

A Case Study on Content and Adaptation of Experienced High-School Mathematics Teacher's Mathematical Knowledge for Teaching Through Pedagogical Reflection

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The purpose of this study was to explore, through pedagogical reflection, the content and adaptation of an experienced high-school mathematics teacher's mathematical knowledge for teaching. Firstly, via observation and discussion, the experienced high-school mathematics teacher's "core activities" of mathematics teaching were identified, and some interview questions were compiled in terms of the mathematical analysis of these core activities. Secondly, the reflections regarding the demonstrations of two teachers were provided. Findings of this study indicated that knowledge of content and students involved the teacher's knowing and understanding of his students' learned mathematical skill, mathematical knowledge and strategies for solving mathematical problems; knowledge of content and teaching involved the teacher's ability of sequencing the teaching topics; knowledge of content and curriculum involved the teacher's familiarity with the concepts that had been and would be taught in the same subject area during the preceding and subsequent years in school; common content knowledge involved the design of mathematical exercises and tasks; specialized content knowledge (SCK) meant that the teacher would be able to choose an appropriate example and representation to explain the mathematical concepts; horizon content knowledge (HCK) implied that the teacher would be able to know the mathematical contents that students needed but were not included in textbooks. Furthermore, the case teacher's SCK was adapted to that of the two teachers. Specifically, some was assimilated to the two teachers' SCK, and some was accommodated to HCK. This kind of pedagogical reflection made the teacher's SCK the basis of the pedagogical action.

Keywords: pedagogical reflection, core activities of mathematics teaching, mathematical knowledge for teaching

主題文章

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