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COLUMN: BOOK REVIEW

Herring, M.C., Koehler, M.J., & Mishra, P. (Eds.) (2016). *Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators*. (2nd edition). New York: Routledge

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Koehler and Mishra introduced TPACK –Technological Pedagogical and Content Knowledge – in 2005 as model for promoting and understanding the integration of technology in educational settings, primarily in schools and in pre-service teacher education programs. Over time it has become a prominent framework for use by educational practitioners and researchers seeking to enrich the field of educational technology. As described by the editors in the introduction, TPACK serves as a lens by which we can make sense of "technology integration as the interplay between technology, pedagogy, and content" (p. 4).

This handbook serves as a scholarly resource for higher education faculty and graduate students seeking to grasp the underpinnings and findings of research on the TPACK framework for integrating technology within instructional contexts. The greatest value of the book is to those seeking to develop their own research utilizing the model, with each contributed chapter providing source material on all aspects of TPACK as applied to educational research.

The editors break the book into three sections, beginning with theory, followed by research methods and designs, and finishing with studies in practical application of the model. Each section contains contributed chapters from forty-five TPACK scholars, written as stand-alone articles. The breadth of the content is the most valuable aspect of the handbook, covering a wide variety of research designs and contexts.

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Chapter 1 is an overview of the book, including its organization, by the editors. The initial section provides readers with three chapters on the theories that undergird the TPACK model. It begins with a historical placement of TPACK as answering the need to develop a technology integration framework to better understand the interchange between technology and pedagogical practice in educational settings. Chapter 2 is a history of the model from inception through its growth as a useful framework. It also contains discussions of questions as to the value of TPACK, what type of model it represents. Is TPACK generic or specific in terms of domain? Does it serve to integrate what we know about technology and learning, or is it transforming our conception of that relationship? Where does it fit in the overall body of scholarship on technology integration? The chapters work well to give one the baseline knowledge of the model, in order to use it in analyzing appropriate research questions.

The second section examines the research designs and analysis methods TPACK supports. Perhaps the most valuable chapters to researchers are 5 and 6, which taken together are a comparison of the model as a tool for both qualitative and quantitative studies. Anyone embarking on a research study with TPACK would be well served to carefully read these chapters, as both provide excellent rationales for the efficacy of TPACK within different research methodologies. The authors of the two chapters, Archambault for qualitative and Chai, Koh and Tsai for quantitative, organize by methodologies and give examples of the data gathering tools and analysis methods found in articles reporting TPACK research.

Chapters 7 through 10 give examples of the use of TPACK as the basis for research in teacher education, online learning and universal design for learning.

Chapters 11 through 20 comprise roughly half of the book and the entire final section on TPACK in practice. The first six chapters of the section are evidence-based rationales for

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TPACK use in K-12 school and higher education settings including supporting teacher adoption and the design of learning tools. These chapters give the reader a deeper understanding of the issues and value of TPACK in each context. The last four chapters focus down to specific domains for practice based in the model. Mathematics and science teaching are joined by music and language arts to cover possible curricular adaptations that TPACK can afford educators.

The style of this handbook is that of a compendium of separate writings with each chapter standing alone. Thus scholars can choose chapters that apply best to their work and seek understanding of the TPACK model as it pertains to their research questions. Taken as a whole, it attempts to cover the full range of TPACK as a model for developing educational research and practice into technology integration. In this it succeeds and that is the positive contribution of this book to furthering research on the efficacy of the TPACK model as a framework for analyzing educational technology applications.

The value for educational practitioners is perhaps less obvious, though not entirely missing. In most chapters that deal with practice there are examples of applying the TPACK model to instructional approaches, or to design technology projects. The chapter on the use of TPACK to design professional development for science teachers does this well by describing how the model guided the design of the sessions offered to participants. Similarly the use of TPACK in guiding pre-service teacher development is noted in several chapters that deal with specific initiatives. For those who teach with or about instructional technology at any level the book can inform their efforts.

The book could serve as a primer on the TPACK model though it does not appear to have been the goal of the authors to make it one. The early chapters do an excellent job of providing the baseline for the framework's creation and subsequent growth as a model, and set the stage for the rest of the book. While valuable to researchers, graduate students and practitioners, we would not recommend the book for use in pre-service teacher education classes as the majority of the book is dedicated to the theoretical review and research on TPACK.

Having designed pre-service and graduate courses using the TPACK model and applied the model in our scholarship, we found the book provided us with insight, clarity, and inspiration for future use. As noted the chapters on qualitative and quantitative research were of particular value as prompts for designing our future studies and measurement instruments. Those working in pre-service teacher education programs will find Judith Harris' Chapter 12 and Chapter 13 contributed by Herring, Meacham and Mourlam highly informative for instructional design, curricular decisions and program assessment of technology integration. Anyone with an advanced academic interest in TPACK should find something in the handbook that will enhance understanding of the model.