

Chapter 37

Online Learning Trajectory for Knowledge–Building Communities to Reframe Inservice Teachers' TPACK

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ABSTRACT

Knowledge-building communities facilitate learning through collaborative explorations and investigations using today's technologies as learning tools. Such communities support teachers in developing their Technological Pedagogical Content Knowledge (or TPACK) so they are able to rearrange educational experiences using a systems pedagogical approach for engaging students in communication, collaboration and inquiry-oriented technologies. A current educational setting for reframing inservice teachers' knowledge involves online instruction. A researcher conjectured, empirically supported online TPACK learning trajectory provides guidelines for teacher educators as they design new online coursework for guiding teachers in enhancing their TPACK. Using a design-based research methodology, a social metacognitive constructivist instructional lens frames this online learning trajectory for organizing the course content development by interweaving descriptive tasks with specific pedagogical strategies towards reframing inservice teachers' knowledge through knowledge-building communities. The resulting trajectory describes a dynamic interaction of key tools and instructional processes for scaffolding the content towards an enhanced TPACK understanding.

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Online learning is not the next big thing, it is the now big thing.

~ Donna J. Abernathy, 1999

INTRODUCTION

The explosion of digital technologies in this new century has provided access to multiple robust inquiry, communication, and collaboration applications. The enhanced capabilities provide educational opportunities with digital technologies (hereafter referred to as technologies) for engaging students in deeper and more thoughtful learning. The idea of “knowledge building communities” (Scardamalia & Bereiter, 2006; Zhang, J., Scardamalia, Reeve, & Messina, 2009) projects a global society where individuals are able to access knowledge that is far richer and in more depth than that available in the previous century. In knowledge-building communities that take advantage of today’s technologies, “students think and process information fundamentally differently from their predecessors” (Prensky, 2001). They learn by actively doing rather than watching. They are comfortable using multiple technologies to gather information quickly, they function best when networked, they multi-task and like teamwork for solving tasks collaboratively. In essence, knowledge-building communities that incorporate 21st century technologies facilitate students in learning content and thinking skills through more and more collaborative and interactive explorations and investigations.

The implementation of knowledge-building communities, however, requires new pedagogical strategies that are vastly different from the predominant teacher-directed pedagogies of the 20th century, where teachers impart knowledge and students practice and confirm their understanding through worksheets and other activities. Today’s teachers now must identify, orchestrate and manage activities in their content areas in ways that successfully support students through activities such as engagement in knowledge-building communities. The task calls for a teacher knowledge that demands far more than just an understanding of the subject matter content. It ultimately necessitates a robust pedagogical knowledge along with knowledge for teaching with the vast array of technological innovations. In essence this task calls for Technological Pedagogical Content Knowledge (Angeli & Valanides, 2005; Mishra & Koehler, 2006; Niess, 2005), or TPACK (Niess, 2008; Thompson & Mishra, 2007), the complex interaction among content knowledge, pedagogical knowledge and technological knowledge leading to strategic thinking of when, where, and how to guide students’ learning with technologies.

While the TPACK construct is recognized and supported by extensive research and scholarly work, teacher educators are faced with identifying professional inservice learning experiences that are effective in transforming teachers’ knowledge into this robust pedagogical understanding so that they understand and are able to establish knowledge-building communities where their students collaborate and communicate as they engage in inquiry tasks using today’s technologies. Through these professional experiences, teachers are engaged in relearning, rethinking, and redefining teaching and learning as they know and learned it. Basically, they must confront their current conceptions for integrating technologies as learning tools in their content areas (Loughran, 2002) in order to develop the reformed TPACK understandings, understandings that are more apt to result in high interactivity among the students as they engage multiple technologies for communication, collaboration and inquiry.

An important educational setting for teachers’ professional learning experiences now uses online instruction to provide improved access for teachers while they are teaching. As Abernathy (past editor

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