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Investigating mathematics teacher learning using a research-designed resource in a lessoning study

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Abstract

The study reported in this thesis explored how mathematics preservice teachers used a research-designed resource named the Mathematics Teaching Framework (MTF) in the context of a particular lesson study called lessoning study (L/S), and the implications thereof for the nature of teacher learning. This study was located within the field of teacher collaborations that seek to understand the relationship between teacher-researcher collaborations and resources designed for collaborations in a collaborative environment and so to gain insights about the research–practice gap.

This study drew from ideas of Wenger's (1998) community of practice theory supplemented by both Sfard's (2008) communicational theory and Mercer's (1996) modes of talk to investigate what happens when mathematics preservice teachers collaborate with a resource for collaborations. What happens to this resource? How do collaborations offer opportunities to learn? What kinds of opportunities arise? What enables learning opportunities to arise?

This case study involved an L/S community of practice of four mathematics preservice teachers and the researcher. When a group of individuals collaborate in a community they partake in discursive activities of that community (Sfard, 2008). Building from what is known about discursive activity of mathematising (talk about mathematical objects), this study focused on a particular discursive activity of MTFying: a construct I developed and defined as talk about MTF objects.

This study investigated the relationship between teachers' MTFying discursive activity and the opportunities for teacher learning that arise through participation in L/S activities. The results showed that teachers who participated in this L/S study had locally defined practices guiding their work. These practices included lesson planning by identifying what was critical for learners to learn, teaching lessons in classrooms for addressing learners' needs, observing those lessons, and reflecting on those implemented lessons. As teachers engaged in this work, collaborative, MTFying, reflective and problematising practices were established. The results of this study further highlighted the important role played by the knowledgeable other (the researcher) for these practices to emerge. In addition, this study discovered that the process of using MTF collaboratively enabled opportunities to learn how to capture learners' needs, content to be learnt, and teaching strategies related to critical aspects of object of learning, instructional coherence and mathematical teaching. At the same time, the results from the analysis also revealed that the knowledgeable other had opportunities to learn how to

scaffold the MTFying discursive activities during the lessoning study sessions. These were categorised into high scaffolding, moderate scaffolding and low scaffolding.

This study has also revealed that a tool designed for collaboration may be transformed and become a tool from collaboration reflecting teachers' practice in new ways.

Keywords: Critical aspects of object of learning; MTF; discursive activities; collaboration; scaffolding; Lessoning study; opportunities for teacher learning