



TSG 51 Diversity of theories in mathematics education

Co-chairs:

Tommy Dreyfus (Israel)

tommyd@post.tau.ac.il

Anna Sierpinska (Canada)

anna.sierpinska@concordia.ca

Team members:

Stefan Halverscheid (Germany)

Steve Lerman (UK)

Takeshi Miyakawa (Japan)

IPC Liaison person: Alain Kuzniak (France)

Abstract (Revised, July 4, 2015)

Our group continues the efforts of the mathematics education community to consolidate and compactify the theoretical foundations of the domain. In the belief that there is nothing more practical than a good theory, we will focus on how theories used in the different approaches, perspectives and research programs in mathematics education answer the most fundamental questions about learning, teaching, and mathematics, as they interact within various institutional cultures. Here are some examples of such questions:

- I. What does it mean to know something or a given particular thing in mathematics? Who decides and what is the basis for decision? How does one get to know (learn) something or a particular thing in mathematics?
- II. What does it mean to teach mathematics in general or a particular mathematical concept or process? What does it mean to teach it well? Who decides and what is the basis for decision? How does one become a good teacher? What behaviors or actions contribute to teaching (something) well?
- III. What is mathematics? What is mathematics as a school subject? What is important mathematics to teach and what is not? What meaning of a particular mathematical concept or process should be learned and taught? Who decides and what is the basis for decision?

Often, it is neither desirable nor useful to separate learning, teaching and mathematics. It is for the sake of clarity only that we structured the questions

around this distinction that was inspired by the vertices of the “didactic triangle”: student, teacher, mathematics. We stress that questions that combine the different vertices of the triangle are expected and useful. Many of these questions will relate to empirical research (as do some of the above). In addition to how theories answer the most fundamental questions about learning, teaching, and mathematics, the work of the group will also include on the opposite direction: How does the use of a theory determine how the theory conceives of knowing, learning and teaching mathematics?

The Topic Study Group will meet for four sessions of 90 minutes each. During each session, an invited talk will be presented and time will be set aside for discussion. In addition, there will be some time for contributed talks or posters, and a concluding panel discussion.

We are happy to announce that four eminent colleagues have agreed to give the four invited presentations:

- Anna Sfard (University of Haifa, Israel)
- Ricardo Cantoral (Cinvestav, IPN, Mexico)
- Yasuhiro Sekiguchi (Yamaguchi University, Japan)
- Michèle Artigue (Université Paris Diderot - Paris 7, France)

Submissions of short papers and posters are welcome; please see the 2nd announcement for instructions.