TSG 53 Philosophy of mathematics education

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BACKGROUND

The Organising Group for Topic Study Group 53 has been in debate about the structure and content of the three Topic Study Group sessions as well as the related publications. The topic is a broad one and a wide variety of contributions under the heading of the philosophy of mathematics education are included. There has been more debate and discussion about the structure of the sessions. We wish to combine substantial authoritative contributions (30 or 20 minutes papers with 15 or 10 minutes discussion, respectively) with shorter inputs that raise ideas and challenges without falling into the trap of sequences of back to back short paper presentations. Each of these modes will also allow extensive question and answer dialogue with participants / the audience.

ABSTRACT

What is the philosophy of mathematics education? It can be an explicit position that is formulated, reformulated, criticized, refined, etc. But it can also refer to implicit assumptions and priorities, including paradigmatic assumptions that one need not be aware of, but which might be identified through, let us call it, a philosophical archaeology.

The philosophy of any activity comprises its aims or rationale. Thus we ask: what is the purpose of teaching and learning mathematics? An answer explains *why* we engage in these practices and *what* we hope will be achieved. But just considering such purposes quickly leads to seeing the divergence in aims and values of different groups.

A broader view looks at the applications of philosophy to mathematics education including topics such as epistemology, philosophy of mathematics, ethics and

aesthetics. It applies philosophical methods to a critical examination of the assumptions, reasoning and conclusions of mathematics education, systematically enquiring into fundamental questions:

What is mathematics?
How does mathematics relate to society?
Why teach mathematics?
What is the nature of learning (mathematics)?
What is the nature of mathematics teaching?
What is the significance of information and communication technology in the teaching and learning of mathematics?
What is the status of mathematics education as knowledge field?
What deep and often unacknowledged assumptions underlie mathematics education research and practice?
Ethics is a central branch of philosophy that is often ignored or regarded as irrelevant for mathematics. What is or should be the role of ethics in mathematics education?

The philosophy of mathematics education matters because it gives people new ‘glasses' through which to see the world. It enables people to see beyond official stories about the society, mathematics, and education. It provides thinking tools for questioning the status quo, for seeing 'what is' is not what 'has to be'; enabling us to imagine alternatives possibilities. This is important throughout mathematics education research but also especially important in mathematics teacher education, when new mathematics teachers learn how to view the worlds of the teaching and learning of mathematics.

The sessions will offer expert presentations on key questions and issues of the field with plenty of space and time for questions, discussion and participation. It will also allow new issues to emerge to stimulate discussion and controversy, ultimately to encourage growth in research and teaching developments in mathematics education inspired by philosophical perspectives.

Plan of the 4 sessions of 90 minutes each

SESSION 1

Presentation 1 (30 minutes) group discussion/ questions and answers (15 minutes)

Paul Ernest - What is the business of the philosophy of mathematics education? Overview and critique of common ideological assumptions in mathematics education

Presentation 2 (30 minutes) group discussion/ questions and answers (15 minutes)

Jean Paul van Bendegem – The Philosophy of mathematical practice: A challenge to traditional philosophies of mathematics

SESSION 2

Presentation 3 (30 minutes) group discussion/ questions and answers (15 minutes)

Ole Skovsmose - Critical mathematics education

Presentation 4 (30 minutes) group discussion/ questions and answers (15 minutes)

Maria Aparecida Viggiani Bicudo – Epistemological, ontological, anthropological questions posed by the presence of computers and other media in mathematical education practice

SESSION 3

Presentation 5 (20 minutes) group discussion/ questions and answers (10 minutes)

Ladislav Kvasz - The language of mathematics in a historical, epistemological and educational perspective

Presentation 6 (20 minutes) group discussion/ questions and answers (10 minutes)

Regina Möller – Episodes in the history of mathematics: educational and philosophical significance

Presentations of submitted papers. Brief presentations / provocations (5 minutesutes long) followed by group discussion/ questions and answers (10 minutesutes long) Selected from submitted / abstracts papers (2 X 15 minutesutes long)

SESSION 4

Presentations of submitted papers. Brief presentations / provocations (5 minutes) followed by group discussion/ questions and answers (10 minutes) Selected from submitted / abstracts papers (4 X 15 minutes)

Closing panel discussion of 5/6 speakers (Main presenters/ Organising Group)

Panel members speak for 2-3 minutes each plus discussion / questions and answers (30 minutes). Topic: *Growth points and key ideas for the future of*

mathematics education from philosophical perspectives: problems, challenges and opportunities.

PUBLICATION PLANS

A volume of essential texts will be available online prior to the congress. The six key presentations, plus submitted papers approved the Organising Group will be published as a book or journal special issue after the conference.