

CERME 14: Thematic Working Group 24
Representations in Mathematics Teaching, Learning and Research

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Scope and focus of the Working Group

Representations of mathematical concepts and objects are an integral part of doing mathematics and an important aspect of teaching and learning mathematics. Here representations refer both to traditional mathematical productions such as graphs, diagrams, symbols, texts, and models, and also more broadly to pictures, gestures, sounds, stories, metaphors and more. We are concerned with the creation, interpretation, use of, relations between, and reflections on such representations in our minds, hands, bodies, on paper, on screen, and with other analog and digital tools. We are also interested in the roles of representation in recording and communicating information and processes, thinking about and developing mathematical ideas, practices, understandings and expression. Representation can be theorized and interpreted in many ways, and this working group welcomes papers from a variety of different theoretical and methodological frameworks.

Call for papers and poster proposals

We invite papers addressing (but not necessarily limited to) the following questions and issues:

- How do teachers and learners represent mathematics? How do learners make connections or transitions between various modes, registers, or systems of mathematical representation? How can teachers support learners in developing representational competences?
- What roles can representational forms and formats play in enabling and disabling some learners? How can they contribute to the design of more inclusive educational environments?
- What are the roles of unconventional representations in mathematical thinking, including in creative problem solving? How may less familiar representations elicit new sensory experiences during mathematical activity?
- How do the representational affordances (visual, auditory, haptic, etc.) of computer technologies change the dynamics of mathematics and its learning? What are the potentials and pitfalls?
- What relationships are there between representation and affect? Do certain representational activities increase enjoyment of learning and doing mathematics, and others engender fear or humiliation?
- How can different roles and uses of representation be more effectively conveyed in reports, papers and other publications aimed at both the research and teaching communities?.

Papers and poster proposals *must use the CERME template*, and conform to the guidelines at <https://www.cerme14.it/>. CERME 14 uses an electronic submission system <https://www.conftool.pro/cerme14/>. The authors submit the initial version of their paper on the website (uploading it both as a .doc and a .pdf file, and providing the required information, in particular the TWG number).

Reviews and decisions

Each paper will be peer-reviewed by two persons from among those who author papers to this TWG. *All co-authors* can be asked to review up to two papers. The group leaders will decide about the acceptance of posters.

Important dates

- See <https://www.cerme14.it/> for important dates