



TSG 56

PHILOSOPHY OF MATHEMATICS AND MATHEMATICS EDUCATION

The Organizing Team

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The Topic Study Group 56 (TSG 56) is designed to gather a group of congress participants who are interested in the Relationship between Philosophy of Mathematics and Mathematics Education, emphasizing Philosophy of Mathematics Education. It is expected to have high-standard discussions enabling the newcomer to get a broad overview on the state-of-the-art and allowing the experts to lead discussions at a high level.

According to the organizational structure of ICME-14 the TGS 56 sessions will have 240 minutes as two 90-minute and one 60-minute timeslots for oral presentation, and one 60-minute timeslot for short presentation.

ABSTRACT

The main objective of the TGS 56 is to focus on the relationship between Philosophy of Mathematics and Mathematics Education. Our goal is to make explicit the interaction and dialogue between these areas, including what can be highlighted when one uses the methodology of Philosophical research to question the ontology, epistemology or ethics of Mathematics in relation to Mathematics Education, or conversely when one unveils the philosophical outreach of mathematical ideas, concepts or methodologies, especially in an educational context where mathematical practices may be worked through teaching and learning processes.

The relationship between Philosophy of Mathematics and Mathematics Education needs to be treated in all of its complexity. This complexity is illustrated by the questions listed below embodying

different implicit and explicit perspectives of great diversity. These questions also demonstrate how our interests parallel the core issues addressed by the *Philosophy of Mathematics Education*.

Assuming the perspective of Mathematics Education Practice, these questions address:

- the attitude assumed by the teacher in his/her relationship with the students as with the subject of mathematics;
- the processes of learning and teaching Mathematics;
- the curricula developed in schools;
- the underlying ideology of teaching and learning activities;
- the rigor required and presented in research in the field of Mathematics Education;
- the analyses of constructs that have been commonly used in Mathematics Education;
- the presence of technologies in the teaching and learning Mathematics, for instance.

From the perspective of the conceptions of Mathematics and of Education, there arise questions concerning, for instance: the constitution or construction (the choice of the word depends on the assumed philosophical view) of mathematics knowledge from the platonic point of view as well as from the cultural, social and historical perspectives, encompassing the questions of language and logic; the research on methodology in Mathematical Education that is concerned with techniques and methods, but, beyond of that, discussed in the light of ontological and epistemological questions about the investigated object; the presence of technologies in the construction/constitution of mathematics knowledge; the objectives of Mathematical Education from an ethical, epistemological and sócio-cultural point of view.

Philosophy is an activity based on thinking about the world and human practices in a comprehensive, analytical, critical and reflective way. The investigation of the articulation between Philosophy of Mathematics and Mathematics Education calls for fundamental issues that contribute to think philosophically about it as, for instance:

- What is mathematics?
- How does mathematics relate to society?
- Does Philosophy of Mathematics matter for Mathematics Education?
- Does Mathematics Education matter for Philosophy of Mathematics?
- Are there articulations between ontology, epistemology, ethics and teaching of Mathematics and learning activities?
- Are there articulations between ontology, epistemology, ethics and teaching of Mathematics and research on Mathematics Educations? How to work them out?
- How is Mathematical Science constituted/constructed and how it can be taught according to the assumed philosophical view (logicism, formalism, constructivism, quasi-empirism, phenomenology, critical mathematics, social constructivism.)

- How the studies about Philosophy of Mathematics can give theoretical support to teachers and researchers in Mathematics Education that specifically deals with cultural and historical themes?
- Are there some indications in order to treat "culture" from a philosophical point of view that can allow or guide practical affairs in math classrooms?
- What is the significance of information and communication technology in the construction of mathematics knowledge as on the teaching and learning of mathematics?
- What is learning mathematics? What is mathematics teaching?
- What are the aims and purposes of teaching and learning mathematics?
- What is the status of mathematics education as knowledge field?
- Can Philosophy of Mathematical Practice be articulated with Philosophy of Mathematics and with Philosophy of Mathematical Education? How?

The main focus of the group will be on how Philosophy of Mathematics, understood broadly with the addition of philosophical concepts methods and inquiry can enrich mathematics teaching practices and Mathematics Education understanding, theories and research. However another significant strand concerns how Mathematics Education as a field of knowledge can enrich and supplement the Philosophy of Mathematics with its concepts and broader social focus.