
Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools       em2579         Mbalenhle Ngema, Abraham Motlhabane       em2579	the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data	
selected South African rural schools Mbalenhle Ngema, Abraham Motlhabane	the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics	
	the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan	
https://doi.org/10.29333/ejmste/15925	the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in	em2578
	the Scopus database between 1990-2024 Hardian Mei Fajri, Arita Marini, Suyono https://doi.org/10.29333/ejmste/15916 Motivational factors for visually impaired college students in learning data analytics Suliman Abdalla, Amjad Alhaj, Elnazir Ramadan https://doi.org/10.29333/ejmste/15923 Virtual labs in life sciences education: A case study of grade 10 learners in selected South African rural schools	em2578

The effect of employing project-web learning approach in teaching mathematics instruction methods course on developing the mind habits	em2580
among Dhofar University students	
Abdelkader Elsayed, Yousef Wardat, Mohammed Alawaed, Youssef Albaraami	
https://doi.org/10.29333/ejmste/15930	
The contribution of critical thinking skills in rich mathematical problem completion: Insights from pre-service mathematics teachers	em2581
Agustiani Putri, Toto Nusantara, Purwanto, Abdur Rahman As'ari	
https://doi.org/10.29333/ejmste/15931	
Evaluating artificial intelligence large language models' performances in a South African high school chemistry exam Samuel Jere	em2582
https://doi.org/10.29333/ejmste/15932	
Bibliometric analysis of pedagogical content knowledge: Countries, authors, and fields of knowledge	em2583
David Santibáñez, Alejandro Vega, Hernán Cofré, Natalia Salas, José Adsuar	
https://doi.org/10.29333/ejmste/15953	
Unlocking Indonesian primary students' attitudes toward STEM education and interests in STEM-related careers using latent profile analysis Marison Sudianto Manalu, Chun-Yen Chang https://doi.org/10.29333/ejmste/15954	em2584
Active learning in engineering education: Insights from a faculty development program in higher education	em2585
Angeles Dominguez, Maria Elena Truyol, Monica Quezada-Espinoza, Juan Felipe Calderon, Genaro Zavala	
https://doi.org/10.29333/ejmste/15955	
Learning engagement as moderator between self-efficacy, math anxiety, use of diagrams, and complex plane problem-solving Yuno Shimizu	em2586
https://doi.org/10.29333/ejmste/15956	
Exploring university students' misconceptions of the kinetic molecular theory of gases: A study from Kazakhstan	em2587
Bexultan Orazov, Gulnara Issayeva, Samat Maxutov, Elmira Kozhabekova, Nuri Balta	
https://doi.org/10.29333/ejmste/15957	
In-service mathematics teachers' perceptions of GeoGebra integrative training materials: The case of geometry teaching	em2588
Israel Yeukai Marange, Benjamin Tatira	
https://doi.org/10.29333/ejmste/15958	

https://doi.org/10.29333/ejmste/15958

## Effectiveness of Cabri II Plus software in enhancing academic achievementem2589and motivation in learning right triangles and Pythagorean theorem amongsecond-grade middle school students

Abdellah En-nhiri, Mourad Radi, Khadija Dahmani, Nordine Er-rahmany, Rachid Touir, Rachid Echarghaoui, Mouhsine Galai, Hayat Larhzil https://doi.org/10.29333/ejmste/15952