When using technology isn't enough: A comparison of high school civics teachers' TPCK in one-to-one laptop environments

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ABSTRACT

In this multiple case study, the authors compare the instruction of two high school civics teachers during the 2012 Presidential Election. Both were highly-qualified practitioners who worked in schools with one-to-one laptop initiatives, creating an environment in which access to digital technology ceased to be an issue. Although both teachers regularly used technology in their classrooms, the authors describe stark differences in the complexity and authenticity of their instruction, which the authors attribute to the teachers' technological pedagogical content knowledge (TPCK). The authors conclude by discussing implications for better understanding TPCK within civics instruction, specifically in classrooms with one-to-one laptop access.

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Introduction

Research has found that successful technology integration in K-12 classrooms is influenced by multiple factors. Impediments such as insufficient time, access, and support, which are often termed first-order barriers, tend to quickly deter teachers from using technology in their instruction (e.g., Cuban, 2001; Ertmer, Addison, Lane, Ross, & Woods, 1999; Grimes & Warschauer, 2008). When these barriers cease to exist, however, second-order barriers, which are intrinsic to the teacher, can also influence teachers' technology integration. Second-order barriers include preexisting knowledge and beliefs about integrating technology into classroom practices, and research suggests that these impediments are often more difficult to change than first-order barriers (Ertmer et al., 1999).

Now that access to technology is closer to becoming ubiquitous in American public education, the focus on technology integration within social studies education needs to shift to better understanding how teachers respond to these second-order barriers (Swan & Hofer, 2008). In this study, we compare the classroom instruction of two high school civics teachers in an attempt to illustrate the importance of technological pedagogical content knowledge (TPCK) in transforming social studies instruction via digital technologies. Both teachers worked in settings where most first-order barriers were non-existent; students in both classes had one-to-one access to laptops that they could take home, both classrooms had high-speed wireless Internet connections, both teachers were given access to technical support, and both teachers worked with administrators who were supportive of technology integration. Yet, despite these similar contexts, we observed stark differences in how each teacher used technology to support his civics instruction.

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Review of related literature

Technological pedagogical content knowledge

One factor influencing technology integration for all teachers is teacher knowledge, which takes a variety of forms. One aspect of teacher knowledge that is essential to successful implementation of technology in classrooms is technological knowledge. Since the technology available to teachers is always changing, teachers' technological knowledge must also constantly change (Ertmer & Ottenbreit-Leftwich, 2010; Harris, Mishra, & Koehler, 2009). It is common for teachers to be intimidated by the use of technology in the classroom due to a lack of confidence in either their technological knowledge or their ability to integrate technology effectively into their curriculum. Teachers who feel confident in their ability to integrate technology into their classroom instruction, however, tend to spend more time using it in the classroom, which, in turn, helps them develop their knowledge of how different technologies work and improves their trouble-shooting capabilities (Ertmer & Ottenbreit-Leftwich, 2010; Moore-Hayes, 2011).

A secondary factor influencing teachers' technology use is their pedagogical content knowledge (PCK), which Shulman (1987) argues is a unique body of knowledge that blends content and pedagogy. Simply being well-versed in content is not sufficient for quality instruction; teachers also need to be skilled in how to deliver content in ways that students can understand it and apply it to their existing knowledge base. Part of PCK is being able to use a variety of pedagogical tools, including available technologies, to further students' understanding of content; therefore, a blending of technological knowledge and PCK is essential for success in 21st century classrooms.

Mishra and Koehler (2006) represent this merging of knowledge bases through the TPCK framework. This framework suggests that in order for teachers to effectively integrate technology they need to have knowledge of the relationship between the content they are teaching, best practices for teaching that content, and the technology they are using (Ertmer & Ottenbreit-Leftwich, 2010; Mishra & Koehler, 2006). A visual representation of the TPCK framework is seen in Fig. 1. When teachers are thinking within the TPCK framework, they are simultaneously considering what they know about technology, pedagogy, and content as they are making decisions about instruction.

As such, the application of TPCK varies depending on the situation, including the content being taught and the resources available (Harris & Hofer, 2011). As Mishra and Koehler (2006) state,

> There is no single technological solution that applies for every teacher, every course, or every view of teaching. Quality teaching requires developing a nuanced understanding of the complex relationships [among] technology, content, and pedagogy, and using this understanding to develop appropriate, context–specific strategies and representations. (p. 1029)

Because knowledge of pedagogy and content plays a significant role in the way teachers integrate technology in their instruction, it is important to examine how technology is being used in various content areas and whether pedagogical differences in those content areas affects the use of technology (Harris & Hofer, 2011). Hofer and Harris (2011), for example,
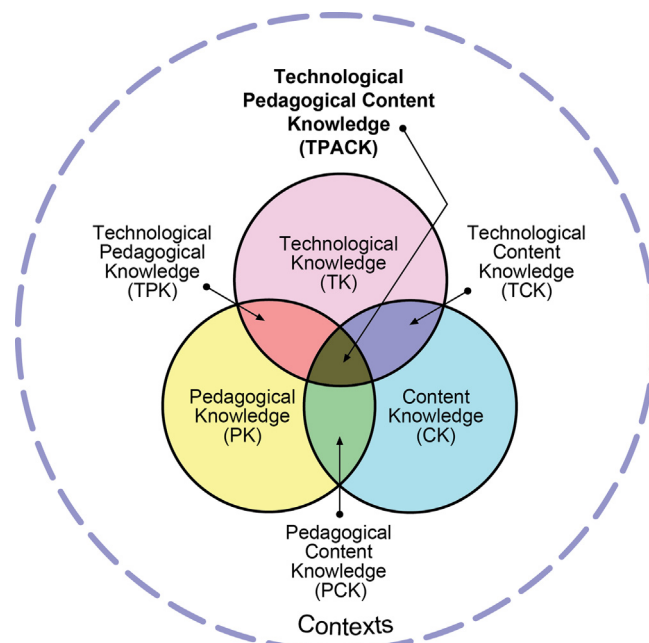
Fig. 1. Technological Pedagogical Content Knowledge (TPCK). *Note:* Image reproduced with permission of the publisher and can be found at http://tpack.org.