

Preface

For many years mathematics has been seen as a dull and boring subject that has little relevance to *real life*, and seemingly these views develop at school. This book focuses on the beliefs, attitudes, values and emotions of students in Years 5–8 (aged 10–14 years) about mathematics and mathematics education. There has been considerable interest in the affective domain in mathematics education over the past two decades and many of the studies that have been with adult participants (often preservice primary teachers). While these studies have been useful in describing the beliefs, attitudes and feelings of people about mathematics, and highlighting the poor image of the subject amongst much of the population, there appears to be a shortage of research actually undertaken with children. If indeed people are developing many of their resistant views about mathematics during their schooling, then it is important to actually investigate students' affective views of mathematics while they are at school. Clearly, negative views of mathematics can detrimentally impact student's capacity to learn mathematics well at school and to use it effectively throughout their life. Conversely, students who are positively disposed towards mathematics are more likely to engage in mathematical activities and participate in opportunities that have a mathematical dimension.

Fundamentally, this book focuses on this topic—the development of affective views and responses towards mathematics and mathematics learning. Furthermore, it seems that students develop their more negative views of mathematics during the middle school years (Years 5–8), and so here we concentrate on students in these critical Years. This book is built on some empirical studies including qualitative enquiries with children in Years 5 and 8, and a large scale ($n = 1784$) quantitative study with students from a range of schools across diverse communities in New Zealand. While these studies were undertaken in a particular part of the world, the issues are common and have been reported across Australasia, Europe and the Americas, and so the findings have broad relevance and application. The studies revealed a number of key findings including:

- a view that mathematics is about numbers;
- the most important aspect of mathematics is learning your times-tables;

- students' emotional responses to mathematics and learning mathematics were related to their achievement and confidence;
- in general, the affective responses of students diminished as they moved up through the Years;
- there is a relationship between mathematical performance and attitudes to mathematics and beliefs about mathematics; and,
- despite the widespread high achievement of girls in mathematics, various groups of students expressed a view that "boys were better than girls" in mathematics.

The students' affective responses to mathematics—their beliefs, attitudes and feelings, were grounded in their experiences, and these experiences were confined primarily to the classroom. Given that students are learning their affective responses to mathematics in school mathematics lessons, and their views seem to be diminishing as they progress through their schooling, there is a need for a more holistic view of mathematics education in research, theory and practice—to consider the development of mathematical identities. This perspective promotes the simultaneous consideration of the mathematical development in knowledge, skills, beliefs and attitudes. Students with healthy mathematical identities usually achieve better results in mathematics courses, will engage more wholeheartedly in their mathematical learning, are more likely to continue with their studies in mathematics, and will more readily participate in mathematical experiences.

A feature of this book is that it brings some substantial empirically-based understandings to the widely held perception that many students have negative views of mathematics, and these affective responses develop during the middle years of school. Specifically, the data for this book were collected with school students, and students who were actually engaged in learning mathematics in their crucial middle school years. Therefore, the findings reported and discussed here are relevant for researchers and mathematics educators, policy makers and curriculum developers, and teachers and school leaders engaged in the teaching of mathematics.

Mathematics, Affect and Learning
Middle School Students' Beliefs and Attitudes About
Mathematics Education

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