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I Spy with my Little Eye – Teachers’ linkages about historical snippets in textbooks

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The aim of this explorative survey is to identify teachers’ beliefs about tasks concerning the history of mathematics. This poster proposal will give an insightful view on a pilot study on teachers’ beliefs about historical snippets in textbooks. First results of these pilot study can be discussed at CERME11 and may help to develop the main study.

Keywords: History of mathematics, beliefs, textbook.

Research topic

Textbooks play a crucial role in most mathematical lessons (Hiebert et al., 2003). Interactions between teachers and textbooks are an active process of re-sourcing the resource (Adler, 2000, p. 207) and have an impact on mathematical lessons (Brown, 2009). If we consider that tasks concerning the history of mathematics are included in textbooks and that teachers use their pedagogical design capacity to interact with these tasks, the following research questions are formed: Which connotations do the teachers have over these textbooks’ tasks? Do teachers identify the same benefits on history of mathematics in education like researchers do?

Theoretical framework

The presented pilot study uses historical snippets to stimulate prospective teachers’ linkages, due to the fact that historical snippets are the most founded tasks in German textbooks (Schorcht, 2018). Tzanakis and Arcavi shaped the concept of “historical snippets” (Tzanakis & Arcavi, 2002, p. 214): A Historical snippet informs students or stimulates students’ activity. The detailedness ranges from simple dates into specifics about the history of mathematics. The possible content of a historical snippet could be, for example, biographical dates, photographs, introduction into topics, etc.

The international overview shows only small variations on types of tasks over different countries. For example, Xenofontos and Papadopoulou (2015) identify two types of tasks in Greek and Cyprus textbooks: those which inform students about the history of mathematics and those which lead to students’ mathematical activity. In German textbooks Schorcht (2018) identifies similar types of tasks. In comparison with the results of the studies, the presented survey determines three types of tasks: informative type, acting type and personalization type.

Method and Sample

The pilot study shows participants three historical snippets in an online instrument¹. These tasks are selected to represent one of the three types of tasks: one informative type, one acting type, and one personalization type. The topics are Pounds and Hundredweights, Egyptian Fractions, and Sofia

¹ For a closer look into the online instrument, use the following link: <https://surveys.hrz.uni-giessen.de/limesurvey/index.php/794939?lang=de> (online available until CERME11 and in German).

Kowalewskaja's biography. All tasks are from German textbooks of grade 3, 4 and 6. The participants are German mathematics pre-service teachers studying for primary level at University of Giessen. During the online survey, the participants should name similarities of two tasks and describe a third task in a different way. For example, the first two tasks (Pounds and Hundredweights, Egyptian Fractions) deals with mathematics, the third task shows a biography of Sofia Kowalewskaja. In this way, pairs of attributes of tasks emerge by the participants (for example: "deals with mathematics" and "shows a biography"). Afterwards, the participants define their pairs of attributes (for example: "deals with mathematics" = "the task request students to do math"). This kind of method is named as Repertory grid method (Kelly, 1955). The outcome of this online instrument will be a table, where each task can be assigned to one or more attributes. These attributes allow an insight into teachers' connotations about these tasks.

Conclusion

The poster will show some tables from participants and figures of the used tasks. The Repertory grid method may give an overview on teachers' linkages about historical snippets. The results presented at CERME11 should initiate a discussion about the research questions and the developed pilot study. The hypothesis is, teachers didn't realize the benefits of history of mathematics in education and therefore integrate historical snippets without any idea how they should exhaust the benefits for the students.

References

- Adler, J. (2000). Conceptualising resources as a theme for teacher education. *Journal of Mathematics Teacher Education*, 3, 205–224. doi:10.1023/A:1009903206236.
- Brown, M. W. (2009). The teacher–tool relationship: Theorizing the design and use of curriculum materials. In J. T. Remillard, B. A. Herbel-Eisenmann, & G. M. Lloyd (Eds.), *Mathematics teachers at work: Connecting curriculum materials and classroom instruction* (pp. 17–36). New York, NY: Routledge.
- Hiebert, J., Gallimore, R., Garnier, H., Givvin, K. B., Hollingsworth, H., Jacobs, J., et al. (2003). *Teaching mathematics in seven countries: Results from the TIMSS 1999 video study*. Washington, DC: NCES.
- Kelly, G. A. (1955): *The psychology of personal constructs*. New York, NY: Norton.
- Schorcht, S. (2018). *Typisierung mathemathikhistorischer Beispiele in deutschen Mathematikschulbüchern der Klassenstufe 1 bis 7*. Münster, Germany: WTM-Verlag.
- Tzanakis, C. & Arcavi, A. (2002). Integrating history of mathematics in the classroom: an analytic survey. In J. Fauvel & J. van Maanen (Eds.), *History in mathematics education: the ICMI study* (pp. 201–240). Dordrecht, Netherland: Kluwer.
- Xenofontos, C., & Papadopoulos, C. E. (2015). Opportunities of learning through the history of mathematics: the example of national textbooks in Cyprus and Greece. *International Journal for Mathematics Teaching and Learning*, 1–18. Retrieved from <http://www.cimt.org.uk/journal/xenofontos.pdf>