

Contents

Part I Pre-service Teachers' Mathematics-Content and Mathematics-Specific Pedagogical Preparation

- 1 Using Mathematics-Pedagogy Tasks to Facilitate the Professional Growth of Pre-service Elementary Teachers 3**
Fou-Lai Lin and Hui-Yu Hsu
- 2 Investigating the Relationship Between Prospective Elementary Teachers' Math-Specific Knowledge Domains 19**
Roland Pilous, Timo Leuders and Christian Rüede
- 3 A Self-study of Integrating Computer Technology in a Geometry Course for Prospective Elementary Teachers 37**
Jane-Jane Lo
- 4 Pre-service Elementary Teachers' Generation of Multiple Representations to Word Problems Involving Proportions 55**
Ryan D. Fox
- 5 Pre-service Teachers' Mathematics-Content and Mathematics-Specific Pedagogical Preparation 71**
Ana Donevska-Todorova, Martin Guljamow and Katja Eilerts

Part II Professional Growth Through Activities and Assessment Tools Used in Mathematics Teacher Preparation Programs

- 6 Preparing Elementary School Teachers of Mathematics: A Continuing Challenge 83**
Francis (Skip) Fennell
- 7 Designing Non-routine Mathematical Problems as a Challenge for High Performing Prospective Teachers 97**
Marjolein Kool and Ronald Keijzer

8	Pre-service Teacher Procedural and Conceptual Knowledge of Fractions	111
	Eda Vula and Jeta Kingji-Kastrati	
9	Designing Simulations to Learn About Pre-service Teachers' Capabilities with Eliciting and Interpreting Student Thinking	125
	Meghan Shaughnessy and Timothy Boerst	
10	Professional Growth Through Activities and Assessment Tools Used in Mathematics Teacher Preparation Programs	141
	JeongSuk Pang	

Part III Pre-service Mathematics Teachers' Knowledge and Beliefs

11	An Investigation of Prospective Elementary Teachers' Argumentation from the Perspective of Mathematical Knowledge for Teaching and Evaluating	155
	Yusuke Shinno, Tomoko Yanagimoto and Katsuhiro Uno	
12	The Mathematics Backgrounds and Mathematics Self-efficacy Perceptions of Pre-service Elementary School Teachers	171
	Gönül Güneş	
13	Mathematics Teachers' Knowledge and Productive Disposition for Teaching: A Framework and Measure	187
	Erik Jacobson, Fetiye Aydeniz, Mark Creager, Michael Daiga and Erol Uzan	
14	Prospective Mathematics Teachers' Opinions About Their Opportunities for Learning How to Teach to a Diverse Group of Students	205
	Derya Çelik, Serhat Aydın, Zeynep Medine Özmen, Kadir Gürsoy, Duygu Arabacı, Mustafa Güler, Gökay Açıkyıldız, Gönül Güneş, Ramazan Gürbüz and Osman Birgin	
15	Pre-service Mathematics Teachers' Knowledge and Beliefs	219
	Andreas J. Stylianides and Seán Delaney	

Part IV Perspectives on Noticing in the Preparation of Elementary Mathematics Teachers

16	Learning to Act in-the-Moment: Prospective Elementary Teachers' Role-Playing on Numbers	231
	Caroline Lajoie	
17	The Role of Writing Narratives in Developing Pre-service Elementary Teachers' Noticing	245
	Pedro Ivars and Ceneida Fernández	

18 Noticing and Deciding the Next Steps for Teaching: A Cross-University Study with Elementary Pre-service Teachers 261
Dittika Gupta, Melissa Soto, Lara Dick, Shawn D. Broderick
and Mollie Appelgate

19 Understanding the Work of Mathematics Teacher Educators from a Knowledge of Practice Perspective 277
Wenjuan Li and Alison Castro Superfine

20 Perspectives on Noticing in the Preparation of Elementary Mathematics Teachers. 293
David K. Pugalee

Index 303



<http://www.springer.com/978-3-319-68341-6>

Research Advances in the Mathematical Education of
Pre-service Elementary Teachers

An International Perspective

Stylianides, G.J.; Hino, K. (Eds.)

2018, XI, 304 p. 48 illus., Hardcover

ISBN: 978-3-319-68341-6