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Nota di contenuto	Part I: Development of Physics teaching and learning in schools -- 1 Newton's Apple And Einstein's Timewarp, New Ideas In Teaching Gravity, Warren Stannard -- 2 Using The Electron-Gas Model In Lower Secondary Schools - A Binational Design-Based Research Project, Claudia Haagen-Schützenhöfer -- 3 The Virtual Sandbox An Approach To Introduce Principles Of Granular Flow Physics In The Classroom, Olga Gkioka -- 4 Three Stories, Three Toolkits: Magnetize Attention, Light Up Coloured Ideas, Gas Fantasy Into Science, Sara Roberta Barbieri -- 5 Mathematics - A Quasi-Natural Science At School?, Eduard Krause

-- Part II: Innovation in Undergraduate Physics Education -- 6 A 5E-Based Learning Workshop on Various Aspects of the Hall Effect, Dominique Persano-Adorno -- 7 The Broken Mirror: The Foundations of Thermodynamics and the Failure of Mathematics to Reflect the Physics, David Sands -- 8 Computer Modelling in Physics Education: Dealing with Complexity, Onne van Buuren -- 9 Development of Data Processing Skills of Physics Students in Intermediate Laboratory Courses, Inkeri Kontro -- 10 Evaluation Of An Experimental Sequence On Introductory Quantum Physics Based On Leds And The Photoelectric Effect., Massimiliano Malgieri -- 11 The Role Of Playing In The Representation Of The Concept Of Energy: A Lab Experience For Future Primary School Teachers, Alessandra Landini -- Part III: Trends in Physics Teacher Education -- 12 Development and Assessment of Inquiry Skills in the Context of Socioscientific Issues with Pre-Service Teachers, Ruth Chadwick -- 13 Responsibility of Teachers – The SSIBL Model in Hungary, Prof. Péter Tasnádi -- 14 Using Self-Video-Based Conversations in Training Physics Teachers, Yaron Lehavi -- 15 A Workshop Approach to Pre-Service Physics Teacher Education, Paul van Kampen -- 16 Views and Strategies of Teachers Concerning the Role of Mathematics and Physics in Physics Lessons, Gesche Pospiech -- Part IV: Bridging gaps in student motivation and engagement in Physics -- 17 Project Accelerate: Closing The Access Gap To Physical Science Careers And Academic Programs, Mark D. Greenman -- 18 “There Are No Things Inside Things”: An Augmented Lecture To Bridge The Gap Between Formal And Informal Physics Education, Marco Giliberti -- 19 Pedagogical Strategies To Increase Students’ Engagement And Motivation, Claudia De Grandi -- 20. The Dust Catcher: Discovering The Educational Value Of The Historical Scientific Heritage, Marta Rinaudo.

Sommario/riassunto

This book discusses novel research on and practices in the field of physics teaching and learning. It gathers selected high-quality studies that were presented at the GIREP-ICPE-EPEC 2017 conference, which was jointly organised by the International Research Group on Physics Teaching (GIREP); European Physical Society – Physics Education Division, and the Physics Education Commission of the International Union of Pure and Applied Physics (IUPAP). The respective chapters address a wide variety of topics and approaches, pursued in various contexts and settings, all of which represent valuable contributions to the field of physics education research. Examples include the design of curricula and strategies to develop student competencies—including knowledge, skills, attitudes and values; workshop approaches to teacher education; and pedagogical strategies used to engage and motivate students. This book shares essential insights into current research on physics education and will be of interest to physics teachers, teacher educators and physics education researchers around the world who are working to combine research and practice in physics teaching and learning. .