Welcome to SIMIODE EXPO 2024

9 - 11 February 2024

Brian Winkel, Director SIMIODE, Chardon OH USA

Welcome Back

We hope Days 1 and 2 of EXPO 2024 proved

interesting, worthwhile, useful, and enjoyable.

Lots more to come today . . .

- Please respond to conference survey
  you will receive after conference, thank you.
- Presentation and Discussion on Insight Maker software
- Applications of differential equations
- Factoring method to motivate DE solutions - way cool
- Classroom activities
- Cancellation 5:00 PM "Investigating DE in Control Theory"
- Last sessions of the day 5:30 - 5:55 PM Good Stuff

Comments

- Slightly trimmed recordings of your video are available under "Watch Recording" button to the right of each recorded session. These are ONLY available to conference attendees. We will be collecting and posting on SIMIODE YouTube channel all conference presentations, NOT discussion sessions.
- Again, we will ask you to help us learn more about what you liked (and did not like) about the conference and how we can improve through a Survey at the end of the Conference.
- Please enjoy the sessions today!

ABSTRACT

Mathematical modelling is an interlinking process between mathematics and real-world problems that can be applied as a means to increase motivation, develop cognitive competencies, and enhance the ability to transfer mathematical knowledge to other areas of science, such as engineering disciplines. This study was designed to investigate the effect of applying the modelling approach on problem-solving and mathematical performance of engineering undergraduates during a differential equations (DEs) course and compare the results with those of conventional teaching. A quasi-experimental method comprising a pretest-posttest design with a control group was applied in this study. Since the antecedent knowledge of calculus directly influences the ability of students to learn DEs, a placement test was first applied to both groups. A combination of results derived from the placement test and the modelling pretest was used as the covariate in the Analysis of Covariance (ANCOVA), and the modelling and mathematical performances of both groups were eventually examined. The results of this study indicate that apart from the fact that teaching DEs based on the modelling approach can increase the ability to apply mathematical knowledge in the field of engineering, it also can significantly enhance their problem-solving and mathematical performances.

both groups were eventually examined. The results of this study indicate that apart from the fact that teaching DEs based on the modelling approach can increase the ability to apply mathematical knowledge in the field of engineering, it also can significantly enhance their problem-solving and mathematical performances.

INTERNATIONAL JOURNAL OF MATHEMATICAL EDUCATION IN SCIENCE AND TECHNOLOGY
https://doi.org/10.1080/0020739X.2024.2307397

Teaching differential equations through a mathematical modelling approach: the impact on problem-solving and the mathematical performance of engineering undergraduates

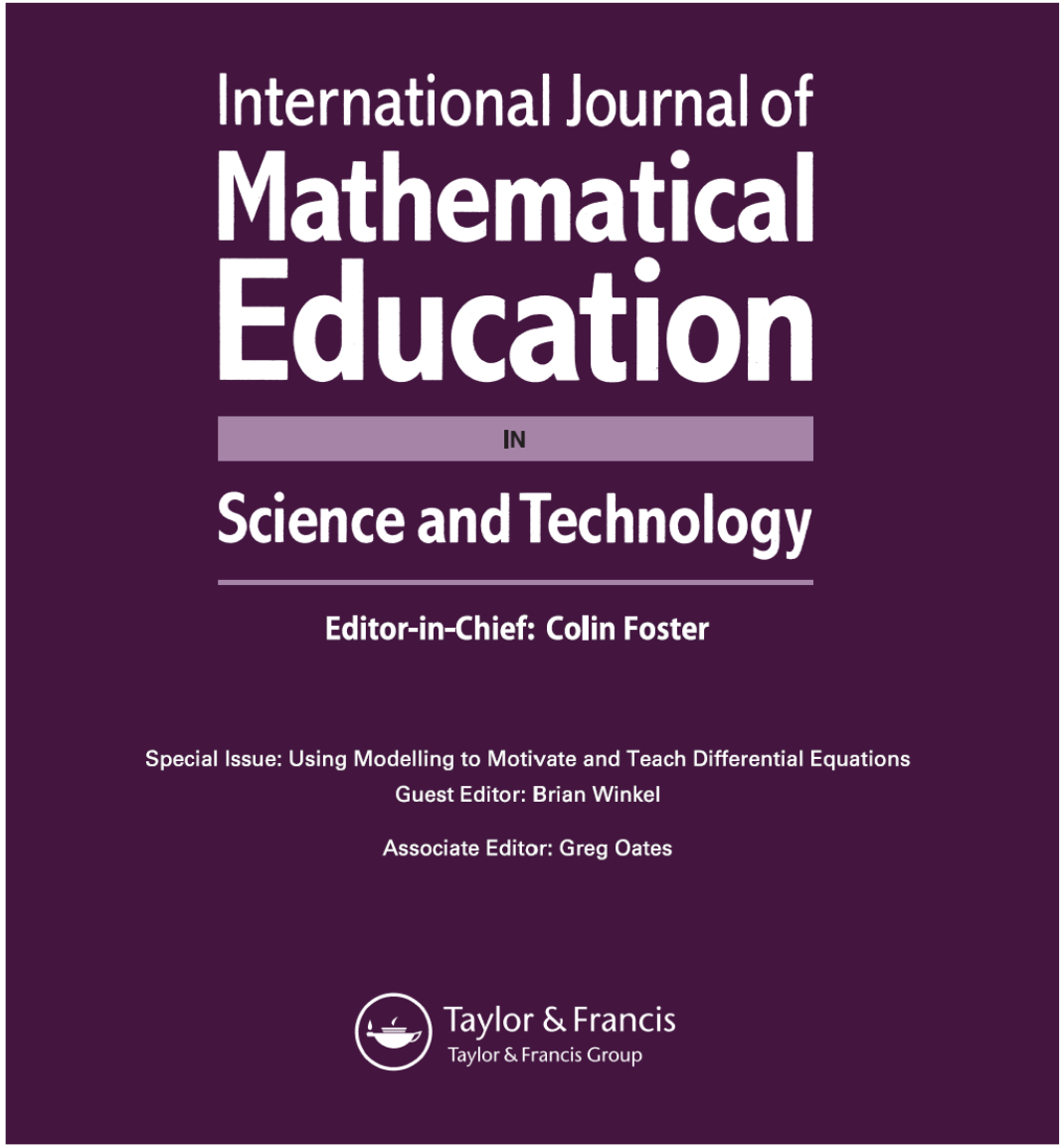
Jaleh Rezaei[a] and Nasim Asghary [b]

[a]Department of Mathematics, Science and Research Branch, Islamic Azad University, Tehran, Iran;
[b]Department of Mathematics & Computer Science, Central Tehran Branch, Islamic Azad University, Tehran, Iran

ISSN 0020-739X

Volume 55
Number 2
February 2024

IJMEST



Special Issue: Using Modelling to Motivate and Teach Differential Equations

Guest Editor: Brian Winkel

- Greg Oates, Associate Editor for Special Issues, University of Tasmania, Hobart, Australia
- Brian Winkel, Director, SIMIODE, Chardon, OH, USA – Lead Editor
- Maila Hallare, Mathematical Sciences, United States Air Force Academy, USAFA, CO, USA
- Brody Johnson, Mathematics and Statistics, Saint Louis University, St. Louis, MO, USA
- Glenn Ledder, Mathematics, Emeritus, University of Nebraska, Lincoln, NE, USA
- Yanping Ma, Mathematics, Loyola Marymount University, Los Angeles, CA, USA
- Mark Nelson, School of Mathematics and Applied Statistics, University of Wollongong, Wollongong, NSW, Australia
- Cheryl Potocki, Mathematics, Retired, Charter School of Wilmington, Wilmington, DE, USA
- Becky Sanft, Mathematics, University of North Carolina Asheville, Asheville, NC, USA

396 page packed issue, 24 articles, all about teaching differential equations with mode**ll**ing!

Free at MAA Portal for Members. Check your library offerings.

Special thanks to the conference team planners, organizers, and moderators.

- Anna Salam, Graduate Student, Tufts University, Medford MA USA
- Betram Lalush, Undergraduate Student, Loyola Marymount University, Los Angeles CA USA
- Gavin Butts, Undergraduate Student, Loyola Marymount University, Los Angeles CA USA
- Leigh Noble, Technical Director SIMIODE, Winnipeg MB CANADA
- Yanping Ma, Associate Professor of Mathematics, Loyola Marymount University, Los Angeles CA USA
- Brian Winkel, Director SIMiODE, Chardon OH USA

We turn to Dr. Leigh Noble, Technical Director SIMIODE, for words about conference and technology.