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Sommario/riassunto

This book synthesizes theoretical perspectives, empirical evidence and practical strategies for improving teacher education in chemistry. Many chemistry lessons involve mindless "cookbook" activities where students and teachers follow recipes, memorise formulae and recall facts without understanding how and why knowledge in chemistry works. Capitalising on traditionally disparate areas of research, the book investigates how to make chemistry education more meaningful for both students and teachers. It provides an example of how theory and practice in chemistry education can be bridged. It reflects on the nature of knowledge in chemistry by referring to theoretical perspectives from philosophy of chemistry. It draws on empirical evidence from research on teacher education, and illustrates concrete strategies and resources that can be used by teacher educators. The

book describes the design and implementation of an innovative teacher education project to show the impact of an intervention on pre-service teachers. The book shows how, by making use of visual representations and analogies, the project makes some fairly abstract and complex ideas accessible to pre-service teachers. Endorsement 1: Teaching and learning with history and philosophy of chemistry has been, and continues to be, supported by science educators. While science education standards documents in many countries also stress the importance of teaching and learning the approach still suffers from ineffective implementation in school science teaching. This book by two experienced chemistry education educators is an important, valid, and usable addition to all those who are involved in teaching and learning chemistry in both secondary and tertiary educational levels. The book is also a good contribution for presenting the readers the evolution of chemistry knowledge. Professor Avi Hofstein, Emeritus Professor of Chemistry Education, The Weizmann Institute of Science, Israel Endorsement 2: This book is helpful for teachers to reinforce and clarify their own understanding of philosophical arguments in chemistry concepts. I would definitely use this book in preparing both my pre-service and in-service teachers to teach chemistry because it brings philosophical arguments into tangible focus. It offers teacher educators clear approaches to organizing this very deep type of instruction. The interviews and sample drawings helps instructors to anticipate concepts that may be difficult, and they provide teachers with a sense of what to expect from their learners when engaged in understanding epistemic foundations of chemistry. Professor Erin Peters Burton, Director of Center for Social Equity through Science Education, George Mason University, USA.