New approaches in research on beliefs and affect in mathematics education

Ralf Erens[1]; Andreas Ebbelind[2]; Camilla Spagnolo[3]

1 University of Education Freiburg, Germany
2 Linnaeus University, Sweden
3 University of Ferrara, Italy

Keywords: Mathematical Views Conference (MAVI) 2024 – Conference Proceedings

Correspondence: erens@ph-freiburg.de

Editorial

It is always a pleasure for editors to finalise a new issue. This edition features a selection of papers presented at the 30th International Conference on Affect in Mathematics Education, MAVI 30 (Mathematical Views). This anniversary conference was held at the University of Education in Freiburg in September 2024. With numerous participants from countries such as Germany, Italy, the United Kingdom, the Czech Republic, Sweden, Norway, Denmark, Finland, Austria, Spain, Indonesia, Australia, and New Zealand, MAVI 30 became one of the most well-attended conferences in MAVI history.

True to MAVI's supportive and collegial spirit, attendees engaged in insightful discussions on a broad range of research topics related to the affective aspects of mathematics education. Some of the presentations centred on factors that may influence teachers' practices, such as cognitive dissonance, internships during teacher training, and cultural differences in transferring teaching approaches.

Alongside the comprehensive academic programme, participants had the opportunity to attend keynote lectures by two renowned scholars. Prof. Günter Törner from the University of Duisburg-Essen, co-founder of the MAVI community, reflected on 30 years of research in the affective dimensions of mathematics education, covering topics from beliefs as a hidden variable to various frameworks for mathematical views, illustrating the extensive landscape of research on affective aspects of mathematics education. Today's diversity is reflected in the range of topics presented at MAVI30. Prof. Alan Schoenfeld from the University of California, Berkeley, shared his research journey, from investigating students' problem-solving and teachers' decision-making to developing the "Teaching for Robust Understanding" framework. This framework

highlights the classroom dimensions that foster powerful thinking and strong disciplinary identities in students.

The inaugural MAVI conference was organised by Erkki Pehkonen from the University of Helsinki and Günter Törner from the University of Duisburg-Essen, held in Germany in 1995. Since then, a key characteristic of the conference has been its allowance of ample time for participants to engage in detailed discussions about their research with peers. Over several days, the group of researchers collaborated, significantly advancing the field of affect in mathematics education. This format also offered young and experienced researchers the chance to form new national and international connections. Consistent with MAVI tradition, the conference programme included sufficient time for discussion after each presentation, fostering valuable exchanges of ideas, questions, and expertise.

Following the procedure of recent MAVI conferences, papers were submitted in advance for peer review by at least two conference participants. The event welcomed nearly 50 attendees, and the accepted papers were presented and thoroughly discussed. This anniversary conference was not the largest in MAVI's history, which allowed us to avoid dividing into parallel sessions. Following the conference, authors refined their papers based on feedback received both prior to and during the conference, as well as a subsequent review after resubmission, resulting in the versions published in these proceedings.

While affect in mathematics education is a shared interest among all MAVI participants, the papers presented reflect a variety of theoretical perspectives, employ diverse methodologies, and address different educational levels and mathematical content. This diversity is also evident in the papers chosen for this volume. These papers explore affect across primary and secondary education in mathematics, as well as in teacher education and professional development programs. They cover topics such as assessment, entrepreneurial skills, reasoning, and proof, utilising frameworks that are both mainstream in belief literature and those that take a more social perspective. The selected papers have undergone peer review and have been revised based on the reviews and feedback received during the conference.

The first section of this issue looks at affect-related research in professional development. Pocalana & Liljedahl investigated the cultural transposition of the Thinking Classroom approach to the teaching and learning of mathematics within a professional development program for in-service teachers. In light of new technologies, Beste, Wolff & Girnat evaluate the test format for a digital learning environment with

student teachers. In a case study, a Teacher Professional Development (TPD) program focused on mathematical modelling with digital technologies investigates the evolution of practice, beliefs and knowledge under the intervention of TPD (Bassi, Brunetto & Iacono).

Looking at beliefs and knowledge from different perspectives, preservice secondary mathematics teachers' beliefs about teacher knowledge are explored (Hatisaru & Fauskanger), Giadas, L. Muñiz-Rodríguez & L. J. Rodríguez-Muñiz look at mathematics teacher educators and their beliefs and perceived competence. Furthermore, A. Ebbelind, R. Erens, & T. Helliwell discuss theoretical perspectives and methodologies for researching teacher decision-making.

The following papers address cross-curricular issues in affect research: Mathematics on the river, mathematics of the river: unveiling the power of mathematical conceptions (Andrà, Doretto & Salvini), The case of mathematics and chemistry: how ninth graders perceive tasks with cross-curricular overlap (Čech & Samková) and theoretical and empirical considerations on factfullness within affect-related research in mathematics education (Amico, Andrà & Doria).

Another six papers deal with a core issue of MAVI: views and beliefs of mathematics teachers ranging from university education to in-service teachers: The influence of the internship semester on the beliefs of pre-service mathematics teachers (Scherer & Rott), mathematics self-concept and university dropout (Ciccanti, Ferretti, Monica & Viola), embedded mathematics-related emotions at university (Lahdenperä, Gildehaus & Göller). Pre-service teachers' views and noticing are studied by Kuntze, Schall & Krummenauer, and Békési & Ulbrich report on pre-service teachers' beliefs about their use of technology, and Asenova, Cibien & Spagnolo propose a model for teacher training that acts on teachers' beliefs.

Potential change of cognitive-related issues are the theme of another three contributions: Palmer et al. discuss the topic of who or what is to change? From changing teachers to changing teaching in early mathematics, Nicchiotti & Spagnolo examine teachers' views on the difficulty of mathematical tasks, and Marban de Frutos et al. report on the cognitive dissonance of mathematics teachers.

The theme of the final three papers is problem-solving and collaboration in affect research. Hanna Viitala addresses the connection between mathematical performance and affect in collaborative problem solving, Palmér et al. present results on students collaborating on combinatorics and Ebbelind, Palmér & van Bommel report on the beneficial effects of a problem-solving and problem-posing project.

Altogether, the 30th MAVI conference provided varied perspectives on research on mathematics-related affect. The papers in this issue present a rich selection of research methods, some of which are quite new to mathematics education research.

The diversity of areas of interest and the range of theoretical and methodological approaches in these papers highlight the MAVI conference's innovative and inclusive spirit. Additionally, they demonstrate the ongoing development of research and knowledge within this research community.

Ralf Erens, Andreas Ebbelind and Camilla Spagnolo