

MATHEMATICAL KNOWLEDGE FOR TEACHING AS A MEASURE OF COHERENCE IN INSTRUCTION MATERIALS PRODUCED BY TEACHERS ON THE INTERNET

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KEYWORDS

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SUMMARY

In the poster, a plan for upcoming research is presented as a result of two previous studies. A first study revealed a discrepancy between instruction materials in mathematics shared by teachers through the Internet (Liljekvist, 2012, in preparation). In that study the didactical message was analysed, such as, topic-specific features related to syllabus, mathematical ideas, competencies, cognitive demands, and degree of devolution. Further on, an analysis was conducted on in what way these task-features could be understood as representations of didactical engineering. In a second study, lesson plans produced by student teachers were analysed and coherence was used as a measure of student teachers' Mathematical Knowledge for Teaching (MKT) (van Bommel, 2012a, 2012b). The study indicated that MKT influenced the degree of coherence within the produced lesson plans.

In the suggested upcoming research the coherence and lack of coherence within the analysed instruction materials made by teachers will be analysed using the MKT framework. In the poster, two examples will be presented to show in what way MKT could explain the degree of coherence within each example. Furthermore, the concept Didactical engineering and the framework MKT will be outlined.

CONCEPTUAL FRAMEWORK

Didactical engineering “deals with the production of the possible and available meanings of a students’ activity“ (Herbst & Kilpatrick, 1999, p. 7), hence, a teacher has the didactical responsibility to outline a task, or adopt it (Brousseau, 1997, Kieran, 1998) and thereby orchestrate a didactical situation to address, for instance, goals in syllabus.

MKT can be described as the mathematical knowledge needed to carry out the work of teaching mathematics (Ball, Phelps, Thames, 2008). The MKT model consists of 6 domains and complemented the PCK notion suggested by Shulman (1986). As a result, items were developed to be able to study the relationship between teacher knowledge and pupils’ achievement. In this study the MKT model will be used to study the relationship between teachers’ apparent knowledge and coherence in their produced materials. The relevance of the connections between features within the produced instruction materials, determine the degree of coherence.

RESEARCH QUESTION

How can the degree of coherence in teacher-shared instruction material on the Internet, be understood in terms of MKT?

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