ICTMA Newsletter

Volume 12 Number 1 May 2025

Dear ICTMA friends...

This first ICTMA Newsletter of 2025 contains news from the field of mathematical modelling at an international level. This newsletter contains a list of selected recent publications by ICMTA members in journals and books in our field as well as recently completed dissertations. We would like to thank all colleagues who have contributed to this newsletter with their comments and texts. We also welcome contributions for the next newsletter with details of publications, projects, dissertations and news.

Gilbert Greefrath

News

ICTMA22 in Linköping, Sweden, August 10-15, 2025 – Update from the Local Organizing Committee

We are thrilled to share that ICTMA22 has received over **170 abstract submissions** from researchers and educators around the world, and the **program is going to be rich and varied**, reflecting the global diversity and innovation in mathematical modelling education.

🔔 **Important reminders:**

- **Hotel bookings:** Pre-booked rooms are only available for a limited time. We strongly encourage participants to secure their accommodation as soon as possible, before these rooms are released to the public. Booked rooms can be cancelled free of charge on the same day as arrival before 6 pm—so book now to secure your room! Use the promotional code and links found on the ICTMA22 website.
- **Registration is open!** Take advantage of the current rates—**registration fees increase after June 15**.

We warmly welcome all participants and look forward to insightful discussions, networking, and a memorable conference experience in Linköping!

Visit the conference website for details and updates:

https://liu.se/en/research/ictma22

Contact us: ICTMA22@mai.liu.se

The ICTMA22 Local Organizing Committee

ICTMA22-Early Career Research Day – Sunday August 10, 2025

Dear early career researchers,

We cordially invite you to the Early Career Researcher Day, which will take place as part of the ICTMA22 conference on Sunday, 10 August. The afternoon offers you the opportunity to exchange ideas with each other and with experienced researchers, to network and to gain valuable impulses for your further academic career.

The programme begins with a lunch together in a relaxed atmosphere, where we will get to know each other and present our research projects in short presentations (3-5 minutes). Afterwards, you can expect a series of interactive workshops on various topics related to academic work and research - including tips on career planning, insights into research approaches such as observing modelling processes in the classroom, suggestions for academic writing and an introduction to the history and theories of the ICTMA community.

The day will be accompanied by proven experts, including Prof. Dr Vince Geiger, Prof. Dr Peter Galbraith and Ass. Prof. Lisa Steffensen. Prof. Dr Pauline Vos will lead the event.




Finally, you are cordially invited to join all ICTMA22 participants at the official Welcome Reception.
Prof. Dr. Pauline Vos and the organisation team are looking forward to an inspiring exchange with you - bring your ideas, questions and curiosity!

ZDM Special Issue "International Perspectives on Mathematical Modelling" and Webinar

This new special issue, edited by Stanislaw Schukajlow, Janina Krawitz, Xinrong Yang, and Vince Geiger, brings together international perspectives on mathematical modelling, reflecting the diversity of goals, traditions, and understandings across countries and research cultures. The issue features contributions from researchers around the world, offering insights through diverse methodologies and educational contexts, and aims to foster deeper international dialogue on modelling in mathematics education. The special issue "International Perspectives on Mathematical Modelling" will be published this week on the ZDM homepage. We warmly invite ICTMA members to join the upcoming ZDM webinar based on this special issue.

🌍 **Webinar:** International Perspectives on Mathematical Modelling
ZDM – Mathematics Education, Issue 2/3 in 2025
Edited by: Stanislaw Schukajlow, Janina Krawitz, Xinrong Yang & Vince Geiger
📅 *Date: Thursday, 26 June 2025*
🕒 *Time: 10:00–11:30 UTC | 12:00–13:30 CEST*
🔗 Zoom Link:
https://uni-ms.zoom-x.de/j/68066300058?pwd=VrThbt4eQMhYQLqFXteFR623zbMJ5A.1
Meeting-ID: 680 6630 0058
Kenncode: 819969

🧭 Schedule
Introduction & Moderation: Stanislaw Schukajlow
Short Presentations with Audience Discussion:

1. A Systematic Review of International Perspectives on Mathematical Modelling: Modelling Goals and Task Characteristics
   – Janina Krawitz, Stanislaw Schukajlow, Xinrong Yang, Vince Geiger
2. Identifying and Describing Generic, Specific, and Catalytic Enablers of Mathematical Modelling
   – Vince Geiger, Peter Galbraith, Mogens Niss, Mirjam Schmid
3. Pre-Service Mathematics Teachers' Experiences and Insights into the Benefits and Challenges of Using Explanatory Videos in Flipped Modelling Education
   – Mustafa Cevikbas, Denise Mießeler, Gabriele Kaiser

Stanislaw Schukajlow

Spanish Modelling challenge

The *Spanish modelling challenge (IMMC-Spain)* has been successfully completed between November 2024 to April 205. A total of 38 teams of students have participated

in the national selection phase, and the best 5 have been selected to solve the problem of the International Mathematical Modelling Challenge. The best 2 solutions have been submitted to the IM2C.
All the information about this Spanish mathematical modelling challenge is available on: https://immcspain.blogs.uv.es/

Irene Ferrando Palomares

New project STAMM@prim (Studies in Teaching Approaches for Mathematical Modelling at Primary Level)

A new project has been launched at the University of the Witwatersrand in Johannesburg, South Africa, at the start of 2025. This project, STAMM@prim, builds on the design and results from the CoSTAMM studies and the aim is to foster primary mathematics (grade 4 – 6) student teachers' mathematical and modelling competencies through an effective teaching design that contains an online learning component. Funding has been secured from the South African National Research Foundation (NRF) for the period 2025 - 2027.

Rina Durandt

Workshop: Leveraging Mathematical Modelling for Education and Action

The *workshop* entitled: Leveraging Mathematical Modelling for Education and Action, took place from May 11 to 16, 2025 in Oaxaca City, *Oaxaca, Mexico*, at Hotel Hacienda los Laureles, supported by Banff International Research Station for Mathematical Innovation and Discovery (BIRS) and the Casa Matemática Oaxaca (CMO).
This workshop was organized by Jesus Enrique Hernandez Zavaleta (Cape Breton University/Canada), Hyunyi Jung (Texas A&M University/USA), Tatiana María Mendoza von der Borch (Autonomous University of Queretaro/Mexico), Lauren DeDieu (University of Calgary/Canada), Corey Brady (Southern Methodist University/USA), and Armando Paulino Preciado Babb (University of Calgary/Canada).

As decided by the organizers, this workshop had a hybrid format meeting, with some people participating in-person in Oaxaca, and others invited to attend online, via Zoom and it was conducted as a bilingual workshop: English and Spanish languages.
The workshop explored critical and reflective topics, including social justice and mathematical modeling, ethnomodelling, environmental justice, and the intersection of AI and social justice.

Keynote speakers were Milton Rosa and Daniel Orey from the Universidade Federal de Ouro Preto, Brazil, who spoke about: Decolonizationn Reflections on the Connection between Ethnomathematics and Modelling through Ethnomdelling, who began the workshop theme outlining the differences and similarities between Global North and Global South and their specificities regarding modelling developed in distinct cultural contexts.
Other speakers were Hyunyi Jung (Culturally Sustaining Mathematical Modelling: its conceptualization and implementation), Magdalena Pando (Language, Mathematics and GenAI: Multilingual and Multimodal Pathways in Equity-Centered Education), Diana Violeta Solares Pineda (Conocimientos Matemáticas Extraescolares de Adultos No Alfabetizados o con Baja Escolaridad: El caso de Trabajadore(a)s Agrícolas Migrantes), Anthony Ware (Modelling the Impact of the Health Impact Fund).
The working groups met along the speaker themes and organized outlines for future collaboration in investigations and chapters for a possible book and articles for a journal special edition on the theme of culture, language, and mathematical modelling.

Milton Rosa and Daniel Clark Orey

Henry Pollak Award for Prof. Dr Gabriele Kaiser

Gabriele Kaiser will receive the Henry Pollak Award from the ICTMA this year. The ceremony will take place at the ICTMA22 conference in Linköping.
Prof. Dr Gabriele Kaiser is one of the most important international experts in the field of mathematical modelling education. She has significantly shaped the ICTMA. She was President of ICTMA twice (2007-2011, 2019-2023), organised ICTMA-14 in Hamburg in 2009 and has been co-editor of the ICTMA conference proceedings since 2017. She also heads the book series 'International Perspectives on the Teaching and Learning of Mathematical Modelling'. Gabriele Kaiser has made a decisive contribution to the theoretical foundation of modelling, for example through her work on modelling perspectives, competence models and teacher beliefs. Her high level of recognition is reflected in numerous publications. She has also supervised ten doctoral and post-doctoral theses in the field of modelling, as well as many others in other areas of mathematics education. We congratulate Gabriele Kaiser on this honour and will report on the ceremony in our next newsletter.

Master's theses:

Liat Cohen (supervised by Prof. Zehavit Kohen). Exploring best-instructional practices within mathematical modelling instruction. Graduated April 2023, Faculty of Education in Science and Technology, Israel Institute of Technology.

Hadas Handelman (supervised by Prof. Zehavit Kohen). Scaling up mathematical modelling instruction: investigating the impact of an effective professional development program for leading teachers. Graduated July 2023, Cum Laude, Faculty of Education in Science and Technology, Israel Institute of Technology.

Recent Dissertation

Laura Wirth (supervised by Gilbert Greefrath). Instructional videos on ill-structured mathematical problem-solving processes: The cases of mathematical modeling and proof construction (Reviewers: Gilbert Greefrath and Jennifer Czocher), January 2025, University of Muenster, Germany

Recent Publications

Barquero, B., & Ferrando, I. (2024). Teacher education for mathematical modelling: Exploring the experiences of secondary school teachers in two courses. *ZDM – Mathematics Education*, *56*(6), 1109–1122. https://doi.org/10.1007/s11858-024-01609-4

Borromeo Ferri, R. (2025). Mathematical Modelling as a key practice for promoting learners' competencies targeting the transformation of global sustainability. In K. Le Roux, A. Coles, A. Solares-Rojas, A. Bose, C. Vistro-Yu, P. Valero, N. Sinclair, M. Makramalla, R. Gutiérrez, V. Geiger, & M. C. Borba (Eds.), *Proceedings of the 27th ICMI Study Conference (Mathematics Education and the Socio-Ecological)* (pp. 284–291). MATHTED and ICMI.

Bulut, N., & Borromeo Ferri, R. (2025). Bridging Mathematical Modelling and Education for Sustainable Development in Pre-Service Primary Teacher Education. *Education Sciences*, *15*(2), 248. https://doi.org/10.3390/educsci15020248

Cai, J., Su, M., Hwang, S. (in press). Problem posing and mathematical modeling: A proposal for designing and conducting modeling research involving problem posing. *Journal for Research in Mathematics Education*. If anyone would like to have a copy of the paper, please let Jinfa Cai know (jcai@udel.edu).

Ferrando, I., Barquero, B., & Segura, C. (2025). Does training matter? Effect of training strategies on how pre-service teachers pose and assess modelling problems. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01658-3

Ikeda, T., Borromeo Ferri, R., & Kawakami, T. (2025). Factors influencing Japanese pre-service teachers' self-efficacy in teaching mathematical modelling. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01666-3

Kohen, Z. (2025). Structured mathematical modelling in an authentic scientific-engineering context. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01654-7

Krawitz, J., Schukajlow, S., Yang, X., & Geiger, V. (2025). A systematic review of international perspectives on mathematical modelling: Modelling goals and task characteristics. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01683-2

Lindl, A., Durandt, R., & Blum, W. (2025). Fostering Mathematical Modelling Competency in Different Learning Environments and Educational Contexts – an Exploratory Comparative Analysis of Four Intervention Studies. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01680-5

Quarder, J., Greefrath, G., Gerber, S., & Siller, H.-S. (2025). Pedagogical content knowledge for simulations and mathematical modelling with digital tools: A quasi-experimental

study with pre-service mathematics teachers. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01673-4

Segura, C., Gallart, C., & Ferrando, I. (2025). Influence of pre-service primary school teachers' prior knowledge of measurement and measurement estimation in solving modelling problems. *Journal of Mathematics Teacher Education*. https://doi.org/10.1007/s10857-025-09685-3

Vogelsanger-Holenstein, M., Schukajlow, S., & Bruckmaier, G. (2025). Mathematical modelling and self-efficacy: Immediate and long-lasting effects of teaching mathematical modelling with a solution plan. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01674-3

Vorhölter, K. (2025). Metacognitive behaviour when working on modelling problems in small groups. *ZDM – Mathematics Education*. https://doi.org/10.1007/s11858-025-01661-8

Wiehe, K., Schukajlow, S., Krawitz, J., & Rakoczy, K. (2025). Openness in mathematical modelling: Do experiences of competence and autonomy mediate the effects of an intervention on modelling problems on task values and cost? *ZDM - Mathematics Education*. https://doi.org/10.1007/s11858-025-01670-7

ICTMA -
The International Community of Teachers of Mathematical Modelling and Applications

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Please send future contributions to the editor by email <greefrath@uni-muenster.de>. The next newsletter will be published in October 2025. We are interested in your contributions to any of the current sections including project reports and news.