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Nota di contenuto	Preface -- Chapter 1. State of the Art on Mathematical Modelling in Mathematics Education – Lines of Inquiry -- Chapter 2. Towards a Framework for a Dialectical Relationship between Pedagogical Practice and Research -- Chapter 3. Interplay between Research and Development of Teaching Practices in Mathematical Modelling -- Chapter 4. Establishing the Construct: Task Context -- Chapter 5. Approaches to Investigating Complex Dynamical Systems -- Chapter 6. Precision, Priorities, and Proxies in Mathematical Modelling -- Chapter 7. A Modelling Perspective on Students' Reasoning: From a Mathematical Model to a Motion Model -- Chapter 8. Teachers as Learners: Understanding and Valuing Mathematical Modelling through Professional Development -- Chapter 9. Assessing Sub-Competencies of Mathematical Modelling with the Help of Item Response Theory – Presentation of a New Test Instrument -- Chapter 10. The Influence of Technology on the Mathematical Modelling of Physical Phenomena --

Chapter 11. Adapting a Cognitive Tool for Representing Prospective and Practicing Teachers' Interpretations of Students' Modelling Activities -- Chapter 12. Heuristic Strategies in Modelling Problems -- Chapter 13. The Impact of Task Authenticity on Students' Mathematical Modelling Process -- Chapter 14. Children with Mathematical Difficulties Cope with Modelling Tasks: The Case of Sami -- Chapter 15. Data modelling -- Chapter 16. Conclusions and Future Lines of Inquiry in Mathematical Modelling Research in Education -- Index.

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Sommario/riassunto

This open access book is based on selected presentations from Topic Study Group 21: Mathematical Applications and Modelling in the Teaching and Learning of Mathematics at the 13th International Congress on Mathematical Education (ICME 13), held in Hamburg, Germany on July 24–31, 2016. It contributes to the theory, research and teaching practice concerning this key topic by taking into account the importance of relations between mathematics and the real world. Further, the book addresses the “balancing act” between developing students’ modelling skills on the one hand, and using modelling to help them learn mathematics on the other, which arises from the integration of modelling into classrooms. The contributions, prepared by authors from 9 countries, reflect the spectrum of international debates on the topic, and the examples presented span schooling from years 1 to 12, teacher education, and teaching modelling at the tertiary level. In addition the book highlights professional learning and development for in-service teachers, particularly in systems where the introduction of modelling into curricula means reassessing how mathematics is taught. Given its scope, the book will appeal to researchers and teacher educators in mathematics education, as well as pre-service teachers and school and university educators.

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