Chapter 7

Introduction to Teachers' Knowledge-of-Practice for Teaching With Digital Technologies:
A Technological Pedagogical Content Knowledge (TPACK) Framework

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ABSTRACT

Technological pedagogical content knowledge (TPACK) is a dynamic theoretical description of teachers' knowledge for designing, implementing, and evaluating curriculum and instruction with digital technologies. TPACK portrays the complex interaction among content knowledge, pedagogical knowledge and technological knowledge for guiding teachers in the strategic thinking of when, where, and how to direct students' learning with technologies. Teacher educators' and educational researchers' acceptance of the TPACK construct mirrors the acceptance of its parent construct of pedagogical content knowledge (PCK). The importance of teachers' continued practice in integrating technologies is essential for extending and enhancing their TPACK. Connections with the knowledge-of-practice (Cochran-Smith & Lytle, 1999) construct suggests calling TPACK as TPACK-of-practice to more accurately describe the process of the knowledge development efforts for guiding inservice and preservice teachers in gaining, developing, and transforming their knowledge for teaching as new and more powerful technologies emerge for integration in education.

There can be infinite uses of the computer and of new age technology but if the teachers themselves are not able to bring it into the classroom and make it work, then it fails.

~Nancy Kassenbaum, U. S. Senator

INTRODUCTION

The digital age of the 21ˢᵗ century is revolutionizing education with increased teacher and student access to information in newer and faster ways as well as with increased emphasis on social interactions where collaboration and communication are important features of the learning experiences. But, as Senator Nancy Kassenbaum (http://www.azquotes.com/author/24822-Nancy_Kassebaum) declares, it is the teachers who must bring digital technologies "into the classroom and make it work." Today's teachers are faced with increasing expectations that they must respond to the influence of multiple digital technologies (hereafter referred to as technologies), not only integrating them in their instruction but examining the impact of these capabilities on the curriculum and the instructional pedagogies they enact in this new age. Typically, these newer technologies are ones with which teachers are unfamiliar, did not use in learning in their own precollege education, or have received little, if any, instruction in their teacher preparation programs on integrating technologies in teaching and learning. In essence, today's technologies require teachers and teacher candidates to think outside their traditional views of how the content is learned, communicated, and taught.

According to the Speak Up (Project Tomorrow, 2016), "When asked what was holding back further expansion of their digital learning visions, 57% of principals say the lack of teacher training on how to integrate digital content within instruction is their top barrier. Yet, reforming teachers' knowledge for teaching with multiple technologies requires that they have educational experiences to reframe their current knowledge and understandings, experiences that challenge them to rethink, unlearn and relearn as they consider newer and more powerful digital technologies as educational tools. Shreiter and Ammon (1989) propose that attention to these challenges requires teachers to engage in a process of assimilation and accommodation to reconstruct their knowledge and understanding from their personal experiences and learning of the content. They need practical experiences in inquiring and reflecting in ways that confront their conceptions for integrating multiple technologies as teaching and learning tools (Loughran, 2002; Schön, 1983). As they interact with new technologies and consider the usefulness of the technologies for teaching and learning, they must examine and challenge the nature of the subject matter, the nature of the curriculum and instruction, and how students think and learn with the technologies (Niess, 2005).

What is this knowledge that teachers rely on for effectively integrating technologies in instruction? Multiple teacher education scholars and researchers have participated in the identification, description, and examination of a new vision of teacher knowledge for teaching their subject matter content with technologies, now described as Technological Pedagogical Content Knowledge and otherwise referred to as TPACK (pronounced "tee-pack"), representing a Total "PACKage for integrating technological, pedagogical and content knowledge (Niess, 2008; Thompson & Mishra, 2007). The focus of this chapter is to describe and clarify this theoretical knowledge construct, illuminating teachers' strategic thinking for knowing when, where and how to integrate content-specific knowledge and pedagogical strategies for guiding students' learning with today's technologies. While the emphasis in this book is focused on inservice teachers, this chapter considers TPACK development for all teachers, both inservice and preserves teacher preparation.

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