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Investigating curriculum resources and mathematics knowledge for teaching in teacher planning discussions

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Keywords: Mathematics teachers, curriculum resources, MKT.

The research topic

This poster reports on the design of a study that will be conducted in the fall of 2021, with the aim to create more knowledge on in-service mathematics teachers’ use of curriculum resources. Our research questions are: what types of resources are used, in what way, and for what reasons? The data in the study consist of audio-recorded collaborative teacher planning discussions in Sweden where, just like in other countries, new teaching resources (digital and analogue) have made their way into practice the last decade. It is of interest to explore how these resources are used together with existing resources, particularly as the Swedish curriculum offers and leaves teachers with large freedom in choosing their teaching resources.

The Design Capacity for Enactment (DCE) framework (Brown, 2009) describing resources use and Mathematics Knowledge for Teaching (MKT) (Ball et al., 2008) will tentatively be the frameworks used for analyzing these discussions.

Theoretical background

Teachers participate in several different communities of practice (Lave & Wenger, 1991). One such community can be collaborative planning, where teachers together discuss matters of teaching in-between enacting lessons, either casually or more organized with specific common goals.

While planning lessons (individually or collaboratively) teachers draw upon different curriculum resources as well as their experience. When it comes to teachers’ use of these resources in the practice of planning for and enacting teaching, Brown (2009) has proposed the DCE framework that connects curriculum and teacher resources, as well as different types of use, such as offloading, adapting, or improvising.

Brown’s model emphasizes different types of resources. Each resource can incorporate different aspects relevant for teaching mathematics. These aspects can be labeled using the teacher knowledge domains in the MKT framework (Ball et al., 2008): Common Content Knowledge (CCK), Specialized Content Knowledge (SCK), Horizon Knowledge (HK), Knowledge of Content and Students (KCS), Knowledge of Content and Teaching (KCT) and Knowledge of Content and Curriculum (KCC).

In short, CCK can be described as the mathematical knowledge needed to teach, for example correct mathematical concepts and language, or to know if a calculation or statement is correct or not. SCK helps to connect, deepen and analyze different mathematical concepts, used in teaching. KCS relates
to students through, for example, knowledge on common mistakes or thinking in relation to a mathematical content. KCS can help identify student thinking from spotting a mistake, and KCT in its turn, helps in choosing a suitable response to the student, or to guide the teaching of that content in general. HK is about knowledge on how mathematical concepts are related and connected. Parts of HK are closely intertwined with KCC, which corresponds to knowledge about the conditions for teaching mathematics in school, such as how the curriculum defines the mathematical progression through its sequencing, or the subjects’ connections to other subjects.

**Method**

A previous project examining mathematics teachers’ communities of practice, has generated recorded data from upper-secondary school mathematics teacher discussions. Around ten of these discussions from three different teacher groups with about five teachers in each, ranging upwards 60 minutes in length each, concern the planning of lessons covering a variance of upper-secondary school mathematical content. These planning discussions will be transcribed and analyzed through content analysis, with a deductive approach. The analysis of the discussions aims to describe the practice of teachers in terms of types of knowledge used within this planning context, using the domains of the MKT framework (Ball et al., 2008) for the description of types of knowledge and aspects of Browns’ DCE framework (Brown, 2009) for the types of resource used.

**Possible results and implications**

Based on a preliminary analysis, an asymmetry regarding what domains of the MKT framework that are being visited during these planning discussions, is expected to be found. Further, an asymmetry is expected to be found in the types of curriculum resources that are being used. There is also a possibility to investigate whether certain types of resources associates with certain domains of MKT. This can help to create new knowledge on what kind of support teachers need from curriculum resources, both in content and style. The poster will set out the design for the study and following the analysis conducted during the fall 2021, some of the results will be possible to include at the CERME12 conference.

**References**

