
CONTENTS

Preface	xi
Acknowledgements	xiv

Part I: Foundations

1. Putting Philosophy to Work: Coping With Multiple Theoretical Perspectives	3
<i>Paul Cobb, Vanderbilt University</i>	
2. Theory in Mathematics Education Scholarship	39
<i>Edward A. Silver & Patricio G. Herbst, University of Michigan</i>	
3. Method	69
<i>Alan H. Schoenfeld, University of California, Berkeley</i>	

Part II: Teachers and Teaching

4. Assessing Teachers' Mathematical Knowledge: What Knowledge Matters	111
and What Evidence Counts?	
<i>Heather C. Hill, Laurie Sleep, Jennifer M. Lewis, & Deborah Loewenberg Ball, University of Michigan</i>	
5. The Mathematical Education and Development of Teachers	157
<i>Judith T. Sowder, San Diego State University</i>	
6. Understanding Teaching and Classroom Practice in Mathematics	225
<i>Megan Loef Franke, University of California, Los Angeles</i>	
<i>Elham Kazemi, University of Washington</i>	
<i>Daniel Battey, Arizona State University</i>	
7. Mathematics Teachers' Beliefs and Affect	257
<i>Randolph A. Philipp, San Diego State University</i>	

Part III: Influences on Student Outcomes

8. How Curriculum Influences Student Learning	319
<i>Mary Kay Stein, University of Pittsburgh</i>	
<i>Janine Remillard, University of Pennsylvania</i>	
<i>Margaret S. Smith, University of Pittsburgh</i>	
9. The Effects of Classroom Mathematics Teaching on Students' Learning	371
<i>James S. Hiebert, University of Delaware</i>	
<i>Douglas A. Grouws, University of Missouri</i>	
10. Culture, Race, Power, and Mathematics Education	405
<i>Diversity in Mathematics Education Center for Learning and Teaching</i>	
11. The Role of Culture in Teaching and Learning Mathematics	435
<i>Norma G. Presmeg, Illinois State University</i>	

Part IV: Students and Learning

12. Early Childhood Mathematics Learning 461
Douglas H., Clements & Julie Sarama, University at Buffalo, State University of New York
13. Whole Number Concepts and Operations..... 557
Lieven Verschaffel, University of Leuven
Brian Greer, Portland State University
Erik DeCorte, University of Leuven
14. Rational Numbers and Proportional Reasoning: Toward a Theoretical Framework 629
for Research
Susan J. Lamon, Marquette University
15. Early Algebra 669
David W. Carraher, TERC
Analucia D. Schliemann, Tufts University
16. Learning and Teaching of Algebra at the Middle School through College Levels: 707
Building Meaning for Symbols and Their Manipulation
Carolyn Kieran, Université du Québec à Montréal
17. Problem Solving and Modeling..... 763
Richard Lesh, Indiana University
Judith Zawojewski, Illinois Institute of Technology
18. Toward Comprehensive Perspectives on the Learning and Teaching of Proof..... 805
Guershon Harel, University of California, San Diego
Larry Sowder, San Diego State University
19. The Development of Geometric and Spatial Thinking 843
Michael T. Battista, Michigan State University
20. Research in Probability: Responding to Classroom Realities 909
Graham A. Jones, Griffith University, Gold Coast Campus
Cynthia W. Langrall, & Edward S. Mooney, Illinois State University
21. Research on Statistics Learning and Reasoning 957
J. Michael Shaughnessy, Portland State University
22. Mathematics Thinking and Learning at Post-secondary Level 1011
Michèle Artigue, Université Paris 7
Carmen Batanero, Universidad de Granada
Phillip Kent, University of London

Part V: Assessment

23. Keeping Learning on Track: Classroom Assessment and the Regulation of Learning 1051
Dylan William, University of London
24. High Stakes Testing in Mathematics 1099
Linda Dager Wilson
25. Large-scale Assessment of Mathematics Education 1111
Jan de Lange, Freudenthal Institute

Part VI: Issues and Perspectives

26.	Issues in Access and Equity in Mathematics Education	1145
	<i>Alan J. Bishop & Helen J. Forgasz, Monash University</i>	
27.	Research on Technology in Mathematics Education: The Perspective of Constructs.....	1169
	<i>Rose Mary Zbiek, M. Kathleen Heid, & Glendon Blume, Pennsylvania State University</i> <i>Thomas P. Dick, Oregon State University</i>	
28.	Engineering Change in Mathematics Education: Research, Policy, and Practice	1209
	<i>William F. Tate, Washington University in St. Louis</i> <i>Celia Rousseau, University of Memphis</i>	
29.	Educational Policy Research and Mathematics Education	1247
	<i>Joan Ferrini-Mundy & Robert Floden, Michigan State University</i>	
30.	Mathematics Content Specification in the Age of Assessment	1281
	<i>Norman L. Webb, University of Wisconsin, Madison</i>	
31.	Reflections on the State and Trends in Research on Mathematics Teaching and Learning:	1293
	From Here to Utopia <i>Mogens Niss, Roskilde University</i>	
	About the Contributors	1313
	Author Index.....	I-1
	Subject Index	I-27