Topic Study Group 4.4: In-service mathematics teacher education and mathematics teacher professional development for secondary level

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Team details

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Overview

Twenty years ago, Hilda Borko published her milestone paper 'Professional Development and Teacher Learning: Mapping the Terrain' (Borko, 2004). Borko pointed to three phases of research on teachers' learning and professional development (PD): Phase 1 refers to models providing existence proofs of effective PD, Phase 2 looks at well-specified PD programs going beyond a single site, and Phase 3 involves large-scale PD studies to inform policy. It appears that since then, research on mathematics teacher PD has considerably expanded regarding all these phases, as reflected in recent international working groups (e.g., this TSG in ICME-14 centered on PD initiatives at scale; new groups in both

CERME and ICME focus on how PD facilitators spread well-specified programs, etc.). However, many challenges in this field persist, while new challenges arise.

One of the challenges that persists over time concerns the difficult task of disseminating successful and effective results of research to the classroom. Artigue has argued that one obstacle to such dissemination could be the distance between researchers and teachers in relation to mathematics, its teaching and its learning. One way to overcome this obstacle is to include teachers in research projects, at different levels and under different theoretical conceptions of the role of the teacher. In recent years we see more involvement of teachers in research (e.g., the ICMI-Study 25 conference on "Teachers of Mathematics Working and Learning in Collaborative Groups" (2020), included a panel of teachers sharing their perspectives).

One main focus of this TSG is on collaborative and cooperative work between researchers and teachers to advance research-based PD projects and the dissemination of their products within secondary mathematics classrooms. We note that while differences exist between collaborative and cooperative research frameworks, for example in terms of methodological issues and hypotheses about the characteristics of didactic knowledge construction, they both share an interest in the participation of teachers as the driving force of the research.

Another challenge for PD and teacher learning rises from global issues, such as the COVID-19 pandemic, which drastically changed frames and environments for teachers' PD. In addition, technological developments enable new modes of communication, which also impact on how teachers can collaborate and learn. These examples and others are included in the second focus of this TSG: innovative models for mathematics teacher PD that form new opportunities which have not been widely offered or researched before.

Areas of interest

We encourage submissions around the following foci:

1. The study of in-service teacher education or PD initiatives aimed at improving secondary mathematics teaching through collaborative or cooperative work between researchers and teachers.
2. Innovative models of mathematics teacher PD, for instance, hybrid models resulting from the COVID pandemic, or other new PD formats (e.g., integrating technology resources).

For both foci, small-scale as well as large-scale studies are welcomed, and both qualitative and quantitative investigations are acceptable. In any case, empirical studies should include details that

establish the soundness of the research (e.g., underlying theoretical basis, methodology employed, link(s) to previous studies, etc.).

The following questions represent issues relevant to the two foci. The degree to which contributions relate explicitly to these questions will be taken as a criterion for the acceptance of papers and proposals for posters.

Focus 1

- What was the challenge/issue/gap in the literature addressed in the study, and in what way was collaboration between researchers and teachers expected to improve the existing situation?
- What kind of environments were developed as means for the cooperative/collaborative work?
- What was the scope of the cooperation/collaboration, in terms of the number of people and institutions involved? What were the different phases within the methodological structure of the research?
- If the cooperative/collaborative work has already concluded, what were the participants' perspectives as to the level of improvement reached? Were the results re-assessed over time? If so, what was the extent of sustainability in relation to the expectations regarding long-lasting impact?
- Which type of instruments were developed or applied to understand the objectives achieved and to communicate and transmit the results of the work and of the research to all partners involved, as well as to other interested parties?

Focus 2

- What is the nature of the innovative PD model developed? In what ways is it different from past experiences in similar contexts?
- What aspects of implementing the innovative model were researched?
- What challenges did the study identify in regard to the innovative model?
- What are the main affordances of the innovative model, for example in terms of operational or didactic advantages?
- Which type of instruments were developed, if any, to understand the level of success of the innovative model?

How to make a submission to this Topic Study Group

Submissions for Topic Study Group Papers and proposals for Posters open 28 April 2023 via the official ICME-15 website, icme15.org. The website also contains a timeline of dates for the activity of the Topic Study Groups in the lead up to the Congress.

For questions about this TSG, please contact the Co-Chairs using the email addresses provided.