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Altri autori (Persone)	MicheliniMarisa EspositoSalvatore
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Nota di contenuto	Physics Education Research in Italy -- First experimentation of higher educational tools for an embodied and creative education on energy -- Teaching quantum information science at secondary school with photon polarization- and which path encoded qubits -- A didactic pathway on the concept of energy in primary school cognitive well being and self efficacy based on gender -- Investigating Undergraduate Students Identification With Physics Through Structural Equation Modeling -- Can Old Quantum Theoretical description of Physical Reality be considered worth teaching -- Design of a teaching and learning sequence on surface phenomena for university education -- Laboratory experience of optical reflection in a circular cavity -- Recent perspectives in physics education through the adoption of hardware and software technologies in the laboratory -- The wave model of light

according to the interpretation of diffraction and spectroscopy phenomena by upper secondary school students.

Sommario/riassunto

This book presents a selection of the most recent research results from the Italian physics education research community, aimed at enhancing the teaching and learning of physics. The motivation for this publication arises from the lack of a comprehensive reference for teachers on research results in physics education. Despite various physics curriculum reform initiatives, such as the introduction of modern physics into high school curricula, their effectiveness in improving the quality of physics teaching in schools has been limited. The book offers a contextualized view of the main topics in physics education, along with a comprehensive overview of the current challenges faced by physics education in Italy and abroad. It also presents research findings that could potentially enhance students' learning of physics. Throughout the book, the implications of these studies are outlined, acknowledging issues and knowledge gaps that will guide future research in physics education. Specifically, rather than covering all the contents addressed in the physics curriculum, the book presents research contributions that suggest potentially effective strategies, methods, and practices at different school levels, from primary school to secondary school and university level. Regarding physics content, the book presents teaching proposals highlighting conceptual aspects and exemplary methodologies of interpretation in physics, such as the physics of fluids and quantum mechanics. It also includes research contributions on different methods and proposals for implementing practical activities, reflecting on the role of the laboratory in learning the discipline and providing examples of integrating experimental and cognitive skills. The book also addresses the role of affective variables, such as physics identity, self-efficacy, and attitudes toward physics in the learning process. Additionally, studies on teachers’ professional development are presented, which can inform the design of proposals for educational paths and methods, within a framework of close collaboration between schools and physics departments.