Chapter 24
Engaging Google Docs to Support Collaboration and Reflection in Online Teacher Education

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ABSTRACT

The purpose of this chapter is to describe the impact engaging collaborative software has on technological pedagogical content knowledge (TPACK) development through collaboration and reflection. Situating teaching and learning in an online teacher education environment creates challenges for developing learning communities supporting reflection and collaboration. This cross case analysis reveals the impact of Google Docs to facilitate reflection and collaboration in an online integrated mathematics, science, and technology education graduate program has on developing in-service teachers' TPACK. Using a social metacognitive constructivist lens to focus the course design, this study collected student learning products, including essays, Blackboard forum transcripts, and Google Docs editing histories to understand how participants' TPACK thinking matured through their collaboration and reflections. Results suggest Google Docs provided a rich online environment where participants were able to engage in and reflect on a community that developed both individual and shared knowledge.

INTRODUCTION

Teachers today are immersed in an environment where digital technologies are everywhere, as part of what they teach, how they teach, and where they teach. Today's digital technologies have expanded communication and social media capabilities that have educational use potential. Yet, most teachers have been prepared for teaching prior to these new and emerging technologies. They have not learned their content with these newer technologies. They need to learn how to

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learn with the new technologies. Knowing how to learn with technology becomes even more critical when continuing education courses are taught in an online environment (a less familiar learning environment for most teachers) and structured by a social metacognitive constructivist learning trajectory (Dabbagh & Kitsantas, 2012; Sztajn, Confrey, Wilson, & Edgington, 2012).

Unfortunately, for the most part, teachers have had little preparation that develops the knowledge for teaching in this technology- rich professional world that integrates technology into their teaching as described by the technological pedagogical content knowledge (TPACK) framework (Mishra & Koehler, 2006; Niess, 2005). In the TPACK conceptualization, the role of technological knowledge goes beyond providing a way to get students engaged in the learning to actively using the technology as a learning tool for inquiry, sharing, and collaboration. To develop this understanding of how technology can be a learning tool, teachers must have experiences in their own learning, where they use the technology to learn the content (Fanning, 1994). These learning experiences play an important part of transforming teachers' knowledge for teaching, where their thinking about technology is fundamentally restructured (Niess & Gillow-Wiles, 2013).

Such challenges of introducing technology integration as an immersive experience are not the only issues with which today's teacher educators are grappling. The conception of the teacher as the repository of knowledge and teaching as the delivery of knowledge is recognized as misaligned with how people actually learn (Steenbeek & Geert, 2013). To understand this disconnect and to develop more effective teaching and learning theory, a growing body of educational research supports a social metacognitive constructivist framework when designing curriculum (Chu & Kennedy, 2011; Ioannou, Demetriou, & Mama, 2014; Niess & Gillow-Wiles, 2009). This framework promotes both individual and social reflection, where students and teachers interact to co-create knowledge and understanding. From this learner- centered perspective, creating a dynamic interplay between individual learning and collaborative learning becomes a foundational aspect of designing an effective learning experience as a community of learners (Shea & Bidjerano, 2010).

Finally, the penetration of the Internet into the world of education creates an imperative for understanding how this virtual space offers a new environment for teaching and learning (Barbour, 2009; Correia & Davis, 2008). Although the Internet provides access to many who would otherwise be unable to avail themselves of educational opportunities, the sparseness of recognized effective instructional strategies that support learning in this environment requires educators to rethink commonly held understandings and beliefs concerning teaching and learning (Stevenson & Hedberg, 2013). The strengths and affordances, as well as the weaknesses and constraints of the online world need to be explored and understood if distance learning is to meet the expectations the education community has for it.

Intersecting digital technologies, socially constructed learning, and distance education brings new challenges to the design of teacher education programs. While each of these aspects of education brings important advances to teaching and learning, the dynamic interplay between them results in a new teacher knowledge that transforms the prior teacher knowledge to a new knowledge that is of a higher order (Niess & Gillow-Wiles, 2013; Niess, van Zee, & Gillow-Wiles, 2011). This transformative intersection of technology integration, community of inquiry learning, and an online environment for teacher education is the focus of this chapter.

Using the idea of an integrated online curriculum, where technology supports community centered learning, the faculty developed a sequence of online graduate level course. The graduate courses at the focus of this study were embedded in an online Master of Science (MS) degree program where technology is woven throughout