

Debates in Mathematics Education

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Book Review by Irene Biza

This book discusses debates pertaining to the teaching and learning of mathematics at school level. It is written for those who will become schoolteachers, especially at the secondary level, and wish to gain more insight into teaching practices and how these practices are related to students' learning. It is structured in three sections that consider three areas of debate: (i) in the *social and political context* of mathematics education; (ii) in the *teaching and learning* of mathematics; and, (iii) in mathematics *curriculum and assessment*. The first section discusses topics such as the perception of mathematical ability (e.g. mathematical ability as something fixed or something that can change); the public perception of mathematics in popular culture (e.g. mathematics as a 'weird' or as a 'chic' domain); the role of mathematics in politics (e.g. the importance of mathematics as a component of democratic competences in topical cases such as the climate change debate); school mathematics and social stratification (e.g. how mathematics attainment reflects and/or maintains this stratification); mathematics and gender (e.g. what, if any, are the differences between female and male students); and, beliefs and expectations regarding mathematical ability (e.g. all students can do mathematics or not).

The second section discusses topics such as mental mathematics (e.g. 'in-the-head' way of thinking or 'with-the-head' way of thinking); use of technology (e.g. mathematics with or without calculator); the role of examples in mathematics teaching (e.g. well or not so well chosen examples); history of mathematics in education (e.g. in or out of the curriculum); the 'importance of teaching for understanding' (e.g. both functional or romantic views of understanding are a contestable issue); and, pedagogical approaches for equality in achievement (teaching for all or for few).

The third section discusses topics such as the history of the indented curriculum and the assessment structures in England (e.g. uniform curriculum for all the students or not); the aims of mathematics education (e.g. for future learning, i.e. A-level, HE, or for mathematical literacy); assessment for learning (e.g. target setting culture or personalisation); GCSE mathematics examinations (e.g. examinations should assess mathematics for further studies or for the work and life); and, choosing further mathematical studies (e.g. consideration of further mathematical studies is based on the educational system or on students identities).

The book responds nicely to the current demand of teacher education programmes for resources that bring together the knowledge of educators, teachers and educational policy makers. Each chapter includes questions for the reader's reflection on the key topics under consideration. These questions can be used as an individual activity for the reader to reflect on the issues discussed in the chapter mainly through his/her own experience. They can also trigger group discussion in the context of a session. The majority of the chapters draws on research literature, literature from policy documents (e.g. Ofsted), international comparison surveys (e.g. PISA, TIMSS) as well as publicly available sources of information on current affairs (such as newspaper analyses). Additionally, each

chapter offers, apart from the reference list, further readings accompanied by a brief description that helps the reader to identify which are the main points of each resource and why it is relevant to the corresponding chapter. I found this extremely helpful.

I can envisage some of the chapters being discussed together towards a more holistic view of teaching or learning phenomena. For example, the 'issue' of grouping students according to their ability is discussed from two different perspectives in Chapters One (by Mark Boylan and Hillary Povey) and Four (by Peter Gates and Andy Noyes): from the "ability" perspective that sees mathematical ability as something fixed that we are born with and from the "social class" perspective that sees mathematical ability as something defined by the environment we were born in. Later, Chapter 12 (by Hillary Povey) offers the teaching perspective on the same issue by suggesting pedagogical approaches for 'attainment for all'.

In my view most of the chapters offer a genuine critical position on key educational practices – particularly those on the use of technology, the emphasis on mental mathematics, setting in mathematics lessons etc. – by highlighting their complexity without offering quick fix prescriptions. I can see clearly the usefulness of this book, particularly for secondary mathematics teacher education courses. Also, I can see the use of some of the chapters – particularly those with less emphasis on details that are overly specific to the English educational context – as useful in mathematics education modules at BSc, BA, MSc and MA programmes. A mild 'health warning': the slightly over-casual style of writing in some of the chapters (e.g. use of first names instead of surnames to refer to other studies or chapters in the book) should not distract from the thoroughness with which this worthy volume has been put together.