Topic Study Group 4.6: Knowledge in/for teaching mathematics at secondary level

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Team details

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Overview

TSG 4.6 aims to display the progress in the discussion on mathematics education research concerning the theme “Knowledge in/for teaching mathematics at secondary level”. The goal of TSG 4.6 is to focus on a set of critical areas and to promote the international discussion on the insights and challenges researchers, mathematicians, teacher educators, teachers, and policy makers are facing when dealing particularly with teachers’ knowledge in/for teaching mathematics at secondary level.

Areas of interest

TSG 4.6 will emphasize the following issues and respective key questions:

1. Conceptualization of knowledge in/for teaching mathematics at secondary level:

- What are the different theoretical perspectives on knowledge in/for teaching mathematics at secondary level? What meeting points exist between these perspectives?
- What is the nature and structure of knowledge in/for teaching mathematics at secondary level? How do the different aspects/subdomains that make up this knowledge interact?
- To what extent is the conceptualization of knowledge in/for teaching mathematics at secondary level topic-specific (e.g., algebra, geometry) or activity-specific (e.g., task design, interpretation of students' mathematical thinking)?
- How does the conceptualization of knowledge in/for teaching mathematics at secondary level relate to theoretical approaches addressing this knowledge in action (e.g., teacher noticing or interpretative knowledge)?
- What role do cultural factors play in the conceptualization of knowledge in/for teaching mathematics at secondary level?

2. Measurement of knowledge in/for teaching mathematics at secondary level:

- What aspects are measured when assessing knowledge in/for teaching mathematics and this knowledge in action at secondary level?
- How is both knowledge in/for teaching mathematics and this knowledge in action measured at secondary level?
- Are these measurements/instruments suitable for different teaching topics and teachers' activities?
- What are the strengths and limitations of measuring knowledge in/for teaching mathematics at secondary level? How is reliability and validity addressed?
- What is the impact of cultural factors on the measurement of knowledge in/for teaching mathematics at secondary level?

3. Connections between knowledge in/for teaching mathematics, teaching practice, and students' achievement at secondary level:

- How do teachers use their knowledge in/for teaching mathematics to interpret the complexity of teaching situations and make informed decisions to improve secondary students' achievement?
- How does teachers' knowledge in/for teaching mathematics impact their instructional quality and students' achievement?
- How are the connections between teachers' knowledge and instructional quality, and students' achievement influenced by cultural factors?
- What role can knowledge in/for teaching mathematics at the secondary level play in promoting inclusive and equitable teaching practices?

4. Practical implications for teacher education of research on knowledge in/for teaching mathematics at secondary level:

- What is the relationship between knowledge in/for teaching mathematics at secondary level and teachers' experience/training level?
- What aspects of this knowledge should be addressed in teacher education or professional learning, and through what kinds of teaching designs?
- How can research on knowledge in/for teaching mathematics at secondary level be used to improve the quality of teacher education/training?

Since these aspects will structure the work in the TSG 4.6 thematically, we ask the paper submitter to assign themselves to one or more of the mentioned aspects and to address the corresponding aspects in the submission.

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.