TSG 18 Reasoning and proof in mathematics education

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There is international recognition of the importance of reasoning and proof in students' learning of mathematics at all levels of education, and of the difficulties met by students and teachers in this area. Indeed, many students face difficulties with reasoning about mathematical ideas and constructing or understanding mathematical arguments that meet the standard of proof. Teachers also face difficulties with reasoning and proof, and existing curriculum materials tend to offer inadequate support for classroom work in this area. All of these paint a picture of reasoning and proof as important but difficult to teach and hard to learn. A rapidly expanding body of research has offered important insights into this area, but there are still many open questions for which theoretical and empirically based responses are sorely needed.

TSG 18 will offer a forum for an overview of the state of the art, invited contributions from experts in the field (V. Durand-Guerrier, G. Hanna, E. Knuth, and M. A. Mariotti), presentation of high-quality research reports from TSG participants, and discussion of directions for future research.

We invite submissions of theoretical or empirical research reports on any topic related to reasoning and proof in mathematics education. The reports can relate to any level of education: elementary, secondary, university (including pre-service teacher education), or in-service teacher professional development. Below is an illustrative list of topics research reports can address:

- Classroom-based practices aiming to support learning of reasoning and proof;
- The place of reasoning and proof in textbooks or other curriculum materials;
- Historical, epistemological, or philosophical perspectives on the place of reasoning and proof in school mathematics or in the field of mathematics;
- Argumentation and proof: epistemological, cognitive, and didactical aspects;
- Theoretical and methodological approaches to examining epistemological, cognitive, didactical, assessment, social, or cross-cultural issues related to the teaching/learning of reasoning and proof;
- The role of technology in the teaching/learning of reasoning and proof;
- Students' or teachers' knowledge and beliefs about reasoning and proof.

To support the development of scientific knowledge related to reasoning and proof gained at TSG 18 during the conference, there is a preliminary plan for a post-congress **publication** with Springer based on contributions presented at TSG 18. The precise nature of this possible publication will be discussed during the conference.