Introduction

A Synthesized and Forward-Oriented Case for Mathematics Education

We take this opportunity to offer a few remarks on the background and motivation for this edited collection of chapters that aim to seek new frontiers for theories of mathematics education. This book grew out of the 29th meeting of the International Group of the Psychology of Mathematics Education (PME) in Melbourne, 2005, where we co-organized a research forum on theories of mathematics education (see English and Sriraman 2005). This led to our production of two ZDM issues on theories of mathematics education, which consisted of extended versions of the papers presented at the research forum in addition to complementary theoretical perspectives that were not present in the forum (see Sriraman and English 2005, 2006). Numerous handbooks have been published since 2005 that have provided grist for the theoretical foundations of our field (e.g., Alexander and Winne 2006; Campbell 2005; English et al. 2008; Lester 2007), and suggest that the identity of our field is continually developing (Sriraman 2009). There are newer developments in numerous areas within mathematics education such as complexity theory, neurosciences, critical theory, feminist theory, social justice theory, networking theories, and semiotics. This first book in the new Springer series Advances in Mathematics Education is the ideal platform to take an avant garde look at theories of mathematics education, using the two ZDM issues on theories as a point of departure. The book synthesizes the past and orients towards newer frontiers by synergizing areas that have been developing rapidly in the last five years.

After 13 months of very intense activity with the cast of 50+ contributing authors, we have finally succeeded in bringing together a substantial book on theories of mathematics education. The task was by no means easy given the extremely tight deadline; indeed the book would not have been possible without the excellent cooperation of each and every author. The book comprises of 19 parts consisting of 59 prefaces, chapters and commentaries, with ∼30% of the chapters coming from the two previous ZDM issues on theories (Sriraman and English 2005, 2006). The chapter by Judith Jacobs on feminist pedagogy comes from a 1994 issue of ZDM, and the chapter by Gerald Goldin on problem solving heuristics, affect, and discrete mathematics comes from a 2004 issue of ZDM.
However, many of these chapters have been reworked by the authors and/or include new prefaces and commentaries. In many cases these older chapters also include two or more commentaries that critically examine the ideas presented, analyze their relevance for the field today, and suggest a way forward. For instance the chapter by Jacobs has a new preface and three commentaries that examine the significance of Jacobs' ideas of feminist pedagogy, in light of research findings on gender and mathematics a decade and a half later from Australia, Turkey, and Iceland. Similarly the chapter by Goldin includes a contemporary commentary from Jinfa Cai and the Lesh and Sriraman chapter on mathematics education as a design science receives critical commentaries from authors in Israel, Denmark, and the U.S.

The cynical reader might ask, what is so special about this particular book in comparison to the numerous other books that are published. The style of preface and commentaries is both analytic (analysis of ideas presented) and synthetic (making it cohere in the larger scheme of things). This allows for theoretical ideas presented to be discussed fully and taken in directions different from the authors. The book also contains the voices of multi generations of mathematics educators, including those that have been around since the major research journals were founded in the late 1960’s, the numerous movers and shakers of paradigms, researchers coming from very different theoretical backgrounds, and newer voices in the fledgling areas of complexity, neuroscience, aesthetics and networking theories. This book consisting of 19 parts, 17 prefaces and 23 commentaries synergizes the efforts of numerous groups across the globe in the ongoing debates on theory development in mathematics education. The book presents a good case that theory development is indeed progressing on different geographical and trans-disciplinary fronts, and our field has indeed consolidated and synthesized previous work and moved forward in unimagined and productive ways.

We would like to thank the editorial board for its input on various manuscripts, and the very large cast of ad-hoc reviewers that include most of the book authors. Last but not least we acknowledge the unwavering support of Heine Clemens at Springer Berlin/Heidelberg with developing the larger concept and scope of this book and all matters related to publishing logistics, as well as Gabriele Kaiser for her faith and solidarity in this endeavor.

Acknowledgements The first editor (Sriraman) would like to thank the Sabbatical and Faculty Exchange Program of The University of Montana for providing the time and support necessary for completing this monumental endeavor. In addition, a whole hearted thank you to Lyn English for her mentorship and expertise in the art of editing. This book would not have materialized without her superb talent and guidance.

Bharath Sriraman
Lyn English

References


Theories of Mathematics Education
Seeking New Frontiers
Sriraman, B.; English, L. (Eds.)
2010, XXX, 668 p. 34 illus., Hardcover
ISBN: 978-3-642-00741-5