Book review

Where's the "math" in "mathematics education"? Review of "Mathematics and mathematics education: searching for common ground"

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Fried, M. N. & Dreyfus, T. (Eds.) (2014). *Mathematics and mathematics education: searching for common ground*. Dordrecht: Springer. doi: 10.1007/978-94-007-7473-5

This book is a tribute to Ted Eisenberg and emerged from a symposium held in 2012 at Ben-Gurion University of the Negev on the occasion of his retirement concerning the growing division between mathematics and mathematics education, which was a concern of his over the years. If there is any reader who is unfamiliar with Eisenberg's work, the book contains an annotated bibliography of his major publications (see pp. 357–358).

The divide between mathematics and mathematics education discussed in the book makes a lot of sense to the reader as it manifests in different ways and contexts. For example, at the level of communities of mathematicians and researchers in mathematics education, a mutual apathy about the contributions that their members can make to improve mathematics education may arise; the divide can also be perceived in the current state of development of research in mathematics education, where at times the presence of mathematics content seems to be diluted or taking a non-central but peripheral role in the focus of research.

Michael N. Fried rightly points out that "the divide between the two communities is wasteful and unhealthy for both" (p. 4); thus, one of the expected contributions of the book is to show the benefits that the strengthening of the natural links between the communities of mathematicians and mathematics educators would produce for both of them. By identifying areas of commonality as well as disagreement, the book

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aims to build the basis for further rapprochement between the two communities. Eight areas of commonality and disagreement are identified in the book, which are the sections in the book: mutual expectations between mathematics and mathematics education, history of mathematics, problem solving, mathematical literacy, visualization, justification and proof, policy and collaboration between mathematics and mathematics education. Each of these sections is composed of manuscripts developed by mathematicians and mathematics educators, although the number of mathematics educator authors is greater than the number of mathematician authors, which produces a book that could be more accessible to readers from the field of mathematics education.

Highlights of the book

The eight sections listed above are preceded by an introduction and a section called "Dialogue on a dialogue", which is composed of three chapters: one by Fried, one by Eisenberg and the third by Norma Presmeg. This is certainly one of my favourite parts of the book.

"Dialogue on a dialogue" presents a scholarly dialogue focused on the current state of mathematics education, particularly on the role of mathematics as a discipline in mathematics education. This dialogue contains different views on the issue, as Fried mentions in Chapter 1:

> Presmeg had argued that since the purview of mathematics education includes more than mathematical content *per se* – that it concerns how students think about mathematics, how mathematics becomes part of students' inner and outer lives, how it is integrated into students' sociocultural world, for example – it is necessarily a multidisciplinary subject. Eisenberg, in particular, felt in the course of broadening mathematics education in this way, mathematical content was in fact becoming lost. (p. 16)

Although this dialogue is based on a prior exchange between the same interlocutors published in *ZDM – The International Journal on Mathematics Education* (see volume 41, issue 1-2, January 2009), this new dialogue complements and extends what was previously said.

I find particularly impassioned, challenging and thought-provoking the third chapter by Eisenberg. He is one of the fiercest critics of the current state of mathematics education that I have read; however, it is clear to me that Eisenberg has a point when he criticises, for example, the absence of mathematics in research journals in mathematics education, the frail mathematical background of some mathematics educators and the peripheral role that mathematics itself can take in current research on mathematics education.

Another aspect of the book that I would like to highlight is the fact that it brings together leading and experienced authors, which as a result generates some very interesting chapters. Some of these chapters resemble a literature review in the sense that they offer an overview of the state of development of certain areas of research in mathematics education (see for example Chapter 11 about visualization in mathematics education by McKenzie (Ken) A. Clements); this feature, coupled with the fact that the book deals with eight different themes, produces a book that will certainly contribute to the enrichment of the general culture of the reader about mathematics education as a research field.

Since this review is published in a Nordic journal, it is pertinent to address the contribution that the authors from this region made to this book. There are two Nordic authors who contributed to the book: Mogens Niss from Roskilde University in Denmark and Jonas Emanuelsson from the University of Gothenburg in Sweden. Both authors contributed to the "Policy" section of the book. Niss opens this section with a chapter entitled "Mathematics and mathematics education policy" in which he presents a framework consisting of the concepts of policy, policymakers and policy agents; he uses this framework to postulate, argue and even provide plausible explanations for the main point of his chapter, which relates to an aspect of the divide between mathematics and mathematics education:

> that for some actually existing policy agents and policy makers, the positions they take on key issues in mathematics education policy are deeply linked to views and perceptions of mathematics as a discipline, in and of itself and in its relations to the society and to the world in general. (p. 274)

In turn Emanuelsson addresses the issue of policy from another angle: mathematics teacher education. A central idea in his contribution is "that the professional object of mathematics teacher is better viewed as the teaching and learning of mathematics rather than viewed as mathematics in itself" (p. 281). Therefore, Emanuelsson suggests that the training of mathematics teachers, and the policy regulating such training, should support teachers' building knowledge about how students understand mathematics.

Two observations on the content

On page 4 it is mentioned that although the editors tried to maintain some uniformity in the format of the book, they allowed considerable freedom in other aspects as part of the recognition of the differences between the communities of mathematicians and mathematics education

researchers. I do not know if it was because of this freedom or perhaps due to the difficulty that editing a book with many authors imposes, but I had moments as a reader where I asked myself: how is the content of this chapter related to the divide between mathematics and mathematics education? In other words, there are some chapters in the book that do not seem to contribute nor be connected to the central discussion of the volume.

Another element that I as a reader missed in the book was the inclusion of other voices that have discussed the specificity of mathematics in mathematics education research. I am sure that the discussion on the role of mathematics in mathematics education research could have been enriched with comments like those by Alexandre Pais and Paola Valero, who have provided arguments to assert that it is important to consider in mathematics education research the social, political and cultural aspects that influence mathematics education as an educational practice (see for example Pais & Valero, 2012). Unfortunately, these voices were not included.

A final comment

I think one of the main contributions of this book is to put on the table the issue of the divide between mathematics and mathematics education and to suggest and illustrate ways in which these two communities could strengthen their interaction and collaboration (Chapter 17 by Hyman Bass and Deborah Loewenberg Ball is an example of successful collaboration between members of these communities).

Personally, this book has triggered many reflections about the role and presence that mathematics has in our discipline and in my own research. This is one of the main reasons why I recommend that other *mathematics educators* read this book, paying particular attention to the points raised in the section "Dialogue on a dialogue". In my recommendation I emphasize the expression "mathematics educators" because, as I mentioned earlier, I think this is a book that could be more accessible to readers from the field of mathematics education. As noted by Paola Iannone (2014), the book "is written predominantly in the language of mathematics education" (p. 333), which could hinder its reading by members of the community of mathematicians unfamiliar with this particular language.

One of the points of the book that struck me most is the questioning of the role of mathematics in mathematics education. After reading the book I consciously acknowledge that in the field of mathematics education there is research in which mathematical content plays a central

role, but there is also research in which mathematics take a peripheral role. However, I personally do not see this feature as a problem; I think this is a characteristic of our discipline and, moreover, several of those investigations where mathematics takes a peripheral role are necessary to sustain the development, evolution and relevance of our discipline.

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