Struggling to Move Beyond Projection: A Case Study of Instructional Use of an Interactive White Board in Elementary Social Studies

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Abstract

Interactive whiteboards (IWBs) are increasingly prevalent in U.S. classrooms. Yet, little is known about how this tool is being used to teach social studies. This case study through classroom observations, interviews, and student focus groups examines how two fifth-grade teachers use t he IWB to teach U.S. history. The data indicate that when the teachers were observed utilizing an IWB in their social studies instruction, they shifted away from the student-centered instructional practices observed when they did not use the device. Their IWB-centered instruction was teacher centered, utilizing the device predominantly for projection. This trend is likely due to a lack of confidence in how to integrate the IWB technology with social studies pedagogy, as well as a perceived lack of ready-made social studies materials for the IWB. Hammond and Manfra's (2009) giving-prompting-making model of technology-based social studies pedagogy was used to frame the teachers' instructional practice.

For two decades much has been written about the potential impact of technology on social studies education, both as a pedagogical tool and as a topic for exploration (Whitworth & Berson, 2003). In "Which Way to the Sleeping Giant," Martorella (1997) called for social studies educators to embrace technology integration for both its potential to impact the classroom and the world outside the school walls. Martorella rightly predicted a world dominated by the visual domain, where individuals can use technology (through social media) to create an alter ego and where the omnipresence of technology in a connected world has altered their understanding of citizenship.

Teachers, however, have been slow to infuse ubiquitous technologies, such as the smartphone. Classrooms today closely resemble the classrooms of the early 20th century. The world outside the school wall, where 92% of teens access the Internet daily, most often from a smartphone (Lenhart, 2015), is not reflective of the reality in most schools, where students are not allowed to use their phones in class (Lenhart, Ling, Campbell, & Purcell, 2010).

Since Martorella's call to action, much has been written on the potential benefits of infusing technology into the social studies. Publications have addressed social studies teachers' use of the Internet (Sheffield, 2011; VanFossen & Waterson, 2008;), digital primary sources (Friedman, 2006; Lee, Doolittle, & Hicks, 2006), and digital filmmaking (Manfra & Hammond, 2008; Sheffield & Swan, 2012; Swan, Hofer, & Levstik, 2007). However, little has been done to explore the way in which interactive white boards (IWBs) are used in the social studies classroom.

SMART™ Technologies (2013) reported that as of March 2012, 2 million SMART boards had been installed in K-12 classrooms worldwide. At more than $2,000 per board, the total spent on classroom SMART boards to date was more than $4 billion, exceeding the annual gross domestic product of 38 nations (World Bank, 2013).

The SMART board is but one of the many IWBs available on the market, although it has dominated the field since 1991 (Quillen, 2012). An IWB is a presentation device linked with a computer and a projector that can be directly controlled through the board, either by touch or writing tool (Somyürek, Atasoy, & Özdemir, 2009).

Originally designed for business applications, the IWB has been touted as having potential to enhance teacher practice (Marzano, 2009). IWB software features identified as being beneficial to teachers include drag and drop, hide and reveal, zoom in, and annotation (Deaney, Chapman, & Hennessy, 2009). In a survey conducted in the United Kingdom, 55% of primary and 44% of secondary teachers perceived that IWBs saved them time in lesson planning and instruction. This response was likely due to the ability to produce, modify, and share materials digitally (Kitchen, Finch, & Sinclair, 2008).

The existing research on IWBs in education has mixed results. Early studies of the instructional use of IWBs suggested that the technology had a positive impact on student engagement (Beeland, 2002). Students were more participatory in lessons that primarily utilized the board's projection capabilities over the lessons that utilized its interactive features. Generally, both teachers and students had a positive perception about the potential of the IWB (Higgins, Beauchamp, & Miller, 2007). However, findings from a 2012 survey indicated that although IWBs had the potential to facilitate learning teachers were not able to create a constructivist learning environment in which students could be actively involved, nor did they have time to figure out how to create such an experience (Türel & Johnson, 2012). Additionally, IWB-related lessons observed in six Australian schools were largely teacher-centered, whole class instruction, in which teachers maintained control of the technology, thereby removing the interactive component of the IWB (Kearney & Schuck, 2008).

Another limitation to student interaction with IWB in a whole class setting is that only one student can utilize the board at a time (Mohon, 2008). As stated by Higgins et al. (2007), "An IWB may be technically interactive, but may lead to less interactive and more didactic teaching" (p. 219). These findings suggest that despite initial perceptions, the IWB may not provide better instruction, assuming that better instruction is defined as incorporating student-centered learning.

Most studies exploring the educational use of IWBs are focused on mathematics and literacy (SMART Technologies, 2006). A review of the literature indicates that only a handful of published studies have examined the use of IWBs in the social studies. A case study conducted in the United Kingdom examined the IWB-related instructional practices of one teacher during a 3-week instructional sequence (Deaney et al., 2009). Additionally, a multiple case study, apparently related to the Deaney et al. study, examined how the IWB can be used to encourage student dialog (Mercer, Hennessy, & Warwick, 2010).

Much discussion has occurred around the potential of the IWB, and research has been conducted examining student engagement teacher use of an IWB. However, the vast majority of the studies were conducted in non-social studies settings. This study addresses this lack of social studies-related IWB research literature by focusing on IWB instructional practice in a fifth-grade United States history class. Additionally, the study aims to explore how two social studies teachers who are neither prolific users of technology nor phobic of technology integration utilized the IWB, a device that is increasingly prevalent in the 21st-century classroom. Specifically, the study was designed to address the following research questions:

- How do the participating teachers utilize the IWB in their social studies instruction?
- Does their instructional practice with the IWB differ from their instructional practice without it?

Conceptual Framework

The available literature on the instructional use of IWBs indicates that Mishra and Koehler's (2006) technological pedagogical content knowledge (now referred to as technology, pedagogy, and content knowledge, or TPACK; see Figure 1) concept is an informative framework to use in examining teacher use and perception. Building upon Shulman's (1986) concept of pedagogical content knowledge (PCK), TPACK is the overlay of digital technology upon the construct of content-appropriate pedagogy. According to Mishra and Koehler, the key to a teacher's instructional use of digital technology is the understanding of how to use technology within the parameters of both pedagogy and content.

Koehler and Mishra (2008) described the interaction among these three factors as a "dynamic equilibrium." However, they placed heavy emphasis on the changing nature of technology and the impact that such change would have on the balance. Manfra and Hammond (2008) have critiqued the overemphasis of the impact of technology in the TPACK construct, explaining that a teacher's pedagogical beliefs are the most significant influence on the technology-related planned and enacted curriculum. This assertion supports Ertmer's (2005) position that the presence of or lack of technology integration that encourages *student use* is mediated by the teachers' teaching philosophy and practice.
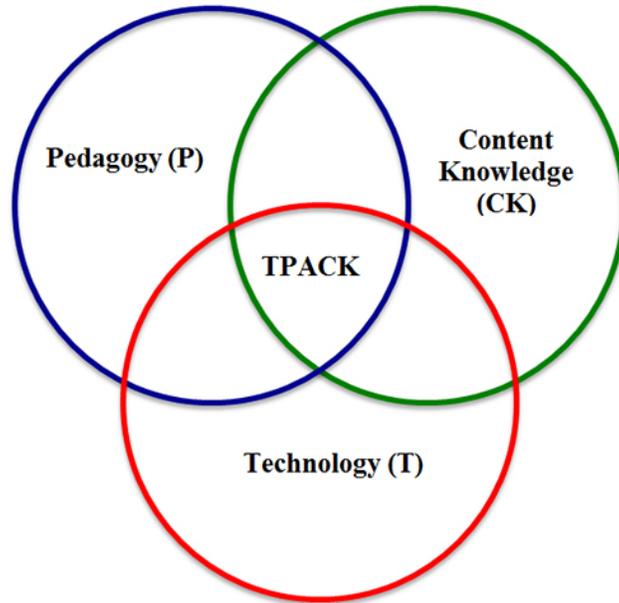
Figure 1. *Technology, pedagogy, and content knowledge (TPACK), as described by Mishra and Koehler* (2006).

Hammond and Manfra (2009) described a giving-prompting-making model for examining social studies pedagogy within the TPACK framework. In this model instruction can be classified into the teacher-led direct instruction of the giving mode of instruction, the teacher-scaffolded student exploration of the prompting mode, and the constructivist approach of the making model, in which students learn through product creation. In this model Hammond and Manfra stated that TPACK should actually be represented as the nested expression (T(PCK)), as a teacher's PCK is the driving force in instructional practice. Technology is merely a tool to be used to further instructional goals.

Sheffield (2011) argued that looking for a single-cause explanation of teacher instructional technology integration is inappropriate, suggesting that a teacher's technology integration is mediated by a number of factors, including philosophy, access, and efficacy. Prior studies of IWB use have indicated that contextual influences, such as teacher philosophy and efficacy, likely impact teacher instructional use of an IWB. Teacher-centered instruction will typify a teacher's IWB use in two instances: (a) if the teacher's instructional style is naturally teacher centered, and (b) if the teacher lacks efficacy in using the IWB (in which case, teachers will revert to a teacher-centered style, despite their teaching philosophy; DiGregorio & Sobel-Lojeski, 2009-2010; Mohon, 2008; Türel & Johnson, 2012).

The impact of factors beyond changing technology does not lessen the potential of the TPACK framework to examine a teacher's instructional use of technology. Teaching philosophy and pedagogical practice are addressed in the PCK portion of the framework; and teacher efficacy with technology is captured in the technology layer. What is not addressed in the TPACK framework is teacher access to functional technology. Both teachers included in this case study had an IWB permanently mounted in their

classroom; therefore, the potential influence of technology access was largely mediated in this study. Since the factors previously identified as influencing teacher instructional use of technology likely impacted the teachers in this case study, the TPACK framework is a logical construct with which to examine their instructional practice.

Methodology

Participants and Context

This study was conducted at Riverside Elementary School, an urban Title 1 school located in a midsized Midwestern city. Of the school's 398 students, 97% received free or reduced lunch, 49.5% were African American, and 43.7% were White. The school is a professional development school for the University of Louisville, one of the region's large state universities. The staff is comprised of 32 teachers (U.S. Department of Education, 2011). Nearly every teacher in the building has a mounted IWB available for classrooms use, and all teachers have a laptop provided by the school district.

The two participating teachers, Ms. Adams and Ms. Brown (both pseudonyms), teach fifth grade. Ms. Adams is a 13-year veteran teacher with a master's degree. She has had a variety of technology-related professional development, including trainings on basic IWB use and mathematics-specific IWB training. Ms. Brown is a fourth-year teacher with a master's degree, who recently received a district-level award for outstanding teaching and community involvement. Teaching is her second career. She reports receiving extensive technology-related preparation in her education coursework and basic IWB training through the school. Both teachers received 2 hours of professional development with a SMART Technologies trainer, emphasizing tools of the IWB that may be useful in the social studies.

Class A (taught by Ms. Adams) included 22 students, and Class B (taught by Ms. Brown) included 17 students, most of whom had looped with their teacher since the second grade. Both classes' demographics closely resemble those of the school. Students in both classes report frequent IWB use throughout their time at Riverside.

Through the professional development school collaboration between the University of Louisville and Riverside Elementary, I became familiar with the school's teachers, their teaching assignments, and their approach to teaching. Fifth grade was identified as being the optimal grade within which to view social studies instruction, as it is most heavily emphasized as a result of the state's practice of assessing social studies only in the fifth grade. Riverside typically has four teachers assigned to each grade level, and the fifth grade was no exception. All four taught social studies, as the school was not departmentalized.

Ms. Adams and Ms. Brown were identified for this study because of their similar teaching philosophy, the presence of an IWB mounted in their rooms, and their pattern of technology integration. Neither teacher was identified as being an early adopter or a resistant user of instructional technology. These two teachers used technology in their instructional practice, but it was not pervasive in every lesson. In other words, they are examples of what could be seen as median technology instructional users—neither always using technology nor never using it. They used technology when it enhanced their instruction and aided them in addressing their instructional goals. The teachers and their classes were treated as a single case study because the two teachers plan together, provide similar learning experiences, work with similar students, and function within the same school community.

Data Sources and Analysis

This study utilized a simultaneous QUAL+quan mixed-methods research protocol, incorporating both qualitative and quantitative data collected concurrently (Onwuegbuzie & Leech, 2005; Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2009). Data were collected utilizing classroom observations, individual teacher interviews, a combined interview with the two teachers, and two student focus groups. The use of multiple data sources provides the opportunity to triangulate information gleaned from multiple perspectives, thus facilitating a more holistic understanding of the data and enhancing the trustworthiness of the study findings (Merriam, 1998).

As this study examined instructional practice and the degree to which the use of an IWB had an impact on the teachers' instruction, a systematic approach to observation that captured patterns in observed behavior was warranted. An observation protocol known as scan sampling was utilized to sample the teachers' instructional practice. In this approach the researcher scans the room or group and records behavior at a predetermined interval, every 3 minutes in this study. These recorded scans serve as a snapshot of classroom activity (as in Altmann, 1974). These scans, or snapshots, become data points that could then be classified into categories of instructional practice and analyzed using descriptive and nonparametric statistics. Teacher instructional practice with the IWB was compared with the teachers' instructional practice without the IWB through chi-square analysis, in which the expected value was derived from the pattern of instruction established without the IWB.

In addition to providing quantifiable data points with the scans, this systematic approach to observation reduces possible distraction from nontypical behaviors. In any classroom observation the researcher's attention can be drawn to behaviors outside of the norm that may or may not be pertinent to the research questions studied. A regular pattern of observation scan can lessen the impact of nontypical behaviors in two ways.

- If the nontypical behavior is not pertinent to the research questions, the regimented pattern of observations will redirect the researcher from the distracting behaviors and back to those being studied.
- If the nontypical behavior is germane to the research questions, the regular interval of observation scans will lessen the potential to overemphasize the behavior in the observation notes, which could lead to a distorted description of the research findings.

In either scenario, a systematic approach to observations helps to maintain observation continuity.

The 3-minute scan cycle records were maintained in conjunction with a continuous description of observed class activity, which provided contextual information for the behaviors observed in the scanned snapshots. This 3-minute observation cycle resulted in a number of scans per lesson, providing an adequate sample for analysis. At each 3-minute mark, the class was surveyed, and the description of the instructional activity was recorded and classified as either teacher-centered or student-centered instruction (Appendix D).

The classification of the scanned behaviors as teacher-centered or student-centered instruction was based on the following definitions. Teacher-centered instruction was identified as instructional activities led by the teacher, including direct instruction, class discussions, read-aloud, and other didactic strategies. Student-centered instruction was

identified as strategies requiring students to work either with a group or as individuals to process information, solve problems, and often create a product (Jacobsen, Eggen, & Kauchak, 2009).

These 3-minute scans were then analyzed using descriptive statistics and chi-square analysis. Information obtained from a continuous recording of observed behavior, gathered in conjunction with the scan samples, was used to provide context for the instructional activities.

Class A and Class B were each observed on eight separate occasions over 8 months. The class observations lasted the length of each day's social studies instruction. Lesson durations ranged from 27 to 90 minutes, with a mean duration of 57 minutes in Class A and 61 minutes in Class B.

Ms. Adams and Ms. Brown each participated in one formal semistructured (Merriam, 1998) individual interview lasting 30 minutes. The questions were designed to gather information about the teachers' education and teaching experiences, teaching philosophy, experiences with instructional technology, IWB-related professional development, and prior experiences integrating IWB into their teaching (Appendix A). Additionally, the two teachers participated in a combined interview at the conclusion of the classroom observations sequence lasting approximately 30 minutes. The combined interview was designed to provide the participating teachers with the opportunity to reflect, with the researcher and with each other, on their instructional use of the IWB in their social studies lessons and to ascertain their perception of the IWB in the social studies.

In addition to the teacher interviews, two focus group interviews, lasting approximately 45 minutes each, were conducted with five members each of Class A and Class B. The students for the focus groups were selected to mimic the class racial and gender configuration. The focus groups were conducted in order to provide students in the two classes the opportunity to share their perceptions of the instructional use of the IWB within their social studies classes and to triangulate the information gleaned from observations and teacher interviews (Appendix B).

The interviews and focus groups were recorded and dialog transcribed. The transcripts of the interviews and focus groups were analyzed using ATLAS.ti qualitative analysis software (http://atlasti.com/qualitative-analysis-software). Initial analysis of the interview and focus group data utilized a blended approach of a priori codes, derived from the literature, and open coding. The a priori codes included teacher behavior, teacher efficacy, and student engagement. Following an initial analysis of the interview and observation data, the a priori codes were revised, as the initial three codes were deemed insufficient to reflect all of the intricacies of the data collected.

Through the constant comparative method (Glaser & Strauss, 2010) the codes were revised, resulting in three broad themes: Teaching Behaviors, Barriers to Use, and Student Engagement. Within each of these three themes are multiple codes (Appendix C). The theme Teaching Behaviors includes codes derived from the data collected through both classroom observations and teacher interviews. The Teaching Behaviors theme included the following codes: pedagogical approach, teacher-centered learning, student-centered learning, IWB as projector only, and IWB use other than projector. The codes from the other two themes, Student Engagement and Barriers to Use, were derived through open coding of the student focus groups and teacher interviews. The Student Engagement theme incorporated the novelty factor associated with the implementation of the IWB and the kinesthetic nature of the IWB technology. The Barriers to Use theme subsumed the initial a priori code of Teacher Efficacy; three additional codes were added:

availability of social studies materials, management of the IWB, and including all students.

Data collected from the observations and the interviews were analyzed using a parallel mixed data approach (Teddlie & Tashakorri, 2009). The quantitative data garnered through the scan samples were analyzed separately from the qualitative information from the continuous observation notes, teacher interviews and student focus groups. The themes uncovered through the constant comparison method were merged with the findings of the descriptive and nonparametric analyses of the scan sampling, creating a holistic picture of the teachers' IWB social studies instructional practice.

Findings

Teaching Behaviors

Pedagogical beliefs. Both teachers described their instructional approach as being student centered, emphasizing classroom community and student interaction, which are hallmarks of the powerful social studies teaching championed by the National Council for the Social Studies (2008). Their approach to teaching was epitomized by the following quotation by Ms. Brown.

> I feel like they have to feel safe, which means they know what the expectations are and they know what the rules are. And they have to feel accepted....They are very kinesthetic, they have to learn through movement, they have to learn through an experience. Their life experience is huge but their world experience is not, and so we have to give them the experiences, and you can't do that by just talking to them.

Ms. Adams' statement on how students learned concurred with this quotation, "The students need to be involved and very hands on...in an environment where they feel like they can take a risk."

Both Ms. Adams and Ms. Brown created a classroom environment that typifies their emphasis on student engagement and collaboration. Both rooms were rich in visuals and materials and were conducive to collaborative learning. Content related posters were prominent, as were the multiple shelves of content-related books and reading material for student silent reading time. Both teachers arranged their classroom layout with their students sitting in groups. Ms. Adams' students sat with three or four other students with their desks pushed together to form a table. Ms. Brown's students were placed in larger groups of six to eight students, which could easily be subdivided into smaller groups as necessary.

The difference in the two room arrangements is attributable to classroom size. Ms. Adams had a slightly larger room and was able to arrange for more walking space than could Ms. Brown. Neither teacher utilized a teacher desk, both preferring to use a kidney shaped table that could also be used in small group instruction. Both teachers' IWBs were mounted at the front of the room, with their district supplied laptop and document camera. Two desktop computers were available for student use in both rooms. The teachers' decisions related to room and materials arrangement indicated a focus on student needs.

Both teachers valued student agency in the learning process. In nearly every observed lesson, students were required to discuss, predict, synthesize or gather information

(Appendix D). Rarely did the teacher lecture. Observed teaching practices most closely resembling teacher-centered lecturing included read-alouds, class discussions, and providing directions. Examples of observed student-centered lessons included group projects, learning centers, and History Alive activities (Teacher Curriculum Institute, 2010).

One lesson typifying their student-centered approach explored Colonial Williamsburg though learning centers. At each center, students were expected to complete a task involving either a primary source document or image, perform a kinesthetic activity, and then write a response to the task. Through the center experience students examined the diverse perspectives of the city's residents (e.g., children, slaves, and merchants) and aspects of the daily life in Colonial Williamsburg (e.g., religion, education, and government). This learning experience was evidently a memorable one for the students, as they referenced it in the focus group interviews several months later.

Observed teaching practice. Although they identified a preference for student-centered learning, both teachers utilized teacher-centered instructional practice in 53.1% of the non-IWB scans and 66.5% of all scans. Examples of teacher-centered instruction observed during this study included image analysis, reading aloud from supplemental text (e.g. Philip Hoose's, 2001, *We Were There, Too!*), class discussions and questioning, review games, the projection of websites and videos, and the use of SMART™ activities.

A total of 319 three-minute scans were recorded during the nearly 16 hours of classroom observations, conducted over 8 months (Table 1). Of these 319 scans, 152 were made in Class A and 167 were made in Class B. The IWB was not used in 228 (71.5%) of the total scans; teacher-centered behavior accounted for 121 of the 228, or 53.1%. The IWB was utilized in 91(28.5%) of the total scans; all observed IWB-associated scans were identified as teacher-centered instruction. A chi-square test of goodness of fit was performed to determine if the teachers' instructional practice with the IWB differed from their instruction without the IWB. These two teachers' instructional practice with the IWB varied significantly from their observed instructional practice without the IWB, X^2 (1, N = 91) = 80.4, $p <$ .001, indicating that the inclusion of the IWB altered their typical instructional behaviors in the observed lessons.

Table 1
Three-Minute Scans of Instruction

Scans (Total = 319)	Number of Scans
Scans with IWB	91
• teacher-centered	91
• student-centered	0
• projection only	57
• interactive use	34
Scan without IWB	228
• teacher-centered	121
• student-centered	107

The teachers' emphasis on hands-on instruction appeared to align with the kinesthetic and interactive properties of the IWB often touted in the early literature (Beeland, 2002). However, neither teacher was observed using the IWB in student-centered instruction. Despite the fact that they expressed an interest in a kinesthetic and student-centered approach to instruction, student use of the IWB was not observed. Of the 107 scans identified as student-centered, all of them occurred when the IWB was not in use; student-centered instruction accounted for 46.9% of the non-IWB scans, and 33.5% of all scans.

When the teachers used the IWB, they used it primarily as a projection device (57 of the 91 scans, or 62.6%). This type of use could be accomplished with a computer and a projector. In the remaining 34 (37.4%) scans associated with IWB use, the teachers utilized one of the interactive features of the IWB, typically the touch, writing, or drag-and-drop interactive features. In two observed lessons, out of the 16 total observed lessons, the teachers used the IWB capacity to write directly on a document or presentation and save the information.

In these two lessons, the teacher utilized the board to complete a whole-class graphic organizer based on a nonfiction text and to complete a vocabulary activity related to a civil rights lesson. A chi-square test for goodness of fit indicated that the teachers' preference for projection usage was indeed significant, $X^2(1, N = 91) = 5.82, p < .05$, as opposed to utilizing its interactive tools.

Barriers to Use

Teacher efficacy. Both teachers indicated that they found difficulty in finding ways to incorporate the IWB in social studies student-centered learning. Both teachers identified small group instruction, with the IWB serving as a center, as having the best potential to utilize the technology in student-centered instruction. However, neither teacher was observed utilizing the IWB in small group learning in the social studies. Ms. Brown stated, "I think with math it's easier to put a small group at the SMART board and that be a station than with the social studies."

The perceived discrepancy is likely an artifact of teacher comfort with how to use the board in the social studies and the perception of there being more ready-made IWB-based activities for mathematics. Both teachers had participated in multiple professional development sessions emphasizing the use of an IWB in mathematics instruction. They had been exposed to and had tried a variety of IWB-based tools for mathematics and were, consequently, comfortable using the device to teach the discipline.

These two teachers received only 2 hours of professional development related to social studies specific IWB uses, however. Although they were exposed to a number of IWB tools such as highlighting, writing on a document or image, and saving the notations, which are ideally suited for the small group analysis of primary sources, they did not implement these tools in a small group setting. When they did have students analyze documents and images on the IWB, they used a whole class setting.

Neither teacher was seemingly able to reconcile how they used the board in small group instruction in mathematics with their social studies instruction. The teachers' expressed confidence in using the IWB to teach mathematics, developed through professional development and personal experience, had not translated into a generalized comfort with the technology. Both teachers expressed a lack of confidence in the best way to use the IWB tools to teach the social studies and, therefore, infrequently used the tool in their

social studies lessons. Their limited experience with using an IWB to teach social studies is not surprising, if the available literature is an indication of instructional use. At the time of this study, few of the articles written about IWB instructional use addressed how to utilize the device in the social studies.

Resource availability. Despite their frustration with implementing the IWB in the social studies, both teachers felt that they were able to integrate the board effectively into their mathematics instruction. The reason for the discrepancy, according to the teachers, was a lack of social studies resources available on the SMART Exchange (http://exchange.smarttech.com), a repository of SMART board lessons constructed and shared by teachers. Ms. Adams shared that "in math you can type in 'place value' and get 200,000 different hits, and in social studies it [a similar search] is like five." The few resources available were not interactive in the way that the two teachers perceived the mathematics lessons to be.

An example mathematics lesson, as described by Ms. Adams, was a place value lesson involving a 10-sided die. The students were focused on the board; waiting to find the number they needed to complete the task. She found the students to be engaged in the entire interactive lesson. The social studies SMART Exchange lessons were, according to Ms. Adams, largely "match, and draw the line ... not interactive and no more engaging" than what they were already doing. In fact, they were potentially less engaging than the teachers' typical non-IWB instruction. The teachers found the social studies lessons on the Exchange to be little better than a worksheet, which did not fit within their approach to teaching the social studies.

The teachers' reported efficacy using the IWB in mathematics is more likely an artifact of ready-made materials rather than a true comfort with the technology. Indeed, the teachers cited a lack of efficacy in creating lessons for the IWB as a barrier to effective use. They knew what effective social studies instruction looks like for their students. They were not seeing it in the resources available on the SMART Exchange. They did not feel they had the knowledge to craft effective IWB social studies lessons nor the time to learn how to do so.

Time commitment. Ms. Brown indicated that she saw the benefits of using an IWB in her instruction, especially the ability to save information from the board:

> I am getting better at being able to stay in the SMART board software and then go into something else so I can write on it...being able to save everything I've done so I can add to it or go back to it. At first, it seemed like extra work, but now the more comfortable I am becoming with it I can see how it would make teaching easier.

Her response corresponds with the findings of Kitchen et al. (2008) that teachers viewed IWB as potentially saving them time. However, both Ms. Adams and Ms. Brown described a concern with the amount of time it takes to become proficient with the IWB. Ms. Adams' frustration was evident in the following statement:

> If I could spend a week sitting in front of a computer finding things and putting things together, sure I could probably use it [the IWB] really well, but when I have ten minutes here and ten minutes there, I can't do it.

Ms. Brown also expressed frustration with "not having enough time to play with it [the IWB] and practice with it.... It just seems like it takes so much time to even get it to work

right that it just doesn't seem worth it." Although her IWB was functional, Ms. Brown lacked confidence in how to best utilize the device in social studies instruction, making IWB-driven instruction both cumbersome and time consuming.

Student Engagement

Both teachers identified the IWB as having potential to impact student engagement positively, mostly through a novelty factor and kinesthetic interaction with the device. Ms. Brown explained, "They (the students) are very kinesthetic and they need to be able to touch things, so on this level the SMART™ board can appeal because they can come up and touch it." Ms. Adams cautioned that the novelty of the IWB would wane if the activity was not engaging: "If I just started dragging words, after a while I think it [the IWB] would lose its flavor." When describing a unit on slavery, in which they regularly utilized the IWB to project a Scholastic website exploring the Underground Railroad (http://teacher.scholastic.com/activities/bhistory/underground_railroad/index.htm), Ms. Adams stated, "I don't know that the SMART board made them more interested [in the lesson]." Ms. Brown replied, "I think that they definitely enjoyed the SMART board, but it could have been just the thing that we had. I think the Scholastic website was unique because of the variety of stuff on it."

The teachers utilized Scholastic Inc.'s (2013) website, The Underground Railroad: Escape from Slavery, which includes image analysis, reading, maps, audio recordings, and writing prompts related to slavery and the Underground Railroad. Ms. Adams felt that it was the use of primary sources that students liked from the lesson, rather than the delivery mode (i.e., the IWB). She also questioned whether or not the IWB was necessary to compete the task, "even with the Scholastic lesson, it would have been just as easy to hit on the computer and those things [the resources] come up." In these lessons, the IWB was utilized as an LCD projector, which was typical of the majority of their IWB usage.

Although they found the kinesthetic opportunities with the IWB intriguing, both teachers expressed concern that only one student can use the board at a time. Ms. Adams expressed the dilemma in the following statement, "If I have one kid come up, then what is everybody at their seats doing?" Ms. Brown expanded on this potential issue with integrating an IWB.

> The kids definitely learn through movement and also through touch, just putting their hands on something creates an experience for them...on that level, the SMART board is great, because they can come up and touch and have the connection with it, but you have to make time for everyone to be able to come up, to have that opportunity....They (the students) would feel disappointed if everyone didn't get a chance to come up and almost may not even grasp what I wanted them to get from it, just because they missed out on that experience. But maybe if we were using it all the time it wouldn't be as big of a deal if everyone didn't touch it each time.

These two teachers' concern about how to engage all students in a lesson where only one student can use the IWB is reflective of the literature. Mohon (2008), found that students loose interest in lessons when only one student can have tactile interaction with the board and that when students are touching the board lesson pace is slowed.

Students in the focus group interviews agreed with their teachers that the kinesthetic capacity of the IWB was engaging to them. Ken, a student in Class A, stated, "You get to touch it with your finger and you get to write on it with your finger, too." As his classmate

Jenny stated, "You can do it [write on the board] with your finger and you know that we don't have ink in our fingers, so it's awesome!" The interactive feature of the IWB's writable screen was highly engaging for the students interviewed.

Unfortunately, in the social studies the students reported little student use of the IWB. When asked who used the IWB more in the social studies, one student replied, "Ms. Adams clicked on it [the IWB] more and stuff, but in math we used it more." Not surprisingly, the students felt that the teacher frequently used the IWB in the social studies. Statements made in the combined teacher interview verified the students' impression of IWB instructional use in the social studies

Discussion

Why did these two teachers, who stated that their social studies pedagogy was student centered and were observed employing student-centered instruction when the IWB was not used, rely solely on teacher-centered instruction when it was used? The TPACK framework, as interpreted by Hammond and Manfra (2009) may be useful to explain this discrepancy (Figure 2).
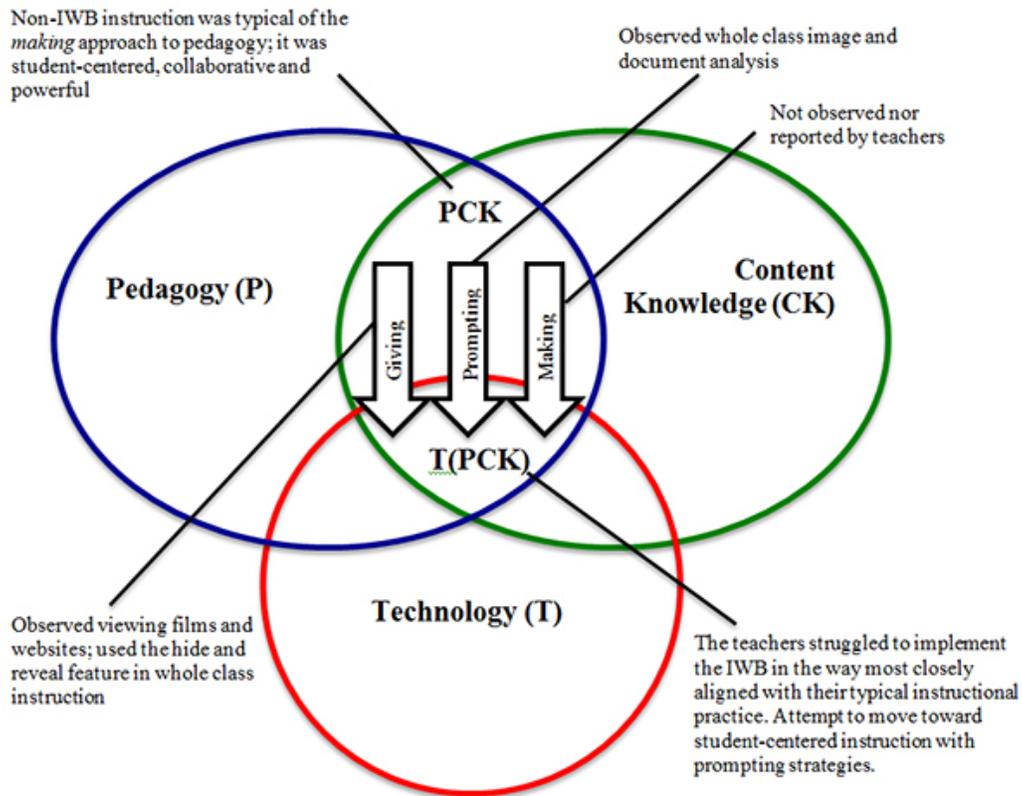

Figure 2. *Case studies TPACK as mediated through Hammond and Manfra's (2009) giving-prompting-making model of social studies pedagogy.*

Both of these teachers are effective social studies teachers, as indicated by consistent examples of powerful social studies instruction when the IWB was not in use. Yet, they

did not demonstrate such usage with the device. They relied heavily on teacher-centered instructional practices, similar to the giving and prompting pedagogies described in Hammond and Manfra (2009). In these approaches the teacher is central to the dissemination of information, either as the direct conduit or as a guide for student exploration.

In giving pedagogical practices, the teacher directs the students to content using structured learning experience similar to the teachers' use of the IWB to show videos, play review games, or to do the reveal activities (e.g., the Martin Luther King activity seen in the seventh observation in Ms. Adams' class). Prompting pedagogies require more scaffolding; students are asked to make observations and draw conclusions, similar to the teacher-supported analysis of digital images and primary sources in the previously mentioned Underground Railroad unit.

Hammond and Manfra (2009) indicated that teachers who teach information-rich content with high stakes testing, which these teachers do, often demonstrate a giving approach to pedagogy. However, when the IWB was not utilized, Ms. Adams and Ms. Brown were observed regularly utilizing student-centered instructional practices, similar to the making pedagogical approach, in which students learn through product creation.

Why was there an apparent disconnect in practice? The fact that the teachers ventured into the prompting pedagogical approach, requiring the students to engage with the content through whole-class document and image analysis, suggests that the teachers were attempting to use the IWB in their preferred student-centered instructional approach. However, as both observations and interviews indicate, they were not able utilize the device in ways that required the students to create a product or work in small groups for self-guided analysis. This gap can be attributed to a lack of efficacy with the IWB.

During both their individual and combined interviews the participating teachers repeatedly expressed frustration about their lack of comfort with best practices for utilizing the IWB in their social studies instruction. This lack of confidence stemmed from two sources: a lack of experience and a lack of ready-made resources.

Although the teachers received professional development on how to use the IWB, all but 2 hours of it was focused on functionality or use in other subjects, such as mathematics and reading. Indeed, both teachers expressed confidence in how effectively to utilize the IWB with a student-centered instructional approach in other subjects, particularly mathematics. However, they did not feel a similar confidence in the social studies. When using the IWB in the social studies, they largely relied on a teacher-centered, projection-only approach. The board became a large computer screen instead of an interactive teaching tool.

The students interviewed in the focus groups also indicated that the IWB was used more frequently during subjects other than social studies, which was supported by both observations and teacher interviews. A disconnect appeared between the teachers' knowledge of what the board can do, as seen in other content areas, and their ability to translate that knowledge to the social studies. This discrepancy may be linked more to a plethora of ready-made IWB lessons in mathematics than to the teachers' actual comfort with the technology. In fact, despite their use of the IWB in other subjects, they were arguably not actually proficient in how to use the device. If they were, a translation of the interactive uses into the social studies would have been observed or described by the teachers.

The volume of ready-made materials for other subjects, mathematics in particular, provided the teachers with an opportunity to weed out activities that did not fit their instructional approach, instead of having to create them from scratch. Indeed, in none of the interviews did the teachers describe a lesson in which they created IWB mathematics lessons; rather, they both described selecting from the available resources. This finding suggests that Ms. Adams and Ms. Brown did not actually possess a level of efficacy to create with the technology, but they had sufficient comfort with it to identify activities that actively engaged their students in learner-centered lessons.

Both teachers expressed displeasure with the lack of social studies materials available through the SMART Exchange that were appropriate and engaging. The materials available for fifth-grade social studies were largely limited to drag-and-drop or hide-and-reveal lessons, which are tools typical of a teacher-centered approach to instruction. These teacher felt that due to the high poverty level in the school, many of the students had few opportunities to experience the world. Ms. Adams and Ms. Brown sought to provide these experiences in the classroom. Although they used direct instruction and other didactic approaches to instruction, when appropriate for the lesson goals, they preferred student-centered learning experiences.

The discrepancy between the available ready-made materials and what these teachers knew to be an effective way to teach their student population suggests a disconnect between the IWB tools and the teachers' preferred way of teaching social studies. Through subject-specific professional development and subsequent use of interactive lessons, the teachers felt confident in their ability to use, but not create with, the IWB in mathematics. The volume of readily available IWB lessons in mathematics, which the teachers felt were truly interactive, enabled them to spend their time finding the best lesson for their instructional goals instead of creating materials from scratch.

The perceived dearth of ready-made material in the social studies, especially ones that are interactive and met their instructional goals, meant that these two teachers would have to create materials from scratch. However, they believed they lacked the knowledge and time necessary to create IWB-based student-centered learning experiences. Consequently, these two teachers were not inclined to use the board as much more than a glorified computer monitor, something they were comfortable using in the social studies.

Over the course of this study Ms. Adams and Ms. Brown incorporated both the giving and the prompting approach to instruction when using the IWB in the social studies. They demonstrate a lack of confidence in the best way to utilize tools of this technology to teach social studies in their preferred manner, the making approach, which is both interactive and student centered. They either did not use the device to teach social studies, as indicated by the fact that 71.5% of all scans did not involve the IWB or they used it as a projector.

Their IWB instructional practice was teacher centered. However, their venture into prompting, as seen in the use of the IWB for image analysis, indicates that they attempted to enact more student-focused instruction. Yet, their lack of efficacy with the device stymied their ability to use the IWB in a truly student-centered manner. For these two teachers, the disconnect between their pedagogical approach and their understanding of how the device could be used in the social studies, led them to largely abandon the IWB as an instructional tool. When they did use the device, they did so in a manner that could have been accomplished with other, less expensive, technology.

Implications

Mason et al. (2000) suggested five guidelines for using technology to prepare social studies teachers.

1. Technology should enhance the learning experience, extending it beyond what can be achieved without it.
2. Technology should be introduced in context. There should be an instructional purpose in the use of technology that extends beyond learning how to use a specific type of technology, rather how can the technology serve as a tool to further an instructional approach.
3. There should be opportunities for students to examine the relationships and influences of science, technology and society.
4. Preservice teachers should be exposed to the construct of digital citizenship, as to develop the knowledge and skills necessary to prepare effective citizens in a technology-rich world.
5. In light of the ever-changing nature of technology, researchers of social studies education must continue to examine and evaluate the opportunities, implementation, and effectiveness of new technologies.

Although the teachers in this study are not reflective of all teachers or preservice teachers, their struggle to utilize the IWB effectively as a tool for teaching social studies is informative. The implications for teacher education and continued teacher preparation are clear. If we, as teacher educators, wish to prepare our students to use IWBs, which are becoming increasingly prevalent in classrooms, then we must model how best to utilize the device to teach social studies effectively. In other words, social studies teacher educators must provide preservice teachers the opportunity to develop TPACK, in this case through the use of IWBs in social studies instruction, which is consistent with the principles outlined by Mason et al. (2000).

I agree with Ms. Adams' and Ms. Brown's statements that the most effective and powerful use of the IWB is through small group activities. In my social studies methods class I provide preservice teachers an opportunity to work with the IWB as a center activity during the lessons pertaining to image analysis and primary sources. My students highlight, magnify, and annotate the image or document and save their collaborative work. Not only are they learning how to utilize image and document analysis as an instructional strategy, they also experience a student-centered approach to using an IWB. They are using the available technology to move beyond what could be done without it, and the IWB is introduced in context. The preservice teachers are afforded the opportunity to experience the technology as an instructional tool appropriate for the social studies in an effort to layer technology onto their developing PCK. In other words, they are developing TPACK.

As evidenced by Ms. Adams and Ms. Brown's apparent comfort with using IWB in mathematics, targeted discipline-specific professional development is effective in helping teachers demonstrate TPACK in mathematics. Although these teachers were not fully comfortable with the interactive tools of the IWB, they reported a level of confidence in their ability to utilize the technology to teach mathematics. The teachers had developed sufficient TPACK to implement an IWB effectively in their existing pedagogical approach to mathematics. However, they were not able to use the IWB in social studies instruction.

Clearly, teachers need professional development opportunities dedicated to the effective use of the interactive features of the IWB in powerful, student-centered, social studies instruction. As suggested by the second guideline outlined by Mason et al. (2000),

technology professional development must be presented in the context of the discipline. Without discipline context, it is difficult to layer the technology onto the teachers' PCK effectively for the social studies.

Explicit conversations need to be held regarding the benefits of using an IWB as a tool for social studies instruction. However, as long as school systems continue to purchase these devices, teacher educators will need to provide opportunities for teachers to develop sufficient efficacy in how best to utilize IWB in the social studies. They need models of how best to utilize this device in powerful, student-centered, social studies instruction.

Limitations

Three limitations in this study should be addressed:

1. The presence of a researcher in the room may have altered the behaviors typical of both the teacher and the students. This limitation was mitigated by my prolonged exposure to the class. My presence became normalized as I visited each class at least once a month for the entirety of each visit's social studies lesson.
2. The research focus on the IWB may have resulted in the teachers feeling pressure to utilize the device in their social studies instruction when they would not normally have done so. This pressure may have had the affect of altering their instructional practice. That pressure could not be mitigated, other than by reassuring the participating teachers that I wanted to observe their regular teaching practice, whether or not they used the IWB.
3. Although I observed both classes multiple times over the course of eight months, I was not in the room for every social studies lesson. Consequently, while I observed a sample of the teachers' instructional practice, I did not see every instance of IWB integration. Multiple lesson observations and data triangulation with the teacher and student interviews helped to mitigate this limitation.

Conclusion

These two teachers were chosen for this study not because they were exemplary users of technology. Rather, they were chosen because they were excellent teachers, who did not shy away from using technology when it was appropriate, who had an IWB in their classroom, and had received some district and school-based professional development on IWB. In other words, Ms. Adams and Ms. Brown were similar to thousands of teachers throughout the nation. Although the results of this case study are not generalizable, they do provide insight into what might be considered the typical teacher's use of the IWB in the social studies.

The findings of this study appear to align with the existing literature on the instructional use of IWBs. When these two teachers utilized the IWB they left their typical student-centered approach to instruction and adopted a teacher-centered approach, which is contrary to identified best practice in the social studies. They appeared to be tied to the front of the classroom and the board. Although the teachers attempted to incorporate the IWB in a manner more consistent with their pedagogical preferences, their lack of efficacy with the device hindered their usage. They most often used the IWB as a glorified projector, minimizing the interactive qualities of the IWB.

SMART boards and other IWBs are becoming increasingly prevalent in schools worldwide. Yet, much is still to be learned about this tool, particularly its use in the social

studies, where research is lacking. Three areas for further investigation emerged from this study. First, a content analysis of the IWB lessons available on the SMART Exchange would be beneficial. Analyzing the social studies lessons available through this online repository would provide insight into how IWB lessons are created and used by teachers utilizing the SMART software and if those lessons are largely teacher centered or student centered.

This study examined the instructional practice of two typical fifth-grade teachers. A study focusing on the instructional practice of a social studies teacher who has both a high level of efficacy with the IWB and is a frequent user would be informative. Would the patterns identified in this study, teacher-centered instruction with the IWB and a largely projection-only use of the IWB, hold true in the classroom of someone who is more fluent in the capabilities of the device? Additionally, student engagement in lessons using the IWB would be more informative in a class in which the board is frequently utilized, thereby removing the possible impact of novelty on student engagement with the device.

Finally, content-specific professional development and teacher preparation rooted in the TPACK construct are apparently essential. These two teachers participated in a content-specific IWB professional development for mathematics, and they subsequently reported feeling effective utilizing the device, in mathematics. Such professional development opportunities will need to occur in the social studies if the IWB is to be utilized as anything more than a glorified projector.

References

Altmann, J. (1974). Observational study of behavior: Sampling methods. *Behaviour, 49*, 227-267.

Beeland, Jr., W. D. (2002). Student engagement, visual learning and technology: Can interactive whiteboards help? *Action Research Exchange, 1.* Retrieved from http://chiron.valdosta.edu/are/Artmanscrpt/vol1no1/beeland_am.pdf

Deaney, R., Chapman, A., & Hennesy, S. (2009). A case-study of one teacher's use of an interactive whiteboard system to support knowledge co-construction in the history classroom. *The Curriculum Journal, 20*, 365-387.

DiGregroio, P & Sobel-Lojeski, K. (2009-2010). The effects of interactive whiteboards (IWBs) on student performance and learning: A literature review. *Journal of Educational Technology Systems, 38*(3), 255-312.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research & Development, 53*(4), 25-39. doi: 10.1007/BF02504683

Friedman, A. (2006). World history teachers' use of digital primary sources: The effect of training. *Theory and Research in Social Education, 34*(1), 124-141.

Glaser, B.G., & Strauss, A.L. (2010). *The discovery of grounded theory: Strategies for qualitative research.* New Brunswick, NJ: Aldine Transaction.

Hammond, T.C., & Manfra, M.M. (2009). Giving, prompting, making: Aligning technology and pedagogy within TPACK for social studies instruction. *Contemporary*

Issues in Technology and Teacher Education, 9(2), 160-185. Retrieved from http://www.citejournal.org/vol9/iss2/socialstudies/article1.cfm

Higgins, S., Beauchamp, G., & Miller, D. (2007). Reviewing the literature on interactive whiteboards. *Learning, Media and Technology, 32*(3), 213-225.

Hoose, P. (2001). *We were there, too! Young people in US. History*. New York, NY: Farrar Straus Giroux.

Jacobsen, D.A., Eggen, P., & Kauchak, D. (2009). *Methods for teaching: Promoting student learning in K-12 classroom.* New York, NY: Allyn & Bacon.

Kearney, M., & Schuck, S. (2008). Exploring pedagogy with interactive whiteboards in Australian schools. *Australian Educational Computing, 23*(1), 8-13.

Kitchen, S., Finch, S., & Sinclair, R. (2008) *Harnessing technology schools survey 2007.*Retrieved from the British Educational Communications and Technology Agency website: http://dera.ioe.ac.uk/1554/1/becta_2007_htssfindings_report.pdf

Koehler, M. J., & Mishra, P. (2008). Introducing TPCK. In AACTE Committee on Innovation and Technology (Ed.), *Handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3-29). New York, NY: Routledge.

Lee, J.K., Doolittle, P., & Hick, D. (2006). Social studies and history teachers' uses of non-digital and digital historical resources. *Social Studies Research and Practice, 1*(3), 291-311.

Lenhart, A. (2015). *Teens, social media & technology overview 2015* (Research report). Retrieved from the Pew Research Center website: http://www. pewinternet.org/2015/04/09/teens-social-media-technology-2015/

Lenhart, A., Ling, R., Campbell, S., & Purcell, K. (2010). *Chapter four: How parents and schools regulate teens' mobile phones* (Research report). Retrieved from the Pew Research Center website: http://www.pewinternet.org/2010/04/20/chapter-four-how-parents-and-schools-regulate-teens-mobile-phones/

Manfra, M. M., & Hammond, T. C. (2008). Teachers' instructional choices with student-created digital documentaries: Case studies. *Journal of Research on Technology in Education, 41*, 223-245.

Martorella, P.H. (1997). Technology and the social studies – or: Which way to the sleeping giant? *Theory and Research in Social Education, 25*(4), 511-514.

Marzano, R. J. (2009). Teaching with interactive whiteboards. *Educational Leadership, 67*(3), 80-82.

Mason, C., Berson, M, Diem, R., Hicks, D., Lee, J., & Dralle, T. (2000). Guidelines for using technology to prepare social studies teachers. *Contemporary issues in technology and teacher education, 1*(1), 107-116. Retrieved from http://www.citejournal.org/vol1/iss1/currentissues/socialstudies/article1.htm

Mercer, N., Hennessy, S., & Warwick, P. (2010). Using interactive whiteboards to orchestrate classroom dialogue. *Technology, Pedagogy and Education, 19*(2), 195-209.

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco, CA: Jossey-Bass Publishers.

Mishra, P., & Koehler, M.J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017-1054.

Mohon, E. H. (2008). SMART moves? A case study of one teacher's pedagogical change through use of the interactive whiteboard. *Learning, Media and Technology, 33*(4), 301-312.

National Council for the Social Studies. (2008). A vision of powerful teaching and learning in the social studies: Building social understanding and civic efficacy [Position statement]. Retrieved from http://www.socialstudies.org/positions/powerful

Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology, 8*, 375-387.

Quillen, I. (2012, February 8). Battle for white-board market supremacy heats up. *Education Week Digital Directions*. Retrieved from http://www.edweek.org/dd/articles/2012/02/08/02whiteboard.h05.html

Scholastic, Inc. (2013). The Underground Railroad: Escape from slavery [website]. Retrieved from http://teacher.scholastic.com/activities/bhistory/underground_railroad/index.htm

Sheffield, C.C. (2011). Navigating access and maintaining established practice: Social studies teachers' technology integration at three Florida middle schools. *Contemporary Issues in Technology and Teacher Education*, *11*(3). Retrieved from http://www.citejournal.org/vol11/iss3/socialstudies/article1.cfm

Sheffield, C. C., & Swan, S. B. (2012). Digital reenactments: Using green screen technology to recreate the past. *Social Education*, *76*(2), 92-95.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi: 10.3102/0013189X015002004

SMART Technologies. (2006). Interactive whiteboards and learning: Improving student learning outcomes and streaming lesson planning. Retrieved from http://www.sharpsav.com/wp-content/uploads/2013/08/Int_Whiteboard_Research_Whitepaper.pdf

SMART Technologies. (2013). SMART quick facts and stats – SMART Technologies. Retrieved from http://smarttech.com/About+SMART/About+SMART/Newsroom/Quick+facts+and+stats

Somyürek, S., Atasoy, B., & Özdemir, S. (2009). Board's IQ: what makes a board smart? *Computers in Education, 53*, 368-374.

Swan, K.O., Hofer, M., & Levstik, L.S. (2007). And...action! Students collaborating in the Digital Directors Guild. *Social Studies and the Young Learner, 19*(4), 17-20.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches.* Thousand Oaks, CA: SAGE Publications.

Teacher's Curriculum Institute. (2010). *Bringing learning alive: Methods to transform middleand high school social studies instruction.* Palo Alto, CA: Teacher's Curriculum Institute.

Teddle, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences.* Thousand Oaks, CA: SAGE Publications.

Türel, Y. K., & Johnson, T. E. (2012). Teachers' belief and use of interactive whiteboards for teaching and learning. *Educational Technology & Society, 15*(1), 381-394.

U.S. Department of Education. (2011). Search for public schools. Retrieved from the Institute of Education Sciences website: http://nces.ed.gov/ccd/schoolsearch

VanFossen, P.J. & Waterson, R. (2008). It's just easier to do what you did before... An update on Internet use in secondary social studies classroom in Indiana. *Theory and Research in Social Education, 36*(2), 124-152.

Whitworth, S., & Berson, M.J. (2003). Computer technology in the social studies: An examination of the effectiveness literature (1996-2001). *Contemporary Issues in Technology and Teacher Education, 2*(4), 472-509. Retrieved from http://www.citejournal.org/vol2/iss4/socialstudies/article1.cfm

The World Bank. (2013). GDP ranking. Retrieved from http://data.worldbank.org/data-catalog/GDP-ranking-table

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Appendix A
Individual Interview Protocol Questions

- How long have you been teaching?
- What grade levels have you taught? Where?
- What is your educational background?
- Is teaching your first career? If not, what other types of employment have you had?
- When did you complete your education coursework?
- What type of technology was included in your teacher preparation, if any?
- How much technology-related professional development have you had?
- How much, if any, training have you had?
- How would you describe your teaching philosophy?
- What type of environment do you think is best for student learning?
- When you hear the term higher-order thinking, what do you envision?
- Do you view the inclusion of technology as essential or an elective component in student education? Please explain.
- How do you envision technology integration? Is this vision a reality? Please explain.
- With regards to technology in the classroom, what do you feel most confident doing? What do you feel least confident? Has your confidence levels influenced your technology integration? How?
- What barriers do you encounter when trying to integrate technology?
    - Probing questions related to: materials, management, support, and skill
- Other than the SMART board, how do you include technology in your social studies class?
- How have you used the SMART board in your classroom (both in the social studies and in other disciplines.)
- How have the students responded to the use of the SMART board?
    - Are there responses different than in the lessons that do not include the SMART board?
- What do you see as the benefits to using a SMART board in your teaching?
- What do you see as the issues with using a SMART board in your teaching?
- How would you summarize your reaction to teaching social studies with the SMART board?

Appendix B
Focus Group Protocol Questions

Thinking back over this past year....

- In what ways have your teachers used the SMART board in their teaching? (any subject)
- What did you think about how the SMART board was used?
- Do you think you paid more attention to the class lesson if the teacher used the SMART board? Why or why not?
- Do you think that you learned more when you teacher used the SMART board? Can you provide me with an example?

Now thinking about your social studies classes...

- What were your favorite units in social studies this year? Why or why not?
- How did you teacher use the SMART board when she taught social studies?
- Did it help you learn social studies more than when it wasn't used? Why do you think this?
- Do you think you paid more attention to the lesson if the SMART board was used in the social studies lessons? Why or why not?
- Who used the SMART board more during the school year, you or your teacher? Why?

Appendix C
Themes and Codes in Qualitative Analysis

Theme 1: Student Engagement

- novelty factor
- kinesthetic/touch

Theme 2: Teaching Behaviors

- pedagogical beliefs
- teacher-centered learning
- student-centered learning
- IWB as projector only
- IWB use more than projector

Theme 3: Barriers to Use

- availability of social studies materials
- teacher efficacy with IWB
- management
- including all students

Ms. Adam's Class

Observation	Lesson Overview	Total Scans	Type	Number of Scans
1	**Topic:** Explorers **Activity:** Students interviewed their classmates who were "expert" on pre-assigned explorer.	23		
			Scan with IWB	1
			projection-only	1
			interactive use	0
			Scan without IWB	22
			teacher-centered	5
			student-centered	17
2	**Topic:** Jamestown **Activity:** Image analysis of two National Geographic images comparing before and after European settlement; History frame using text; Read aloud of a young boy from Jamestown	29		
			Scan with IWB	10
			projection-only	10
			interactive use	0
			Scan without IWB	19
			teacher-centered	6
			student-centered	13
3	**Topic:** Colonies **Activity:** Student groups creating a billboard to attract new residents to their assigned colony.	8		
			Scan with IWB	0
			projection-only	0
			interactive use	0
			Scan without IWB	8
			teacher-centered	1
			student-centered	7
4	**Topic:** Colonial Williamsburg **Activity:** Student groups visit six learning stations exploring religion, education, industry, family life and more in Williamsburg.	20		
			Scan with IWB	0
			projection-only	0
			interactive use	0
			Scan without IWB	20
			teacher-centered	5
			student-centered	15

5	**Topic:** Preamble of the Constitution	19			
			Scan with IWB		10
	Activity: Watched Preamble video; vocabulary overview; Jigsaw Preamble for student groups to create posters portraying assigned part.			projection-only	2
				interactive use	8
			Scan without IWB		9
				teacher-centered	6
				student-centered	3
6	**Topic:** Intro to Westward Expansion	17			
			Scan with IWB		4
	Activity: Image analysis of projected painting; Predicting what life was like for settlers; Read and discuss chapter introduction			projection-only	4
				interactive use	0
			Scan without IWB		13
				teacher-centered	10
				student-centered	4
7	**Topic:** Civil Rights Movement	19			
			Scan with IWB		9
	Activity: SmartNotebook vocabulary lesson; timeline of MLK's life; Venn diagram comparing MLK and Gandhi; Reading informational text on the Children's March.			projection-only	0
				interactive use	9
			Scan without IWB		10
				teacher-centered	10
				student-centered	0
8	**Topic:** Great Depression	17			
			Scan with IWB		10
	Activity: Watch review video of the 1920; Read introduction to the Great Depression; Class created graphic organizer of the causes of the Depression; analysis of Depression-era songs.			projection-only	7
				interactive use	3
			Scan without IWB		7
				teacher-centered	7
				student-centered	0

Ms. Brown's Class

Observation	Lesson Overview	Total Scans	Type	Number of Scans
1	**Topic:** US regions & Native Americans **Activity:** Teacher presentation on Inuit; Student presentation of their projects of Native Americans from assigned region.	18		
			Scan with IWB	5
			projection-only	5
			interactive use	0
			Scan without IWB	13
			teacher-centered	0
			student-centered	13
2	**Topic:** Explorers **Activity:** Watch video on IWB; student groups created advantages and disadvantages of exploration for explorers and Native Americans	26		
			Scan with IWB	6
			projection-only	6
			interactive use	0
			Scan without IWB	20
			teacher-centered	6
			student-centered	14
3	**Topic:** Explorers **Activity:** Students continuing work on a project to research and categorize explorers; Deal-or-No Deal review game on IWB	31		
			Scan with IWB	15
			projection-only	15
			interactive use	0
			Scan without IWB	16
			teacher-centered	2
			student-centered	14
4	**Topic:** Middle Passage **Activity:** Class discussion of treatment of slaves on the Middle Passage; projected video; small group shared reading of an excerpt written by Equiano.	22		
			Scan with IWB	4
			projection-only	4
			interactive use	0
			Scan without IWB	18
			teacher-centered	10
			student-centered	8

5	**Topic:** Loyalist v. Patriots **Activity:** Teacher led discussion and grouping of individuals into categories	20		
			Scan with IWB	2
			projection-only	2
			interactive use	0
			Scan without IWB	18
			teacher-centered	18
			student-centered	0
6	**Topic:** Colonial America review **Activity:** Jeopardy review game on the IWB	15		
			Scan with IWB	14
			projection-only	0
			interactive use	14
			Scan without IWB	1
			teacher-centered	1
			student-centered	0
7	**Topic:** Bill of Rights **Activity:** Shared reading about the Bill of Rights with a graphic organizer for note taking.	20		
			Scan with IWB	0
			projection-only	0
			interactive use	0
			Scan without IWB	20
			teacher-centered	20
			student-centered	0
8	**Topic:** Westward Expansion **Activity:** Kinesthetic simulation of the pushing west of Native Americans; Image analysis; Shared reading; Map creation	15		
			Scan with IWB	1
			projection-only	1
			interactive use	0
			Scan without IWB	14
			teacher-centered	14
			student-centered	0