

THE NATURE OF MATHEMATICS TEACHERS' REFLECTIVE PRACTICE

by

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Without the five mathematics teachers who agreed to share their teaching lives with me this research would not have been possible. Thank you for giving up your free afternoons for group reflections and the positive feedback I received from you towards the end of the research project. *An empowered teacher is a reflective decision-maker, who finds joy in learning and in investigating the teaching and learning process—one who views learning as construction and teaching as a facilitating process to enhance and enrich development* (Fosnot, 1989, p. xi).

Lastly, I dedicate this research study to my grandchildren, Ciska and Anoux.

Declaration

I hereby declare that this thesis submitted for the degree Doctor of Philosophy at the University of Pretoria, South Africa, is my own original work and has not been submitted for any degree or examination at any other institution of higher education. I further declare that all sources cited or quoted are indicated and acknowledged by means of a comprehensive list of references.

Anna Barbara Posthuma

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Summary

Thoughts about reflection and reflective practice have evolved over many decades, through carefully constructed theory and research applications, mainly based on the work of Dewey (1933) and Schön (1983). Evidence also exists in the literature that the ability to reflect on practice is considered a necessity for effective instruction (Sowder, 2007). By reflecting critically teachers become more positive in the search for a new understanding of their teaching practice and design more ways to deal with the challenges that confront them daily. When teachers act reflectively, they consider carefully the problems in their own teaching and think about how those problems are related to their educational or social context. They are aware of the consequences of their teaching and how their own assumptions or beliefs can influence their teaching.

This main purpose of my research study was to explore the nature of mathematics teachers' reflective practice in the context of lesson study. To achieve this aim, an in-depth exploration of five mathematics teachers' reflection before, during and after teaching a lesson was conducted. The possible relationship between these teachers' reflection and their classroom practice was also examined. The research also aimed to explore whether and how mathematics teachers' reflections differ from the conceptualisations of reflection in classroom practice as found in the literature. Contextual factors that might influence the nature of mathematics teachers' reflective practice were also investigated.

My findings indicate that the mathematics teachers in my sample have a limited understanding of the concept of reflection. Furthermore, based on lesson plan analysis, there was no evidence that these teachers reflect-for-action. However, they all reflected on-action verbally and in writing, and three of the five teachers reflected-in-action while teaching. They all reflected on Level R1 (recall level of reflection) and Level R2 (rationalisation level of reflection) and three teachers reflected critically on their learners' understanding of mathematics and their own teaching of concepts towards the end of the research project (Lee, 2005). Language and the lesson study group experience emerged as contextual factors that seemed to influence the teachers' reflection.

Although the research study's results cannot be generalised due to the small sample, I believe that through engaging in the lesson study experience the five teachers of this study

improved their reflective practice, reporting an increase in self-knowledge and finding new ways of teaching mathematics to learners.

Key words: Reflection; Reflective practice; Reflective thinking; Mathematics; Reflection-for-action; Reflection-in-action; Reflection-on-action.

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List of abbreviations

ACE	Advanced Certificate in Education
CPTD	Continuing Professional Teacher Development
BMI	Body Mass Index