Abstract

Teachers learn their profession throughout their careers but how this happens is elusive. This research attempts to find out how mathematics for teaching (MfT) evolves in individual teachers and whether it can be promoted within a lesson study setting for in-service teacher development. The present small-scale, school-based “ethnographic” qualitative study uses participant observer methodology. A detailed analysis of one lesson study cycle is presented, focusing on a team of secondary mathematics teachers’ pre and post-lesson discussions.

Analysis and interpretation of findings are structured initially in four components of knowledge for teaching: mathematical, psychological, didactical, and pedagogical. A fifth component – the philosophical – is identified in the pre-lesson discussion from the data, prompting the extension of the theoretical framework used for this study. The philosophical component assumes normative principles and value decisions, which are interwoven into the subject matter knowledge about mathematics. While it is seldom discussed it seems to be always present and can even be identified as implicit content of teaching. Shifts in teachers’ cognition and practice through the lesson study process are noted across all five components of MfT which moreover are discerned to function cohesively and to resist separate analysis. The findings further show certain conditions needed to promote teachers’ learning in lesson study settings, including the influential roles of mentorship and of observing one another’s practice in the classroom.

The results of this study are consistent with the aim for a supportive collegial network built over time and acting as a source of continued learning and ongoing improvement of teaching practice. They also suggest that the incremental changes observed in teachers’ MfT hold a promise for building confident, effective and inspired teaching through sustained professional development activity over time. However, they do not support the view that mathematics, being just distilled common sense, can be taught without intense prior endeavor in the field.

Keywords: In-service mathematics teacher development, Knowledge base for teaching, Lesson study, Mathematics for teaching, Secondary mathematics teachers, Professional learning communities