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# TEXTBOOK SIGNATURES: EXPLORATION AND ANALYSIS OF MATHEMATICS TEXTBOOKS WORLDWIDE

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## AIM AND RATIONALE

Textbook analyses can provide a comparison of learning opportunities triggered by textbooks among different countries. Being an important medium for representing the written curriculum, textbooks play an important role in shaping mathematics learning and teaching in schools. Hence, international textbook analyses can potentially offer insights into curriculum intents and the suggested teaching approaches in the different countries. Building on the idea of *lesson signature* suggested by Hiebert et al. (2003), Charalambous et al. (2010) propose that textbooks within the same country may have a “textbook signature”—“uniform distinctive patterns”—in the textbooks (p. 146). Using these ideas, we have proposed a notion of textbook signature and have attempted to characterise our analyses of textbooks in gradient (Choy, Lee, & Mizzi, 2015) and fractions (Lee, Choy, & Mizzi, 2016) using our notion of textbook signatures. Our comparative studies on introduction of notions of gradient and fractions in Germany, South Korea and Singapore imply that textbook signatures are unique in different countries and may hold important implications for teaching and learning.

Following a discussion group (DG) about textbook signatures, which took place in PME 40 in Hungary, we have concluded that research into our notion of textbook signatures is a promising strand of research. For example, textbook signatures can potentially describe and explain the different curricular approaches adopted in different educational contexts for improving the way of teaching and learning mathematics. However, our DG participants highlighted the need for more data analyses using textbook signatures from a larger number of countries or within the same country (especially from countries with a non-centralized educational system). Hence, one of the main goals of this working session (WS) is to provide interested researchers to collaborate and work on textbook analyses using our notion of textbook signatures. Participants of this WS are invited to carry out a textbook analysis focusing on the introduction of gradient for their own country:

**Hence, participants are required to bring along one textbook or a copy of the first chapter(s) of the textbook which introduces the topic of gradient to students the first time at secondary level in their respective country.**

We not only aim to present the findings of our textbook analyses using textbook signatures, but also refine our notion of textbook signature during the WS. We believe that this WS will be a good platform for researchers to have conversations about textbook signatures and their relevance in mathematics education.

## KEY QUESTIONS

The working session activities will be guided by the following key questions:

- What is our current notion of textbook signatures and how can it be applied to different textbooks worldwide?
- What curricular and textbook features can be seen in the textbook signatures from different countries?
- What implications for teaching and learning mathematics can be drawn from textbook signatures?
- How can we refine our notion of textbook signatures following our findings from the WS?

## WORKING SESSION ACTIVITIES

Segment	Duration	Description	
D A Y	1	15 min	Session 1: Presentation: Notion of textbook signatures by Angel Mizzi
		10 min	Session 2: Recap of what we discussed in PME 40 by Ban Heng
1	2	15 min	Session 1: Illustrative use of theoretical framework and presentation of textbook analysis techniques by Ban Heng and Mi Yeon
		50 min	Session 2: Working Session – Exemplary textbook analyses
D A Y	3	50 min	Session 1: Working Session - Initial textbook analyses
		15 min	Session 2: Presentation of results from textbook analyses
2	4	10 min	Session 1: Presenting first ideas, results or barriers upon application of the textbook signatures framework
		15 min	Session 2: Rounding Up: Closing remarks and future research

## References

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- Hiebert, J., Gallimore, R., Garnier, H., Givvin, K. B., Hollingsworth, H., Jacobs, J., . . . Stigler, J. (2003). *Teaching mathematics in seven countries: Results from the TIMSS 1999 video study, (NCES 2003-013 Revised)*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
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