Chapter 4

Modelling Teachers' Promotion of Powerful Positive Affect in the Primary Mathematics Classroom

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ABSTRACT

This chapter describes and analyses teachers' promotion of powerful positive affect in primary mathematics classrooms. A qualitative approach (Denzin & Lincoln, 2005) was used for the study described herein, which focused on the interactions between the participants; their thoughts, affect and actions, along with the identification of complex factors that facilitated and constrained their pedagogical change. The design of the study was founded on the argument that teachers significantly influence students' learning in the classroom; therefore, teachers' voices related to their learning and practices are central to the findings presented in this research. Cultural-Historical Activity Theory (Engeström, 1987, 1999) and the Stages of Concern (Hall & Hord, 2006) were applied in the analysis to understand teachers' adoption and development of tools that promote powerful positive affect. In conclusion, a conceptual model summarises the factors influencing teachers' work in this area.

INTRODUCTION

Teachers are central to the quality of teaching and learning experienced by students (Darling-Hammond, 2000; Hattie, 2003, 2009). Researchers claim that teachers are the most influential factor on student learning within the classroom (Hattie,

2003, 2009). Therefore, it seems important that teachers along with their experiences, perceptions, beliefs, and feelings are a key aspect of research on teaching. Within mathematics education, teachers are said to be "the public face" of the discipline and therefore have an important role in helping students to develop positive dispositions

towards the subject (Clarkson, Bishop, & Seah, 2010, p. 120).

Teachers' perspectives, knowledge, skills, and beliefs are often neglected within education research (Frade, Roesken, & Hannula, 2010; Groth & Bergner, 2007). This chapter focuses on teachers, and the process of their professional learning, along with the concerns and tensions they experienced as they promoted powerful positive affect in their mathematics classrooms. Concerns and tensions are factors that constrained teachers' promotion of powerful positive affect, whilst resolutions to these tensions supported teachers in the change process (Hall, 2010).

THE AFFECTIVE DOMAIN

There has been much interest in the affective domain in mathematics education research and in fact, researchers urge that "the affective domain cannot be ignored" (Schuck & Grootenboer, 2004, p. 66). It is widely accepted that the affective and cognitive domains are interconnected psychological constructs and educational research has, in particular, identified and focused on the affective domain as an important part of the teaching and learning process.

Theorising the affective domain has been a significant yet very difficult task for researchers. Further complicating this issue is that "no single theory of affect in mathematics education ... would accurately represent all relevant aspects of affect" (Hannula, 2006, p. 209). The ambiguous nature of the elements of the affective domain partnered with the fact that these terms have different meanings in psychology than in mathematics education (McLeod, 1992, p. 576) add to the complexities of this issue.

A number of authors have made significant attempts to define and clarify the affective domain since the 1980s, many of which are now highly valued and accepted in the field of education and psychology (Evans, 2006). According to a significant meta-summary of previous research on the affective domain conducted by McLeod (1992), "the affective domain refers to a wide range of beliefs, feelings and moods that are beyond the domain of cognition" (p. 576). Leder (2006) explained that affect "is often conceptualized in terms of attitudes, beliefs, values, emotions, and feelings" (p. 203). A common thread to all definitions is the complexity and multifaceted nature of the affective domain.

Although there has been a great deal of interest in, and research on, the elements of affect, they are often implicitly taught and unconsciously developed within the mathematics classroom. In contrast, we argue that there is a need for the explicit and holistic teaching of these elements, or in other words, explicit teaching of beliefs, emotions, attitudes and values that promote positive dispositions including engagement, mathematical success, and wellbeing.

Powerful Positive Affect and Wellbeing

Teachers' and students' affect are essential elements of mathematics teaching and learning (Grootenboer & Jorgensen, 2009; Niss, 2007). Ultimately, it seems that affective factors can foster mathematical success or contribute to failure. The focus of this chapter is on powerful positive affect: "patterns of affect [attitudes, beliefs, values, and feelings] … that foster children's intimate engagement, interest, concentration, persistence, and mathematical success" (Alston, Goldin, Jones, McCulloch, Rossman, & Schmeelk, 2007, p. 327). Powerful positive affect has the potential to be fundamental to students' participation in and enjoyment of mathematics.

Closely related to this notion of powerful positive affect is that of student wellbeing in mathematics. According to researchers, there is a current shift towards promoting student wellbeing in all teaching and learning (Clarkson et al., 2010; Department of Education and Children's Services,

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