Chapter 19
Online Instructional Strategies for Enhancing Teachers' TPACK:
Experiences, Discourse, and Critical Reflection

Margaret L. Niess
https://orcid.org/0000-0002-1673-0978
Oregon State University, USA

Henry Gillow-Wiles
Southern Oregon University, USA

ABSTRACT

This chapter provides a rich description of how scaffolding discourse and critical reflection with K-12 in-service teachers' online learning experiences enhanced their technological pedagogical content knowledge (TPACK) for teaching with technologies. The experiences modeled learning through inquiry tasks that merged content, technology, and pedagogy as envisioned in TPACK. The participants connected with the experiences as students learning about and with digital image and video technologies. Reflections on the experiences as teachers combined with the discourse interactions among the communities to influence their resulting individual critical reflections. A major theme was the recognition of the importance of shared knowledge as expanding individual knowledge. Four TPACK components revealed that the collection of the experiences, discourse, and critical reflection enhanced the participants' TPACK leading to recommendations for the design of online in-service teacher learning experiences for enhancing teachers' TPACK.

INTRODUCTION

The twenty-first century ushered in the explosion of digital technologies significantly changing how people interact, communicate and collaborate. With affordable digital applications, school-aged students have gained access to technologies for use as classroom learning tools. The International Society for Technology in Education (ISTE, 2016) Student Standards describes students learning using digital technologies to construct knowledge, identifying and solving problems, engaging in computational thinking, and communicating creatively while collaborating and working in teams. Essentially, they learn in an environment where they "think and process information fundamentally differently from their predecessors" (Prensky, 2001). They learn by actively doing rather than watching, taking advantage of the capabilities of new and more accessible digital technologies.

These new digital technologies require that in-service teachers be prepared to implement pedagogical strategies in vastly different ways than the predominantly teacher-directed pedagogies of the twentieth century. They must identify, orchestrate and manage activities to guide students in working in teams, using technologies as integral learning tools in the activities. These instructional tasks call for teachers who have knowledge that dynamically integrates the content, pedagogy and technologies (Koehler & Mishra, 2006). This ability describes this knowledge as Technological Pedagogical Content Knowledge (Angeli & Valanides, 2005, 2009; Mishra & Koehler, 2006; Niess, 2005), or TPACK (Thompson & Mishra, 2007). Clarifying this teacher knowledge, Niess (2005) highlights four components of TPACK as an integration of teachers':

1. Overarching conceptions about the purposes for incorporating technology in teaching subject matter topics;
2. Knowledge of students' understandings, thinking and learning in subject matter topics with technology;
3. Knowledge of instructional strategies and representations for teaching and learning subject matter topics with technologies;
4. Knowledge of curriculum and curricular materials that integrate technology in learning and teaching subject matter topics. (Niess, Ronau, Shafer, Driskell, Harper, Johnston, Browning, Özgün-Koca, & Kersaint, 2009, p. 8)

A dynamic equilibrium among content, pedagogy and technology knowledge develops through teachers' strategic thinking of when, where, and how to guide students' learning of the content with the technologies. The process requires far more than simply adding knowledge of a technology to the mix of the content and the pedagogy. Here, teachers' thoughts and efforts for integrating technological knowledge with content knowledge and pedagogical knowledge unifies the ideas into a new element, such that it no longer separates or differentiates among the different knowledge bases of content, technology and pedagogy. TPACK proposes a complex interaction as:

a unique and distinct body of knowledge that goes beyond simple integration, or accumulation, of the constituent knowledge bases, toward transformation of these contributing knowledge bases into something new and unique. (Angeli, Valanides, & Christodoulou, 2016, p. 21)

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/online-instructional-strategies-for-enhancing-teachers-tpack/271160

Related Content

Online Learning Support in a Ubiquitous Learning Environment
Ramashego Shila Mphahlele (2023). *Research Anthology on Remote Teaching and Learning and the Future of Online Education (pp. 1265-1281).*
www.irma-international.org/chapter/online-learning-support-in-a-ubiquitous-learning-environment/312780

Embodied Conceptualizations: Social Tagging and E-Learning
M. Reicheland A. Kohlhase (2008). *International Journal of Web-Based Learning and Teaching Technologies (pp. 58-67).*
www.irma-international.org/article/embodied-conceptualizations-social-tagging-learning/3000

Knowledge Representation in Intelligent Educational Systems
Ioannis Hatzilygeroudisand Jim Prentzas (2006). *Web-Based Intelligent E-Learning Systems: Technologies and Applications (pp. 175-192).*
www.irma-international.org/chapter/knowledge-representation-intelligent-educational-systems/31366

Increasing Access to Effective Education Across Oceania
Robert Hoganand Natalie Nimmer (2013). *International Journal of Web-Based Learning and Teaching Technologies (pp. 17-31).*
www.irma-international.org/article/increasing-access-to-effective-education-across-oceania/86252

Effects of Anonymity and Accountability During Online Peer Assessment
Gunita Wadhwa, Henry Schulzand Bruce L. Mann (2006). *Selected Styles in Web-Based Educational Research (pp. 302-333).*
www.irma-international.org/chapter/effects-anonymity-accountability-during-online/28786