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.

Keywords: Technological pedagogical content knowledge | One-to-one initiatives | Laptops | Civics | Presidential elections

Article:

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 et al., 1999 and Grimes and 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.

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 and Ottenbreit-Leftwich, 2010 and Harris et al., 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 and Ottenbreit-Leftwich, 2010 and 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 and Ottenbreit-Leftwich, 2010 and Mishra and 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.
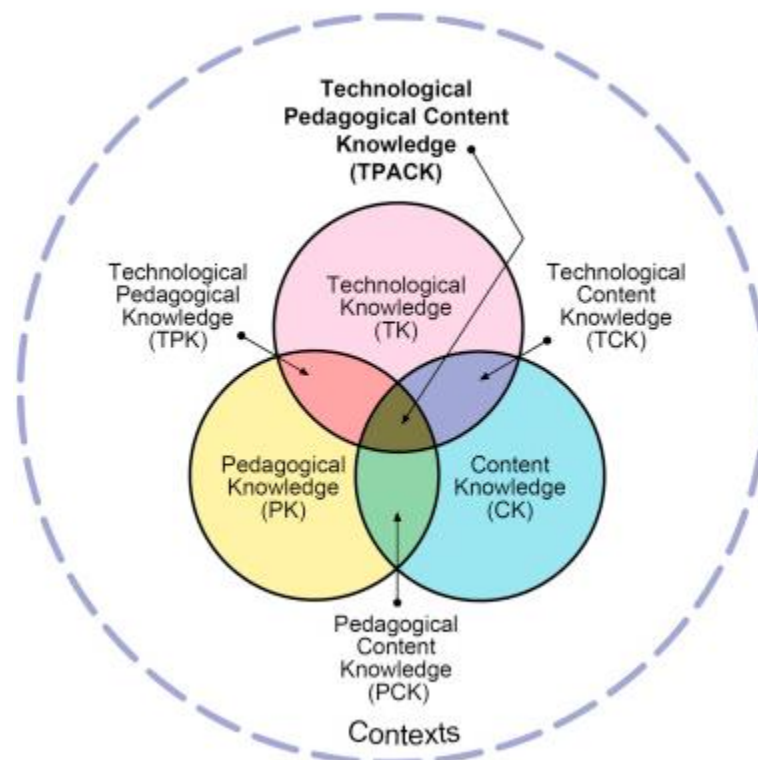

Fig. 1. Technological Pedagogical Content Knowledge (TPCK). Note: Image reproduced with permission of the publisher and can be found at http://tpack.org.

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, have identified various activity types that describe how teachers use technology within their specific content areas. To date, they have identified 44 social studies activity types that range from helping students build their knowledge of content to providing opportunities for students to relay what they are learning in multiple ways.

Within the research base, however, TPCK in social studies has been examined primarily through two main approaches, either as a framework for understanding the influence of teacher knowledge on teachers′ use of technology within a specific content area (e.g., Debele and Plevyak, 2012, Hofer and Swan, 2008, Swan and Hofer, 2011 and Wright and Wilson, 2009) or as the foundation for effective use of technology shared with teachers through professional development (e.g., Harris et al., 2009 and Harris and Hofer, 2011). Although social studies teachers are often content experts, many struggle with understanding how technology would best fit within their content instruction. Research suggests that social studies teachers too often only use universal technology tools, such as word processing and presentation aids, instead of content-specific tools, such as digital archives of historical documents and online simulations (e.g., Swan & Hofer, 2011). Other research also suggests that social studies teachers often use technology as a tool for managing their classrooms rather than for critically enhancing content instruction (e.g., Wright & Wilson, 2009).

Swan and Hofer (2011), for example, studied teachers′ use of podcasts as a tool for economics instruction. They found that although the teachers successfully integrated podcasting projects into their instruction, they failed to articulate any significant connections between podcasting and economics or how the integration of podcasting could contribute to the students′ understanding of content. Collectively, the research base suggests that pedagogical and content area expertise do not seamlessly fit with learned technological knowledge and that more focus needs to be placed on support for developing social studies teachers′ TPCK in specific content areas. Research, for example, on teachers′ TPCK within civics instruction, which is the focus of the present study, is limited and in need of further examination.

Technology and civics instruction

There exists an extensive literature base documenting the use of technology in social studies instruction, and it is generally agreed upon that, when used correctly, technology has the potential to increase student interest and motivation for learning (e.g., Berson, 1996 and Heafner, 2004). The majority of published research in this area, however, focuses on history and geography instruction (Swan & Hofer, 2008). Although critical uses of technology in history or geography may carry civic implications (e.g., Manfra, 2008 and Milson and Alibrandi, 2008), the present study focuses on technology as a tool for helping students understand the curriculum found in a typical high school civics or government course.

A high-quality civics or government course will cover the structure and role of federal, state, and local governments; discuss the rights and responsibilities of citizenship; provide opportunities for

students to deliberate politics and current political issues; and encourage student civic activism (Journell, 2010 and Kahne and Middaugh, 2008). As such, Kahne, Chi, and Middaugh (2006) describe civics and government courses as "the part of the formal high school curriculum that is most explicitly linked to the democratic purposes of education" (p. 391). Perhaps not surprisingly, then, much has been written about the *potential* of technology to enhance civic instruction. Both social studies educators and political scientists, for example, have argued that the Internet has the potential to serve as a conduit for civic action by bridging the gap between classrooms and American political life (e.g., Bennett, 2008, Crowe, 2006, Friedman, 2006, Hicks et al., 2002, Kahne et al., 2012, O'Brien, 2008, VanFossen and Berson, 2008 and Waring, 2006). Others have offered theoretical arguments encouraging teachers to use digital technologies as a way to follow current events or foster authentic understandings of political processes (e.g., Journell, 2009a, Journell, 2009b and O'Brien et al., 2006).

Only recently, however, have scholars begun to analyze how teachers are actually using digital technologies to teach civics content and monitor current events. Journell (2011a), for example, observed that teachers relied on YouTube videos, online political quizzes, and digital electoral maps when teaching the 2008 Presidential Election, and more recently, Journell, Ayers, and Beeson (2013) chronicled how students used Twitter to follow major events during the 2012 Presidential Election. Another recent study by Blevins, LeCompte, and Wells (2014) analyzed students′ responses to the iCivics curriculum and found that the games seemed to increase students′ knowledge of civics content but did little to encourage them to follow current events or discuss current political issues.

In each of these studies, however, the effectiveness of the technology was seemingly linked to the teachers′ TPCK. In each case, the authors concluded that the technology in question held considerable potential for civic education but that the teacher's role was crucial in determining the quality of instruction students received. These studies highlight the need for a more nuanced understanding of social studies teachers′ TPCK, especially with respect to civics instruction. The present study seeks to build upon this growing literature base by comparing the instruction of two high school civics teachers, one who demonstrated strong TPCK and one whose technology use did little to advance his students′ knowledge of content.

METHODOLOGY

Settings and participants

This research uses a "models of wisdom" approach (Wineburg & Wilson, 1988) and is part of a larger study that focused on how exemplary civics teachers taught politics during the 2012 Presidential Election. The two teachers who took part in the study, Mr. Fillmore and Mr. Monroe,[2] were purposefully chosen due to their reputations as exceptional teachers, which were based on a variety of factors, including their penchant for using technology on a regular basis as part of their classroom instruction. Both teachers were nominated for participation in the study by district social studies personnel and their school principals, had recently received awards for their teaching prowess, and regularly boasted high student pass rates on state-mandated exams.

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[2] All names and identifying information have been changed to help protect participants′ identities.

Mr. Fillmore, who was White and in his 18th year of teaching, held National Board certification, had earned a master′s degree in history and secondary education, and had recently received a prestigious award for exemplary teaching. He taught at Connor High School (CHS), a Title I school of approximately 1000 students located in a rural area of North Carolina. At the time of the study, the CHS student population was approximately 73% White, 15% African-American, 8% Latino/a, and 3% multiracial, with approximately 52% of students eligible for free or reduced-price lunch. For data collection, we focused specifically on Mr. Fillmore′s general-level civics class. The 27 students in that class (15 female, 12 male) were predominately sophomores, and 14 self-identified as White, four as Latino/a, two as African-American, one as African-American/Italian, and one as Native American/White.[3]

Mr. Monroe was recruited to participate in this study after being identified as an exceptional teacher by the second author, who had observed Mr. Monroe during the Fall 2010 semester as part of an unrelated study on the use of film in civics classrooms (Journell and Buchanan, 2013). Mr. Monroe, who was White and in his fifth year of teaching at the time of the present study, was a recent recipient of a statewide award for exemplary social studies instruction. He taught at Madison High School (MHS), which was located in a small North Carolina town and enrolled approximately 1000 students at the time of the study. The MHS student body was approximately 71% White, 17% African-American, 9% Latino/a, and 2% identifying as either Asian or biracial, with approximately 28% of students eligible for free or reduced-price lunch.

We observed Mr. Monroe′s honors-level civics class, which contained 26 students (15 male, 11 female) who were predominately sophomores. Sixteen students self-identified as White, seven as African-American, and two as Latino/a. One student identified as "other" but did not offer a more detailed explanation.

Both schools provided their teachers and students with ubiquitous access to technology. MHS was in their fourth year of a one-to-one laptop initiative for all high school students within the district. CHS began a similar initiative during the Fall 2012 semester, although Mr. Fillmore was one of a handful of district teachers chosen to pilot the one-to-one laptop program the year before. Both schools offered high-speed, wireless Internet connections and provided teachers institutional technical support.[4]

Data collection and analysis

This research used a multiple case study approach in which Mr. Fillmore and Mr. Monroe′s classes served as two "bounded systems" for our data collection (Stake, 1995). Case study

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[3] We obtained student demographic data from surveys given at the beginning of the study. In Mr. Fillmore′s class, one student was chronically absent and never completed the survey, another student never returned the parental permission slip required by the Internal Review Board, and three other students declined to participate in the survey. We, therefore, do not have demographic information about those students.

[4] The instructional technical support included learning management systems (MHS used Moodle, and CHS used Canvas) and instructional technology personnel who responded to technological concerns. Although this technical support may not meet what is deemed necessary at schools noted for having high-functioning technology programs (Levin & Schrum, 2012), neither Mr. Monroe nor Mr. Fillmore expressed displeasure at the technical support offered to them. It is important to note, however, that these supports were only designed to help facilitate instruction from a technological standpoint, not from a TPCK standpoint.

methodology is useful for "examining contemporary events, but when relevant behaviors cannot be manipulated" (Yin, 1994, p. 8), and given that our research goal was to better understand how exemplary teachers framed their civics instruction during a high-profile political event, this approach seemed appropriate. Our primary method of data collection was regular observations of both classes in which we served as participant-observers (Merriam, 1998). From the beginning of the school year in August through mid-November, a member of the research team observed each teacher approximately three times per week, and our observations were planned around each teacher's schedule to ensure that we would be observing on days in which students were engaged in content instruction. In total, we observed Mr. Fillmore 36 times and Mr. Monroe 30 times over the course of the semester.

The primary purpose of the classroom observations was to document how each teacher chose to deliver his political instruction over the course of the semester, and given that both teachers utilized technology on a regular basis, a secondary purpose was to better understand how each teacher made use of the one-to-one laptop environment in delivering that content. During each observation, the member of the research team kept detailed field notes using a protocol that allowed for the delineation of observed events and the researcher's interpretations of those events. Due to Internal Review Board restrictions and district policies, we were unable to audiorecord classroom conversations; however, each researcher attempted to record as many verbatim quotations as possible and clearly indicated exact quotations from other syntheses of classroom dialog within his or her field notes. To increase the validity of our interpretations, we informally discussed our observations with Mr. Fillmore and Mr. Monroe on a regular basis, and the research team met periodically throughout the study, which helped confirm or dispel our existing perceptions and better inform future observations (Glaser and Strauss, 1967 and Maxwell, 2005).

In addition to classroom observations, we collected relevant classroom artifacts and formally interviewed both teachers as a way to triangulate our data (Hammersley & Atkinson, 1995). Both Mr. Fillmore and Mr. Monroe were interviewed twice, once at the beginning of the study and again after the conclusion of the election. The initial interview served to collect demographic data and better understand each teacher's teaching philosophy and plans for the semester. The final interview asked each teacher to reflect upon his instruction over the course of the semester. Both interviews were semi-structured in nature (Merriam, 1998) and focused purposefully on content, given that the larger goal of the study was to determine best practices for teaching politics during a high-profile political event. Since both teachers relied heavily on technology as part of their instruction, however, many of their answers to the content-related questions invoked their use of technology. All interviews were audiorecorded and transcribed for accuracy, and a general protocol can be found in Appendix A.

All data were then analyzed using the procedures for case study analysis outlined by Stake (1995). We identified areas of interest within the data, which involved manually going through each observation write-up and any classroom artifacts and identifying instances in which the teachers used technology as a tool for their political instruction. We also went through each of the four interview transcripts and identified instances in which the teachers discussed their beliefs about content instruction, teaching philosophies, and use of technology.

We then used the TPCK framework to identify relevant themes. We used the activity types for social studies outlined by Harris and Hofer (2011) as a starting point but also developed additional themes based specifically on the political instruction observed in each class. Once themes were established, we then looked for patterns within data in order to establish meaning about each of the cases. We then used existing research and theory, specifically the TPCK framework, to create a narrative of the data (Glaser and Strauss, 1967 and Stake, 1995). Although our findings are not generalizable beyond the two cases described above, the larger themes presented in the findings could be transferred to similar contexts (Lincoln & Guba, 1985).

Findings

Over the course of the semester, Mr. Fillmore and Mr. Monroe used technology in strikingly different ways, despite having similar access to technology and a shared goal of teaching students about politics and the presidential election. Although the intended goal of this study was not to compare the teaching ability of Mr. Fillmore and Mr. Monroe, the contrast between the two teachers′ use of technology during coverage of the election provided a unique opportunity to better understand TPCK in civics classrooms. Following narrative descriptions of the technological instruction that occurred in each classroom, we discuss implications for research and practice.

Mr. Fillmore′s class[5]

From a content standpoint, Mr. Fillmore expressed a general desire for his students to actively follow the presidential election and develop their own political beliefs over the course of the semester. As he stated to us in our initial interview,

> I think it′s, you know, very good for the kids to debate and the main thing is just to be, like you said, informed about the issues. You know, so many times, they just don′t have a clue what the issue actually holds. And so, it′s good for them to talk about it and hear different points of view.

Mr. Fillmore also viewed technology as integral to helping his students achieve his instructional goals. When asked about his teaching philosophy, Mr. Fillmore quickly turned the conversation to the abundant technology provided by his school district:

> I like to do a lot of variety of activities. You know, we′ve been fortunate in [his school district] that we′ve had a lot of technology, you know, in the last few years. Starting with laptops, then interactive whiteboards and now, all the kids are going [one-to-one], so all the kids will have their [laptop] this year. So that will be really good.

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[5] In this article, we are only focusing on Mr. Fillmore′s classroom instruction. At the onset of the semester, Mr. Fillmore had envisioned using Twitter as a tool to follow the presidential election. However, Twitter and all forms of social media were soon blocked by the district due to students abusing them during class. Mr. Fillmore was then forced to mandate that all Twitter-related assignments be done at home for extra credit, and we are not using those assignments as part of our analysis. For more information about the Twitter project, refer to Journell et al., 2013.

He continued by saying, "I'm really going to do my best to go, not completely paperless, but, you know, we're going to do most things through [the laptops]."

Yet, Mr. Fillmore recognized that the introduction of the one-to-one laptop initiative would most likely create issues that would affect his instruction. Although he had piloted the one-to-one initiative the year before, he anticipated that having the students in charge of the laptops instead of them remaining secure in his classrooms would lead to procedural and classroom management concerns. As he stated,

> [The students last year] didn't have [the laptops] full time. We kept them here and had a cart box and we charged them so we kept them here… This semester, every kid has been issued one. So, they'll take them home and so, the issues of, you know, whether or not they got charged last night and, you know, some students may not have internet access, so that's something at home that I'll have to, you know, accommodate to.

He quickly added, though, "But, overall, I think it's going to be a really good transition, and I think the kids are really going to, you know, like it."

True to his word, Mr. Fillmore used the laptops almost every day; students had their laptops out for at least part of the lesson in all but one of our 36 observations. Mr. Fillmore seemed comfortable using the laptops and never appeared flustered by technical issues. Yet, he was also noticeably negligent in terms of managing student use of the laptops as students were often observed navigating between assigned material and non-academic websites, such as YouTube or Facebook, during lessons.

The level at which Mr. Fillmore's technology use engaged students and enhanced curricular content also varied. The most common use of the laptops was to access the school's learning management system, which Mr. Fillmore used to post quizzes, website links, Google Documents, and other items he wanted students to view, such as daily political cartoons. This information was mostly used as a method of reviewing content before a quiz, either through a teacher-created review on a Google Document or student-created flashcards in Google Presentations. Occasionally, Mr. Fillmore would also use BrainPop (http://www.brainpop.com/) quizzes as a way to review content.

Mr. Fillmore's use of Web 2.0 tools was more interactive, but he rarely used them to achieve the pedagogical goals that he articulated at the beginning of the semester. Websites like TodaysMeet (http://www.todaysmeet.com), a free online discussion board that does not require a username or password, were used for "discussions" in which Mr. Fillmore would pose a question that students would answer by typing and sharing their thoughts.[6] Frequently, these question and answer sessions were knowledge-level questions that tested students' ability to recall a lecture or textbook reading. We often observed students turning to Google to quickly find an answer to Mr. Fillmore's questions rather than discussing the posed question as he had intended. Even in the

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[6] We are using the term "discussion" because that was the term used by Mr. Fillmore. We acknowledge, however, that these student interactions were not discussions as commonly defined within the field (e.g., Parker, 2006). Rather, they tended to be recitations of content, which research has found to be what many social studies teachers consider to be classroom discussions (Wilen, 2004).

rare cases that these interactive discussions highlighted the election or other current political issues, the recall nature of the questions Mr. Fillmore posed often prohibited student interaction and sustained engagement with the topic.

Perhaps the most noticeable mismatch of technology and content came during an activity in which Mr. Fillmore had students use a free video-making tool called GoAnimate (http://www.goanimate.com) to explore the branches of state government. Because it was an election year, GoAnimate offered movie scenes aligned with the election, such as a debate hall or a newsroom, and the characters strongly resembled President Obama, Governor Romney, and other important figures in the presidential election. Although this tool could have provided a powerful platform for simulations of political discourse, Mr. Fillmore chose to have students complete a teacher-prepared Google Document on the powers of the various branches, using the characters in GoAnimate to verbalize answers to the questions. Not only were characters resembling Obama and Romney ill-suited for a lesson on state government, some students also used these same characters to describe powers of the state legislative branch, which illustrates an even greater lack of content understanding. In this case, the power of using GoAnimate was lost because the product lacked authenticity and did not reach a level of understanding beyond what is typically found on traditional worksheets.

Although we occasionally observed Mr. Fillmore demonstrating strong TPCK, most notably with a lesson on the thirteen original colonies in which he used Google Maps as a collaborative tool for students, the vast majority of his technology use seemed to fall short of his pedagogical goals of encouraging his students to think critically about content. Yet, when we interviewed him at the conclusion of the study, he made a point to mention his use of Web 2.0 tools as a highlight of his instruction over the course of the semester. From a TPCK standpoint, it did not appear as though Mr. Fillmore viewed his technology instruction as failing to meet his pedagogical goals; rather, he seemed content with the fact that his use of technology made his curriculum more esthetically stimulating than notetaking and completing traditional worksheets.

Mr. Monroe's class

Mr. Monroe also entered the semester planning to spend a considerable amount of time discussing the election, stating that he would "talk about the election every single day until it happens." In contrast to Mr. Fillmore, however, Mr. Monroe seemed to articulate more specific goals in terms of the election content he wanted to cover. In the course of our initial interview, he listed a variety of concepts (e.g., the party conventions, the debates, the Electoral College, Political Action Committee spending) that he planned to explore between the start of school and Election Day. He also articulated specific technological applications that he planned to use to achieve these goals. For example, he stated that "I'm going to have them make two campaign commercials, one from the campaign and then one super-PAC commercial" using iMovie, which he acknowledged that he had used in previous years.

As in our observations of Mr. Fillmore's class, we found Mr. Monroe's students using their laptops nearly every class period. Whereas Mr. Fillmore seemed to use technology as a way to drill and repeat the standard curriculum, Mr. Monroe used technology as a tool for exploration and creation. For example, a regular activity involved checking the status of the campaign using

polling data. Not only did Mr. Monroe use websites from various "liberal" and "conservative" polling organizations (e.g., Gallup, Rassmussen) to show variability from one organization to another, which is an element of civic literacy that many Americans do not possess (Wilson & Journell et al., 2011), he also had students make predictions based on the data they found.

After discussing the limitations of polling data, the website predominately used by Mr. Monroe to track the status of the election was the Real Clear Politics (RCP) electoral map (http://www.realclearpolitics.com/epolls/2012/president/2012_elections_electoral_college_map.html), which provided an average of polling data from a variety of organizations. In addition to synthesizing the information contained on the RCP website, he had students use that information to predict subsequent strategies of each campaign. On September 18th, for example, Mr. Monroe had his students find three different pathways for Romney, who was trailing in the Electoral College, to reach the magic number of 270. He then had them assume the role of a Romney campaign advisor and develop a strategy to win the election based on the likelihood of a given state to switch from Democrat to Republican based on the RCP polling average.

In that one assignment, Mr. Monroe achieved a depth of political understanding not often found in high school civics classrooms (Journell, 2011a, Journell, 2011b and Parker et al., 2011). However, he continued to increase the complexity of students' understanding of the electoral process by introducing concepts such as media markets, Political Action Committees, and campaign fundraising over the course of the semester. With each new concept, Mr. Monroe used available technology to scaffold this new information into students' existing understanding. Later in the semester, for example, Mr. Monroe had his students explore interactive websites from the *New York Times* (http://www.elections.nytimes.com/2012/campaign-finance), *Washington Post* (www.washingtonpost.com/wp-srv/special/politics/2012-presidential-campaign-visits), and *The National Journal* (www.nationaljournal.com/hotline/ad-spending-in-presidential-battleground-states-20120620) that documented the amount of money each candidate had raised, both from private contributions and Political Action Committees, and charted the amount of money and time being spent in each of the swing states over the course of the campaign. Mr. Monroe then asked his students to recreate the aforementioned exercise in which they assumed the role of campaign advisors and developed a strategy for each candidate to win the Electoral College. The resulting dialog displayed a more nuanced understanding of political campaigns and the decisions that political strategists have to make in light of limited resources.

In addition to understanding polling data and the Electoral College, technology was integral to Mr. Monroe's instruction on political propaganda. Following a presentation on various propaganda techniques in which Mr. Monroe used YouTube and The Living Room Candidate (http://www.livingroomcandidate.com) to provide examples of historical presidential advertisements, he had each group create an iMovie commercial for their respective candidate. As a way to make the activity as authentic as possible, Mr. Monroe required that the length of the commercial be either 30, 45, or 60 seconds to correspond to actual commercial time allotments. He also required that the groups use one or more of the propaganda techniques discussed in the previous lesson.

Beyond those requirements, students had free reign over the content of their advertisements. Some groups chose to create superPAC-sponsored attack advertisements while others touted the

merits of their candidate. Although a few groups used the mini-camcorders provided by Mr. Monroe to act out and record parts of their commercials, by far the most used technique was the splicing of sound bites into the advertisements. Iconic moments from the campaign, such as Romney′s 47 percent and Obama′s "You didn′t build that" comments, became fodder for students′ commercials. Although the groups occasionally included silly elements into their commercials, such as a YouTube Gangnam style parody entitled "Romney-style", the advertisements were factually informative and demonstrated knowledge of relevant propaganda techniques.

A final way in which Mr. Monroe used technology effectively over the course of the semester was as a vehicle to better inform students about major issues and help them develop their political beliefs. Toward the beginning of the semester, for example, Mr. Monroe had students complete an online liberal/conservative quiz that suggested to students who they should support in the election based on their answers. Liberal/conservative quizzes are a staple of civics instruction (Journell, 2011a), but the one used by Mr. Monroe avoided the binary "right" or "left" distinction often found in online political assessments. The quiz used by Mr. Monroe (http://www.isidewith.com/presidential-election-quiz) asked students to give their opinions on a range of political issues, but also provided them the option of ranking each issue in terms of its importance to the student. When students were unfamiliar with a particular issue, the quiz offered a help button that explained the basic tenets of the issue in largely jargon-free language.

Whenever a major event occurred during the campaign, Mr. Monroe would also use the Internet to inform students of the issue as well as corroborate what was being reported in the national media. On multiple occasions, Mr. Monroe had students compare headlines found on the websites for Fox News, CNN, and MSNBC following a major campaign event as a way to account for media bias. He would then use websites to have students dig deeper into individual issues. After Romney′s 47 percent comment, for example, he showed the primary source video from the *Mother Jones* website followed by a pie chart from *The Washington Post* website that illustrated the breakdown of those who do not pay federal income taxes, which let the students determine for themselves the validity of Romney′s assessment of those potential voters. Similarly, following the debates, which he required that students watch for homework, he had students use FactCheck.org as a way of assessing the accuracy of each candidate′s claims.

When interviewed at the end of the semester, Mr. Monroe seemed pleased about the majority of his election instruction, although he rarely made explicit connections to his use of technology. Other than mentioning that he believed his students enjoyed the iMovie commercial assignment, he was more interested in the development of his students′ political understandings than the methods he used to achieve that goal. In other words, he did not view his technology instruction as particularly visionary or unique; rather, he saw technology as merely a tool to encourage his students′ political engagement.

DISCUSSION

In both of these classes students regularly used technology, and their teachers made a point to align their lessons around the laptops. For school administrators who evaluate teachers′ use of technology simply by the amount of time students spend with computers, both teachers could be

considered to have successfully utilized the technology made available to them. Yet, when assessing the teachers′ technology use in terms of a critical approach to understanding content, we would argue that Mr. Monroe demonstrated a more skillful use of the laptops than Mr. Fillmore.

When evaluating their use of technology using the TPCK framework, the differences between the two teachers becomes more apparent. Although Mr. Fillmore appeared confident in using technology, his knowledge of how to use that technology in conjunction with content and pedagogy was still developing. Knowledge about the technology teachers are using involves more than just possessing strong technological knowledge. Based on the number of websites and technology tools Mr. Fillmore used during his instruction, it is apparent he had knowledge of various websites available to him as a teacher and understood how, from a technical standpoint, to use them in the classroom. However, he lacked the understanding of how that technology aligned with the content he was teaching, as well as the pedagogical affordances and limitations for using that technology. Mr. Monroe, on the other hand, appeared to use technology with a clear purpose that aligned with his understanding of content.

This difference is perhaps most clear in the two teachers′ vision of how the semester would unfold. Mr. Fillmore knew he wanted to get his students involved with the election and also wanted do "most things" through the laptops. With the exception of an idea for using Twitter, which unfortunately was unable to be brought to fruition due to factors beyond his control, Mr. Fillmore did not indicate any specific ways in which he planned to use technology to further his pedagogical goals. Mr. Monroe, on the other hand, had already envisioned certain activities, such as the iMovie commercial project, prior to the start of the semester.

Fairbanks et al. (2010) argue that a teacher′s vision is fundamental to thoughtfully adaptive teaching, and they define commitment to a pedagogical vision as intending "to do more than dispense standard curricular content" (p. 164). It was apparent from our discussions with Mr. Monroe that he had clear objectives about what he wanted his students to gain from his election instruction (e.g., increasing understanding of polling data and electoral math), but Mr. Fillmore seemed content with just presenting information to his students and making them "more aware" of topics related to the election. As a result, Mr. Monroe′s use of technology was specifically targeted to meet his pedagogical goals, but Mr. Fillmore′s use of technology was often generic and could have been used in a similar fashion regardless of what content he chose to cover. In other words, we would argue that a lack of a clear vision limited Mr. Fillmore′s PCK, which in turn, limited his TPCK. One implication of this study, therefore, is that a clear, content-driven pedagogical vision appears integral to TPCK, although future research is needed to better understand this connection.

Another implication of this research is the need for increased training for social studies teachers working in schools with one-to-one laptop initiatives. After studying the Apple Classrooms of Tomorrow (ACOT) project for ten years, Sandholtz, Ringstaff, and Dwyer (1997) found that teachers progressed along a continuum when learning to integrate technology into their classroom instruction. In the entry stage, teachers are still learning the basics of technology integration; then, in the adoption stage, teachers are successfully using technology on a basic level in conjunction with existing instructional practices. They then progress to the adaptation

stage in which they use technology more frequently and purposefully before moving into the appropriation stage in which they use technology effortlessly to accomplish instructional and management goals. When teachers have fully mastered using technology in their classroom instruction, they are said to have entered the invention stage in which they use technology in new ways to promote 21st century skills and customize learning to meet students′ needs (Sandholtz and Reilly, 2004 and Sandholtz et al., 1997).

We consider Mr. Fillmore to be in the appropriation stage of technology integration. In this stage, teachers have mastered *using* technology in their classrooms and recognize the benefits of integrating technology in their instruction. Mr. Fillmore possessed strong technological knowledge and believed in the value of using technology in the classroom, using it often in his instruction. We would argue, however, that Mr. Monroe appeared to be in the invention stage, at least with respect to his political instruction. Mr. Monroe′s use of technology was specific to the content he was teaching, and he used technology as way for his students to think critically and create products that demonstrated authentic knowledge of content. It is important to note, however, that just because we observed Mr. Monroe at the invention stage in this study, it does not mean that he will remain there for the remainder of his teaching career. Since technology is always changing, the invention stage is an ever-evolving process of learning (Sandholtz and Reilly, 2004 and Sandholtz et al., 1997).

The question becomes, then, why did Mr. Monroe use technology more effectively than Mr. Fillmore? Certainly, their pedagogical visions and PCK played a part, but so too may have their level of experience in a technology-rich environment. According to the ACOT studies, reaching the invention stage takes, on average, three to five years (Sandholtz and Reilly, 2004 and Sandholtz et al., 1997). This was Mr. Fillmore′s first year teaching in a one-to-one environment, whereas Mr. Monroe had been doing so for three years prior to this study. It is possible that Mr. Fillmore, given his high technological knowledge, could progress to the invention stage in that same amount of time, although questions still remain regarding his PCK.

As one-to-one laptop initiatives become more common, however, it is incumbent for school districts and teacher education programs to hasten this process through professional development. Westin and Bain (2010) found that teachers in one-to-one laptop contexts often use the laptops as replacements for existing instructional materials, such as worksheets, without thoughtful consideration for how the technology should be integrated. Mr. Fillmore appeared to fall into that trap. Like many teachers who find themselves thrust into a one-to-one laptop initiative, Mr. Fillmore was given ubiquitous access to technology without explicit professional development pertaining to TPCK or project-based instruction that research has found to be essential to success in one-to-one environments (Spires, Wiebe, Young. Hollebrands, & Lee, 2012).

One way to help support teachers in their technology use is to provide them with professional development specifically focused on TPCK goals. Research shows that most social studies teachers find their professional development opportunities irrelevant or poorly delivered (van Hover, 2008), and with respect to technology, most professional development tends to focus on how to use a specific tool, leaving curriculum-based decisions about how, why, and when to integrate technology into the content area up to teachers (Harris, 2005 and Harris and Hofer,

2011). As a result, teachers often leave professional development training knowing the basics of how to use a tool but not how to make decisions that would demonstrate deep TPCK.

Hess and Zola (2012) argue that two tenets of successful professional development for civic education are that it is content-focused and ongoing, and findings from the ACOT studies also indicate that technological professional development is more successful when the focus is on content rather than on the technology (Sandholtz and Reilly, 2004 and Sandholtz et al., 1997). Curriculum-focused technological professional development may support teachers in reaching the invention stage by having them experiment with new ways to integrate technology to meet the needs of students trying to learn specific content. Mr. Fillmore, for example, tended to use universal technology tools, such as Google Docs and GoAnimate. What was missing in his classroom that would have been evidence of having reached the invention stage was the inclusion of specialized social studies technology tools.

Mr. Monroe′s instruction, however, illustrates the pedagogical benefits of specialized technology integration. The final implication of our study is that, when used critically, technology has the potential to transform civics instruction from a static content area in which students learn *about* government processes to an authentic, inquiry-based discipline. From a curriculum standpoint, Mr. Monroe taught nothing out of the ordinary; the typical civics curriculum requires that teachers cover the Electoral College, campaign finance laws, polling data, and propaganda techniques (Journell, 2010). Moreover, many of the tools that Mr. Monroe used, such as online electoral maps or iMovie, are not *that* innovative, and research has documented teachers using them in a variety of contexts (e.g., Journell, 2011a, Fehn et al., 2010 and Hofer and Swan, 2008). The difference, however, in Mr. Monroe′s use of these tools and how teachers typically use them is that he created a depth of understanding that allowed students to scaffold knowledge so that it built upon each other to paint a complex picture of the American political process.

Newmann and Wehlage (1993) argue that authentic instruction requires higher-order thinking, depth of knowledge, connectedness to the world beyond the classroom, substantive conversation, and social support for student achievement. We argue that Mr. Monroe′s election project met all of these benchmarks, and furthermore, we believe that he would only have been able to achieve this level of authenticity with technology. Take, for example, his use of the RCP electoral map. A textbook illustration of the Electoral College can provide students with a basic understanding of electoral math; however, the static nature of the textbook would not have allowed for continual status updates throughout the semester or the electoral predictions that were made possible by the fluid and manipulative nature of the RCP map. Similarly, students could have easily created two-dimensional propaganda advertisements with paper and pencil; however, such an activity would not have matched the authenticity of creating an advertisement for an "actual" television time slot.

Mr. Monroe′s purposeful and content-specific use of technology was ideal for civics instruction in that the technology was used to both inform students about politics as well as serve as a conduit for political decision-making. From a civics standpoint, however, one could argue that Mr. Monroe missed a golden opportunity for his students to act upon this newfound knowledge by having them become active participants in the election (e.g., campaigning for their candidate). As Kahne and Middaugh (2008) note, political engagement is a hallmark of quality civic

instruction, but one that is too often absent in public education. Technology, however, makes political involvement easier for students than ever before. The use of social media and other Web 2.0 tools offer untold opportunities for students to become engaged in the political process (Journell et al., 2013, Bennett, 2008, Kahne et al., 2012 and VanFossen and Berson, 2008), and the inclusion of such tools could have added an additional layer of authenticity to Mr. Monroe′s instruction. Although Mr. Monroe′s TPCK did not appear to include Web 2.0 tools during the course of our observations, as a teacher in the invention stage, it is likely that he will continue to experiment with various technological tools in future semesters.

CONCLUSION

The field′s understanding of TPCK, like technology itself, is constantly evolving. Although social studies educators are beginning to understand the theoretical underpinnings of TPCK, additional research that illustrates cases of teachers′ use (or misuse) of technology in social studies classrooms is needed. This study provided a cross-case comparison of two civics teachers in similar technology-rich environments who were teaching the same curriculum. Although we applaud both teachers for being willing to incorporate technology in their classrooms, their comparison underscores our assertion that simply using technology is not enough anymore. As the novelty of technology in public education continues to wane, it is essential that social studies educators turn their focus to better understanding TPCK and critical approaches to using technology.

The natural question, then, is how best to achieve these goals? Certainly, TPCK-specific professional development for practicing teachers, especially those being asked to teach in one-to-one laptop environments, seems necessary. We believe, however, that these findings also have implications for social studies teacher education. Preservice teachers too often learn about content, methods for teaching content, and educational technology separately (Swan & Hofer, 2008) but then are asked to combine these knowledge bases on their own during student teaching. The experiences of Mr. Fillmore and Mr. Monroe suggest that TPCK is not a way of thinking that comes naturally once teachers are given access to technology; rather, TPCK develops over time and requires a nuanced understanding of both content and pedagogy. Teacher education programs should hasten this development by purposefully combining preservice teachers′ knowledge bases over the course of their programs. As access to classroom technologies continues to become more ubiquitous, more novice teachers are going to be asked to teach in technology-rich environments, so it is imperative that they learn to think from a TPCK standpoint before entering the field as professionals. Further research is needed to determine best practices for developing this type of TPCK understanding among preservice teachers.

From a civic education standpoint, these findings also suggest that teachers′ increased TPCK may result in more critical civic learning opportunities for students. Given students′ reliance on technology in their personal and, increasingly, their academic lives, we believe it is reasonable to suggest that technology is essential to achieving the high quality civic experiences envisioned by leading scholars within the field (e.g., Kahne & Middaugh, 2008). In other words, we see a direct line between TPCK and student civic engagement, and we view Mr. Monroe's instruction as offering a glimpse into the potential that critical uses of technology offer civic education.

Certainly, as technology continues to become more interactive and accessible, it will offer even more possibilities for civic education, but the findings from the present study suggest that simply having access to the technology will not be enough to guarantee that it is used to its potential. Future research on the connections between TPCK and civic education are needed, but if teachers are versed in both the "how" and "why" of technology integration into civic instruction, our findings suggest that the outcome could be greater student civic awareness and engagement.

APPENDIX A

Interview protocol

Initial interview

(1) How many years have you been teaching?
(2) What is your educational background?
(3) Have you won any awards for your teaching?
(4) How would you describe Madison High School?
(5) How would you describe the honors and general level classes at Madison?
(6) How would you describe the political climate of Madison? Of the surrounding community?
(7) How would you describe the typical Madison student?
(8) How would you characterize your classes with respect to political identity?
(9) Where do you get your political information?
(10) What is your teaching philosophy?
(11) Describe how you plan to teach the presidential election this fall
(12) What do you think will be the big issues in this election?
(13) Who will you vote for in the election?
(14) Do you plan on telling your students who you plan to vote for? Why or why not?
(15) Do you consider yourself a Democrat or a Republican?
(16) How does the political climate of the school/community affect your instruction?
(17) What steps do you take to ensure that your class is a politically tolerant environment?

Post interview

(1) How do you think your coverage of the election went this semester?
(2) How do you think your election project went?
(3) How well do you think your students got involved in the election?
(4) What specific things seemed to work with regard to getting students interested in the election?
(5) If you could go back and do something different, what would it be? Why?
(6) What do you hope your students took away from this experience?
(7) Do you think they understood how a presidential election worked?
(8) Do you feel you were able to keep a good balance between liberal and conservative viewpoints? Why or why not?
(9) How did the school/community political climate affect your instruction?
(10) Do you think your students could correctly identify who you voted for?

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