



Topic Study Group 3.12: Research and development on textbooks and resources for learning and teaching mathematics

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Overview

TSG 3.12 focuses on issues related to print and digital resources for learning and teaching mathematics. We seek contributions that conceptualise and investigate print and digital textbooks, and related resources that are currently (or that were historically) used for teaching and learning mathematics in classrooms. Related resources may include teacher manuals, professional online forums, and student practice and assessment materials.

* Team details correct at time of print; 28 April 2023





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Across the world, textbooks and related teaching and learning resources exhibit ever increasing variety: while print resources continue being essential in some contexts, static and dynamic digital resources are ever more present, and what they offer can be overwhelming. While some textbooks remain rather prescriptive about what to teach and when, other resources rely on professional expertise of teachers, and on their collaboration, to specify mathematics to be taught on daily basis. Mathematics itself is structured in a variety of ways in different textbooks and is not always problematised. We would like to pay attention to this variety, summarise what has been learned so far, and strategize about directions for future research.

We will link to the work of the “textbook” TSGs from prior Congresses (see e.g., Fan, Trouche, Qi, Rezat, & Visnovska, 2018), and to the ideas emerging within regional working groups and specialised conferences (e.g., ICMT). We hope to gather, examine, and advance theoretical and methodological approaches suitable to conceptualise, study, and design resources for classroom teaching and learning. We hope to encourage textbook-related analyses and conversations that uncover the factors that make the difference to teachers’ work and students’ mathematical learning.

Areas of interest

Conceptual, philosophical, empirical, and historical submissions, in which authors identify how the insights from their work inform future textbook conceptualisations and designs, are relevant to the considerations of TSG3.12. The questions below are illustrative of the topics of interest, but additional textbooks-related topics are encouraged.

1. On the nature of mathematics in textbooks:
 - Who is mathematics for? Who is included/excluded in how specific textbooks present mathematics? How could textbooks do a better job at this?
 - What is mathematics for? What are the kinds of mathematics endeavours and futures that were, are, or could be presented in textbooks?
 - How does mathematics come to be? What practices are presented in textbooks as giving rise to mathematics?
 - How are decisions about mathematics in textbooks made?
 - How do the features above shape teaching and learning in a classroom?
2. On sequencing of mathematics in textbooks and in their use:
 - What underlying logic organises the mathematical content in a textbook? How does one learn about that logic? Who has access to this logic, why, and how?
 - How is sequencing of mathematics different in digital resources? How and when does this difference matter?





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- How do we document the strengths and weaknesses of how mathematics is organised in a textbook? What are some bases from which to explore (and question) the organisation of mathematics in a textbook?
 - What is the relation between the sequencing of mathematics and assessment (a) in a textbook, and (b) in a classroom?
3. On the relationship between teaching of mathematics and textbooks:
- What can we learn about textbooks from how they are used by teachers, and when can we learn something worthwhile?
 - What can we learn about teachers and teaching from how teachers use textbooks and other resources?
 - What are noteworthy textbook features – present or missing – that have a potential to productively engage, mould, or enhance the work of classroom teachers? Does the digitalization of resources give rise to new noteworthy features and if so, how? How do we go about researching such features?
 - How do we conceptualise teachers (as textbook users, as textbook designers, as participants in a profession) in the context of textbook implementation?
 - How do initial teacher education and professional development programmes address the use of textbooks in teaching?
4. On learning of mathematics with or from textbooks/resources, in and outside classrooms:
- How do people navigate textbook/resource selection and use when seeking to learn mathematics?
 - How do interactive, networking, and feedback elements of digital resources shape individual learning and learning in classroom or collaborative settings?
 - What is the role of students in development of textbooks and other teaching and learning resources?

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.

