2015

An Investigation of Teacher Librarians' Use of Interactive Whiteboard Technology for Literacy Instruction

Judith Carroll Stanton
Walden University

Walden University

COLLEGE OF EDUCATION

This is to certify that the doctoral study by

Judith Stanton

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Jerita Whaley, Committee Chairperson, Education Faculty
Dr. Mohamed Tazari, Committee Member, Education Faculty
Dr. Karen Hunt, University Reviewer, Education Faculty

Chief Academic Officer

Eric Riedel, Ph.D.

Walden University
2015

Abstract

An Investigation of Teacher Librarians' Use of Interactive Whiteboard Technology for Literacy Instruction

by

Judith Carroll Stanton

MA, Georgia State University, 1998

BA, Georgia State University, 1986

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

February 2015

Abstract

Although school systems have made investments in technology with the intention of raising student scores on state and national tests, improvements in student achievement have not always followed. The purpose of this study was to investigate teacher librarians' use of interactive whiteboards to improve student literacy. This qualitative case study was guided by the theory of social constructivism, wherein individuals learn through interaction with peers and knowledgeable others. The research questions were focused on how teacher librarians integrated multi-literacies and technological skills into pedagogical goals. Data were collected from a 4-member focus group interview, a questionnaire delivered to a subset of 3 teacher librarians, and public documents of the school system. All data were color-coded and analyzed for emergent common themes. The findings indicated that although the teacher librarians used interactive whiteboard technology to teach multiple literacies and technological skills to students and fellow teachers, 2 of the 4 participants did not use all of the interactive whiteboard tools. Based upon the findings, a professional development project was designed to improve educators' technological and multi-literacies skills in the school system. Recommendations include creating a repository of technology rich lesson plans, and expanding collaboration among educators. Increasing multi-literacies and technological skills may lead to positive social change through the enhancement of students' literacy and technology skills at school and for future employment.

An Investigation of Teacher Librarians' Use of Interactive Whiteboard Technology for Literacy Instruction

by

Judith Carroll Stanton

MA, Georgia State University, 1998

BA, Georgia State University, 1986

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

February 2015

Dedication

This is dedicated to my wonderful husband, George, who supported my endeavors every step of the way. I truly could not have done it without you, my dearest love and very best friend.

Geoff and Suzi, thank you for all that you have done these past five years to encourage and assist me. Your love and encouragement from the beginning of this journey has made all the difference for me. I love you both.

Acknowledgments

This case study would not have been possible without the help of so many people. Dr. Jorgensen, thank you for your kindness, understanding, support, and willingness to go the extra mile. I still remember the time that you asked me, “Other than moving in with you and cooking your meals, what can I do to help?” I laughed and laughed, but that comment carried me through to completion, my dear friend.

Dr. Tazari, I particularly appreciated your help with the references, as not every methodologist appreciates such a wide span of dates or locales for research. Dr. Hunt, thank you for your insightful comments and recommendations.

Dr. Whaley, thank you for stepping in when Dr. Jorgensen retired. Your suggestions and advice have been absolutely invaluable in pushing through this case study to the finish line. I cannot thank you enough for all that you have done.

Beth, Nancy, Deborah, Sherri, Debra, and JB, your loving support helped in so very many ways. Nell, Peg, and Georgina, thank you for your belief in my reaching the end of this journey.

Table of Contents

Section 1: The Problem

Introduction

Researchers have indicated that the use of interactive whiteboards facilitates increased student motivation and understanding (Deaney, Chapman, & Hennessy, 2009; Kennewell, Tanner, Jones, & Beauchamp, 2008). For teachers with effective pedagogical and technical skills, the use of an interactive whiteboard can be used to enhance the "learning benefits of interactive websites and ICT" (Murcia & Sheffield, 2010, p. 418) for small or large group instruction. An interactive whiteboard consists of a computer and digital projector attached to a whiteboard. The projector displays digital images from the computer onto the whiteboard, such as video clips, websites, and mathematical graphs (Marzano, 2009, p. 80). Whiteboard applications might include images or answers that can be dragged and dropped by touch or with a specially designed pen, or via mobile input devices, such as slates or tablets (Deaney et al., 2009; Marzano, 2009). Researchers have indicated that this interactivity appealed to kinesthetic, aural, and visual learners (McQuillan, Northcote, & Beamish, 2012; Schwartz & Thormann, 2010), as well as to students with learning and perceptual or emotional disabilities (Allsopp, Colucci, Doone, Perez, Bryant, & Holfeld, 2012; Canter, Voytecki, Zambone, & Jones, 2011). Vygotsky (1978) and Wink and Putney (2002) described how children learned through peer collaboration and with their teachers in their construction of knowledge. Mercer, Hennessey, and Warwick (2010) found interactive whiteboards afforded this social constructivist approach to learning.

Multiple literacies, also called multi-literacies, have been defined as the ability to understand the meaning in online, video, audio, digital, and print formats (Jewitt, Moss, & Cardini, 2007; McPherson, 2004). Kress (2003) argued that literacy cannot be separated or defined "in isolation from a vast array of social, technological and economic factors" (p. 1). Using interactive whiteboard technology as a tool to engage students might increase their multi-literacies skills, including information, media, digital, and print literacy.

The teacher librarians and school administrators in a school district in the United States noticed a decrease in engagement in the classroom, and in motivation for learning, as well as in the multi-literacies skills of their students, particularly in their print, media, and information literacy. According to the Department of Education's website, 8% of all fourth graders in this school system did not pass the reading section of the state-mandated test for the 2007-2008 school year. Additionally, 7% of all fourth and eighth grade students failed the language arts portion of the test the same school year. Of greater concern, the Department of Education's website also indicated that 15% if one subgroup of fourth grade students had failed the reading test, while 13% had failed the language arts section. An analysis of the Grade 8 report from the Department of Education's website revealed that 15% of the same subgroup had failed the language arts portion of the state-mandated test.

The School Board of the school district studied chose to purchase interactive whiteboards for all schools, including the school library media centers, to enhance literacy instruction for students. For the purpose of this case study, the school system will

be referred as the Laurel Falls School District (pseudonym). Through an exploration of their experiences using interactive whiteboards in library classrooms, I examined the teacher librarians' use of interactive whiteboards as instructional tools to promote student engagement in and motivation for learning and literacy.

Definition of the Problem

Laurel Falls School District noticed a decrease in student engagement in classroom activities and in multiple literacies. During the 2007-2008 and the 2008-2009 school years, some students in the third and eighth grades showed significant drops in their reading and language arts scores, according the information from the Department of Education website. The school system purchased interactive whiteboards for all eight schools, as researchers found that interactive whiteboards and other educational technologies tended to encourage student learning and participation in the classroom (Marzano, 2009; Morgan, 2008).

Palfrey and Gasser (2008), Ohler (2009), Tapscott (2009), and Shepherd (2010) argued that students in the digital age have grown up using a variety of technologies. Shepherd (2010) noted that this increase in new media created "new means for expression, persuasion, and interaction with others. It has also brought new expectations for learners and those responsible for educating them… embracing a broader vision of what it means to write or be literate" (pp. 44-45). Teaching these literacies might be aided by the use of interactive whiteboards, as students tended to engage more with lessons when working with technology (Deaney et al, 2009). They could build on skills learned

through computer and Internet use at home and away from school (Hennessy, Deaney, Ruthven, & Winterbottom, 2007; Kennewell, et al., 2008).

Rationale

Evidence of the Problem at the Local Level

In this study, I based the rationale on the concern of the school board and the educational leadership team of teacher librarians, teachers, and administrators about the decreased rates of multiple literacies in some of their students, as reflected in their scores in reading and language arts on the state-mandated test. Questions on information and media literacy were included in the reading and language arts portions of the test. The Department of Education website provided information of the test scores of students in the Laurel Falls School District. While 8% of all fourth graders did not pass the reading section of the state-mandated test for the 2007-2008 school year, 7% of all fourth and eighth grade students failed the language arts portion of the test the same school year. Of greater concern, the analysis by the Department of Education revealed that 15% of one subgroup of fourth grade students had failed the reading test, while 14% had failed the language arts section.

The Department of Education report on Grade 8 students indicated that 15% of the same subgroup had failed the language arts portion of the state-mandated test. This caused concern among the administrators and teachers of the Laurel Falls School District, as students with an insufficient grasp of academic language, as evidenced in their language arts and reading scores, often struggled with other subjects as well (Bylund, 2011; Roessingh, 2006; Snow, 2010; Webb, 2010).

Evidence of the Problem from the Professional Literature

The National Report Card from the United States Department of Education listed that, in 2007, 45% of this subgroup of eighth graders performed below the Basic level in reading, while 54% of the subgroup of fourth graders scored below the Basic level in reading. Some of these students might opt to drop out of school, as they failed to learn the cognitive academic language they needed to succeed (Snow, 2010). Duncan (2010), the United States Secretary of Education, emphasized that one in four students in the United States either failed to graduate on time or dropped out of school, creating an overwhelming figure of almost one million students who were "…basically condemned to poverty and social failure" (para. 22). Researchers found that individuals who dropped out of high school tended to have an annual income over 50% lower than those with a high school diploma or a General Educational Development (GED) certificate (e.g., Chapman, Laird, Ifil, & KewalRamani, 2011). Effective literacy instruction may help students to acquire the cognitive academic language needed for success.

Print and technological demands have continued to grow and expand at school and the workplace. The need for competency in the multi-literacies of print, digital, information, and media literacy increased significantly in the last two decades (Jewitt, 2008; Palfrey & Gasser, 2008; Tapscott, 2009). One of the Common Core State Standards (CCSS) emphasized the ability of students to read, interpret, evaluate, and synthesize data using both print and nonprint formats (Common Core State Standards Initiative, 2010, p. 4). Unfortunately, not all students have had the training needed for the demands of our 21st century society.

Clemmitt (2008) contended that literacy entailed the ability to communicate through blogs, emails, and instant messages, as well as being able to synthesize information from online texts and videos (para. 1). Kress (2003) noted that while written communication once used primarily paper and ink, it now uses digital media. The "medium of the screen" has begun to dominate over the "medium of the book" (p. 1). Jewitt (2008) argued that educators should use available technological resources as a starting point, based on students' own literacy practices (para. 15). Researchers insisted that the use of technology in classroom pedagogy could aid in teaching literacy to students (Wood & Ashfield, 2008; Tapscott, 2009).

Teacher librarians promoted literacy in students through teaching multiple literacies including information and media literacy skills for locating and evaluating information from databases or from the Internet (Bray & Hollandsworth, 2011; Hamilton, 2011; Lamb & Johnson, 2011; McPherson, 2004). Using technology skills such as interactive whiteboards and other forms of information and communication technologies (ICT), they promoted print and digital literacy through storytelling, and through both print and digital books (Asselin & Doiron, 2008; Bell, 2001; Kress, 2003). Stroup, deWolf, and Lincoln (2010) described the teacher librarians of a Midwest school system who jokingly referred to their roles as being "the CIOs – Chief Information Officers" of their schools (p.75) for students and teachers alike. This ability to act as the CIOs of the school has been mandatory with the increasing technology demands of the 21st century (Jurkowski, 2006; Stroup et al., 2010).

Students of the 21st century have been termed *digital natives*, the *net generation*, and *Generation Y* (Gee, 2007; Palfrey & Gasser, 2008). The last 40 years have been marked by significant advances in technology. Children born during this period have exhibited commonalities, such as having a greater ease with using computers, cellphones, and other types of digital communication equipment; and preferring to spend more time online with friends than in person (Cervetti, Damico, & Pearson, 2006; Gee, 2007; Palfrey & Gasser, 2008). Killian (2009), Prensky (2001) and Tapscott (2009) listed changes in the brains of the Net Generation, including the ability to process visual information more rapidly; improved hand-eye coordination, especially among the gamers (i.e., ones who played video games often); and an enhanced ability to learn from visual images, instead of written texts.

Prensky (2001) contended that these students "crave interactivity" and that most schools were ill-equipped to handle their learning styles (pp. 4-5). Asselin and Doiron (2008) described these students as "action-oriented problem solvers [who] see technology as their primary tool; they…herald creative thinking, empowerment, and problem solving as key qualities in the new global economies; [viewing] themselves as competent pioneers in their personal and shared futures" (p. 2). Improved use of such technologies as interactive whiteboards by educators might help these students to read more effectively across the broad band of literacies available in the workplace, the school, and in the home.

Winzenried, Dalgarno, and Tinkler (2010) found interactive whiteboards "improved the motivation and engagement for a difficult to engage class, provided access

to a wide range of new types of teaching resources, and most importantly resulted in noticeable improvements in academic achievement" (p. 540). Learning occurred during verbal interaction of the pupils and their teachers, as well as during students' physical interactions with the interactive whiteboards throughout the lessons (Cuthell, as cited in O'Murchu & Sorensen, 2006). Researchers found increased participation in learning activities by students in classrooms where interactive whiteboards were employed by effective teachers (Morgan, 2008; Moss, Jewitt, Levaãiç, Cardini, & Castle, 2007; Schwartz & Thormann, 2010). The use of interactive whiteboard technology in the school pedagogy may increase students' participation in classroom activities, and their levels of achievement.

Definitions

Affordances - The software of interactive whiteboards which enables interaction is a British term and used in this case study to describe the tools of the software (Maher, 2011).

Digital literacy **–** The term refers to the ability to use information and communication skills, such as using computers, cell phones, and presentation technology (Cope & Kalantzis, 2009).

Digital native – A term was coined by Prensky to describe people who grew up surrounded by digital media, such as cell phones, computers, and video games. He contended that the educational systems of the United States were ill-prepared to teach these students (Prensky, 2001).

Flipchart **–**The software of interactive whiteboards enables instruction through the creation of interactive lesson plans (Mercer, Hennessey, & Warwick, 2010).

Generation Y – Individuals who were born between 1982 and 1991 are also known as Millenials or the Net Generation. They have used information and communication technologies from a young age, often beginning in the home (Palfrey & Gasser, 2008).

Information and Communication Technology (ICT)- Silverstone created the term to describe "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." (Blurton, 1996, para.1)

Information literacy **–** This is the term used to describe the ability to "identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information" (University of Idaho Library, 2001, para. 1).

Interactive whiteboard **–** An electronic whiteboard is attached to a digital projector and a computer and controlled by touch or by the use of an interactive pen (Smith, Higgins, Wall, & Miller, 2005, p. 91).

Media literacy **–** The ability to "access, analyze, evaluate, create and participate …in a variety of forms – from print to video to the Internet" (Center for Media Literacy, 2001, para. 3) has now become part of the literacy curriculum in the United States, Canada, and most European countries.

Multimodality **–**This term refers to the combining of videos, podcasts, animations, still and moving images, music, and webpages to make meaning (Tully, 2008, para. 2).

Multi-literacies **–** The New London Group developed this term to describe the variety of communication mediums available. These include information and communication technologies, and the culturally and linguistically diverse forms available on the Internet, such as websites, videos, animations, and e-books (Shattuck, 2009).

Net generation – A term was developed by D. Oblinger and J. Oblinger in 2005 to describe those individuals born between 1982 and 1991, who began using computers at young ages (Oblinger, D. & Oblinger, J., 2005).

Professional development – The training provided to educators can be defined as a "comprehensive, sustained, intensive, and collaborative approach to improving teachers' and principals' effectiveness in raising student achievement" (Learning Forward, 2011, p. i).

Promethean Activboards **–** Interactive electronic whiteboards are produced by Promethean, Inc. located in Lancashire, England (Promethean, 2014).

SMART boards **–** Interactive whiteboards are manufactured by SMART Technologies in the United States (Smart Technologies, 2005).

Significance

There is little research concerning the use of interactive whiteboards by teacher librarians in a school library media center setting. A number of researchers from Australia, India, Great Britain, Estonia, Mauritius, and Canada described the use of interactive whiteboards in classrooms or computer labs (Chen & Tsai, 2013; Hill, 2014; Kumar Bahadur & Oogarah, 2013; Mullamaa, 2010; Sharma, 2012; Terreni, 2010; Tay, S. Lim, C. Lim, & Koh, 2012). To date, only one study (Olsen, 2008), at the master's

level, examined their use by teacher librarians in school library media centers. The purpose of this study was to examine the daily experiences of teacher librarians using interactive whiteboards to promote literacy through student motivation and engagement in learning, and the effects of their perceptions of interactive whiteboards on the promotion of multi-literacies in their students and their fellow educators. Asselin and Doiron (2008) described the school library as the focal point for the interaction of the literacies used in the home and the literacies taught at school. In this case study, I explored how and in what ways the teacher librarians as instructional leaders in the school system integrated interactive whiteboards into their instructional practice to enhance student learning.

The teacher librarians of the Laurel Falls School District, like the majority of teacher librarians, served as technical resources for students, teachers, and other educators within their schools and their school system (Brewer & Milam, 2006). Internationally, interactive whiteboards have been used successfully in a wide variety of classes, from library classrooms and special needs classes to physical education classes (Snow, 2010). Through training and collaboration with teachers, teacher librarians as members of school leadership teams have taught enhanced use of interactive whiteboards and other technologies to encourage student motivation in learning.

A number of schools in the United States, Taiwan, Great Britain, Australia, New Zealand, Turkey, and South Africa promoted multiple literacies through effective teaching with interactive whiteboards (Beeland, 2002; Hodge & Anderson, 2007; Moss, et al., 2007; Morgan, 2008). The American Association of School Librarians (AASL;

2008) emphasized the roles of librarians in teaching students how to analyze, synthesize, and evaluate information within a technological multimedia framework (AASL, 2008, section 2.1). Selfe (2004) suggested, "if we continue to define literacy in ways that ignore or exclude new media texts, we not only abdicate a professional responsibility…but we also run the risk of our curriculum holding declining relevance for our students" (p. 55). Martin (2008) and Palfrey and Gasser (2008) emphasized the necessity of teaching information and digital literacies to students, as these literacies might profoundly enrich and transform human capacity for thinking (Bélisle, 2006, as cited in Lankshear & Knobel, 2008, p. 55). Teacher librarians promote literacy in students through the use of technology, such as the interactive whiteboard.

Research Questions

The research questions that I examined in this case study were:

Research Question 1: What were the perceptions of the teacher librarians about using the interactive whiteboard to encourage student engagement in library classroom activities and student motivation for learning?

Research Question 2: How and in what ways were they, or were they not, incorporating interactive whiteboards into their multi-literacies curricular goals to teach information and media literacy?

Research Question 3: What did the teacher librarians perceive to be their greatest benefits and challenges in teaching with an interactive whiteboard?

To date, no one at the doctoral level has addressed the use of interactive whiteboards by teacher librarians. Some research has been conducted in the teaching of

multiple literacies by teacher librarians. The majority of the research on interactive whiteboard use has referred to the work of classroom teachers. Although the AASL (2010) strongly advocated the teaching of information literacy, as well as print and digital literacy, in the library classroom, only in recent years has the term media literacy begun to be addressed in the recommendations as well (AASL, 2010). Using technology, teacher librarians teach these multiple literacies to students.

As the school system being studied had observed a decrease in reading scores in some students on the state mandated tests, the teacher librarians were among the educators who had interactive whiteboards installed in their classrooms. In this study, I explored how and in what ways the teacher librarians did, or did not use the interactive whiteboards installed in the library classroom. A case study approach enabled a closer examination of these teacher librarians as to their perceptions of the effect of interactive whiteboards on student motivation and engagement in learning.

Review of the Literature

The theoretical foundation of this study focused on the social constructivist aspects of teaching with interactive whiteboards, as used by teacher librarians in school library classroom settings. An epistemological concept, constructivism provided an understanding of how children and adults construct and interpret knowledge through social interactions with others (Cox, 2005; Deaney et al., 2009; Warwick & Kershner, 2008). Haldane (2007), Geer and Sweeney (2012), and Walker (2013) related how individuals learn through shared experiences and reflection. The theory of constructivism

drew upon the work of Dewey, Piaget, Bruner, Vygotsky, and Knowles (Conrad & Donaldson, 2011; Walker, 2013).

I conducted research for this case study through the Walden University Library utilizing the following databases: Academic Search Complete, EBSCO, Education Research Complete, Education: a Sage full-text database, Pro-Quest Central, and Thoreau. Additional books were obtained through a local university library. The Boolean search terms that I used included: *academic achievement, academic language, ACTIVboards, ActivBoards, Bruner, collaboration, constructivism, constructivist, electronic whiteboards, electronic white boards, interactive white boards, interactive whiteboards, Knowles, librarians, libraries, library media specialists, media centers, media specialists, multi-literacies, multiple literacies, professional development, Promethean ACTIVboards, school librarians, school libraries, school library media centers, Smartboards, SMART Boards, social constructivism, social constructivist, teacher librarians,* and *Vygotsky*.

Beauchamp and Parkinson (2005), Smith et al. (2005), Gatlin (2007), Sheppard (2010) and Gadbois and Haverstock (2012) found a number of benefits to the use of interactive whiteboards, including efficiency, interactivity, multimodal presentation, and versatility. In a number of studies, particularly from Great Britain, Australia, New Zealand, the United States, Turkey, Jordan, Saudi Arabia, and Taiwan, researchers demonstrated the effectiveness of interactive whiteboards as technological tools when used by teachers in classroom settings (Beauchamp & Kennewell, 2010; Chen & Tsai, 2013; Hwang, Wu, & Kuo, 2013; Isman, Abanmy, Hussein, & Al Saadany, 2012;

Jwaifell & Gasaymeh, 2013; Türel & Johnson, 2012; Marzano, 2009; Warwick, Mercer, Kershner, & Staarman, 2010).

Beeland (2002), Liles (2005), Rivers (2009), and Terreni (2010) found students were more motivated and engaged in learning, as well as more collaborative with classmates and teachers when interactive whiteboards were used for instruction. This was particularly the case when the interactive whiteboard technology was correctly utilized by effective teachers (Gatlin, 2007; Gillen et al., 2007; Kennewell & Beauchamp, 2007).

Wall, Higgins, and Smith (2005), Gillen, Staarman, Littleton, Mercer, and Twinner (2007), Kennewell and Beauchamp (2007), and Rivers (2009) found the interactive whiteboard enabled teachers to teach literacy more easily to students through use of its varied modalities, including "colour, image, sound, [and] spatial and kinesthetic resources" (Jewitt et al., 2007, p. 304). As Dixon-Krauss (1996) described it, interactive whiteboard software facilitated "instruction that [was] developmentally slightly ahead of the learner's from a Vygotskyian standpoint, [thus becoming] a tool for the learner" (pp.186-187). With effective use, the interactive whiteboard might aid in the improvement of student literacy rates.

Deaney et al. (2009) and Essig (2011) argued that interactive whiteboards allowed for a constructivist approach with scaffolded instruction. Crippen and Archambault (2012) defined scaffolded instruction as a step by step procedure whereby the teacher guides students through the instruction. They asserted that the steps would "serve to reinforce and make explicit the process and products of learning" (Crippen & Archambault, 2012, p. 167). Lipscomb, Swanson, and West (2004), Hennessey et al.

(2007), and Pritchard and Woollard (2009) described *scaffolding* as the facilitation of students' incremental mastery of specific goals by using different approaches. Pritchard and Woollard (2010) recommended that scaffolding should be only temporary, gradually withdrawn as the students began to be able to handle the task at hand (p. 39). Using a constructivist approach by scaffolding instruction enabled students to improve their metacognitive awareness skills (Bay, Bagecci, & Cetin, 2012; Reedy, 2008). In conclusion, the incremental instruction afforded by interactive whiteboard technology aided student learning.

In a study by Cuthell (2010), teachers maintained that students with visual or kinesthetic learning styles found that their individual learning needs were met more effectively with interactive whiteboards. The interactivity of the interactive whiteboards tended to increase the attention span of the students, particularly the youngest students and those thought to have attention deficit disorder (Carter, 2002, p.10). Leach (2010), Simpson and Keen (2010), and Yakubova & Taber-Doughty (2013) found interactive whiteboard technology to be effective for students with Autistic Spectrum Disorder. Xin and Stuman (2011), Carnahan, Williamson, Hollingshead, and Israel (2012), and Whitby, Leininger, and Grillo (2012) found the interactive whiteboard to be advantageous in meeting the learning skills of children with moderate to profound disabilities, as well as deaf students (Carter, 2002; Schweder, Wissisk, & Mounce, 2008). Cooper (as cited by Smart Technologies, 2005) observed that students with some visual impairment found the larger screen enabled them to "see things in the classroom they [had] never seen before"

(para. 5). The use of interactive whiteboards helped teachers to meet a variety of learning needs for students.

The different features of interactive whiteboards, such as the range of presentation modalities, enabled teachers to reinforce understanding of lessons visually (Hodge & Anderson, 2007; Smith et al., 2005). Cope and Kalantzis (2007) argued that with digital media, students "do not all have to be on the same page. At any one time, they [may do] doing what is best for them given what they already know" (p. 78). Deaney et al. (2009), Kennewell and Beauchamp (2007), and Liang, Huang, Tsai (2012) found increased cognitive and verbal interaction as well as cooperation in their students, in large part due to the affordances of the interactive whiteboard. The enhanced engagement of students with their teachers, as well as with each other, gave "practical expression to Vygotsky's premise that what we do together today we can do alone tomorrow" (Haldane, 2007, p.269). Instruction with interactive whiteboards tended to increase attention and cooperation among students.

Gillen et al. (2007), Hennessy et al. (2007), Leach (2010), and Schweder et al. (2008), found that educators enjoyed the ability of the interactive whiteboard to provide student centered activities, including the manipulation of objects on the electronic display. Although the interactive whiteboards were often used one student at a time, slowing the pace of the activity, teachers observed the students continued to maintain high levels of engagement (Hodge & Anderson, 2007; Rivers, 2009), indicating that most of them were "thinking along with the selected student about what the best action would be" (Kennewell & Beauchamp, 2007, p. 234). Hennessey et al. (2007) noted that both

students and teachers believed interactive whiteboards increased student motivation and student learning (p. 288).

Not all researchers found interactive whiteboards to be effective in teaching, motivating, and engaging students (Evans, 2010; Jones, Kervin, & McIntosh, 2011). Manzo (2010) described electronic whiteboards as “fancy, expensive chalkboards, especially when their interactive features are ignored by teachers who don’t know how or refuse to use them” (para. 13). Other researchers argued that educators teaching with interactive whiteboards tended toward a faster pace, offering less time to students for expanded answers or discussions (Gillen, et al., 2007; Kennewell & Beauchamp, 2007). Moreover, Solvie (2004), Smith et al. (2005), and Evans (2010) indicated that traditional modes of instruction without the use of interactive whiteboards could be just as effective as instruction with the use of them.

Zevenbergen and Lerman (2008) argued that although interactive whiteboard technology had considerable potential, much of that potential remained unrealized (p.110). Jones et al. (2011) warned that electronic whiteboards use could “shape the nature of curriculum knowledge under construction in classrooms, as well as to influence notions of literate practice and of learning” (p.57). Kervin and Mantei (2010) stressed the importance of teachers giving their students “a clear rationale and purpose for the integration of technology” (p.80) into the curriculum. Johnson (2011) recommended instruction that focused on the acquisition of cognitive skills, rather than technical ability. Reedy (2008) emphasized:

> If knowledge is presented to students as a *fait accompli* and as a series of objectives to be accomplished, rather than as something constructed or worked out through a demonstrable and reproducible process of reasoning, examining evidence, and use of logic, then the learning experience may inevitably be less rich and less meaningful for students. (p.161)

Swan, Schenker, and Kratcoski (2008, as cited in Luca & Weippl, 2008) found that the test scores of students using an interactive whiteboard almost daily in the classroom were above the mean in both language arts and mathematics. Use of this technology by students, not teachers, increased student achievement (Herrington & Kervin, 2007; Marzano, 2009). With effective instruction by teachers, interactive whiteboards tend to increase student achievement.

A strong correlation was found between professional development and frequent employment of interactive whiteboards in the classroom, especially with regards to training to aid educators in combining the use of the boards with the school pedagogy (Cogill, 2003; European Schoolnet, 2010; Miller & Glover, 2010). Researchers found that within two to three years, teachers began embedding the use of the interactive whiteboard in their lessons, resulting in new or enhanced curricular practices (Lewin, Scrimshaw, Somekh, & Haldane, 2009; Marzano, 2009; Mercer et al., 2010; Mohon, 2008). Thus, professional development aided in teachers' use of interactive whiteboards for instruction.

Branscombe, Castle, Dorsey, Surbeck, and Taylor (2003), Deaney, et al. (2009), and Duncan (2010) recommended incorporating technological tools into the curriculum

to enhance understanding and authenticity of the learning experience. Using an interactive whiteboard, educators could embed a number of different technologies into a lesson, such as a blog, a wiki, a video, a PowerPoint, and present and past interactive whiteboard lessons, for whole group or small group instruction (Deaney et al., 2009; Marzano, 2009). Wood and Ashfield (2008) insisted that by "fusing technology with pedagogy" (p. 95), educators obtained an enhanced understanding of what their students were learning. Embedding technology within pedagogical goals enabled teachers to provide a wider range of instructional materials.

Palfrey and Glasser (2008) argued that, "Digital tools will find their place in schools and libraries…The hard part, during the transition, will be to discern what to preserve about traditional education and what to replace with new, digitally mediated processes and tools" (p. 253). Teacher librarians methodically reviewed and selected technologies to be purchased by their schools (Stroup, et al., 2010), and instructed teachers with the use of the technologies (Asselin & Doiron, 2008; Loertscher & Diggs, 2009; Zmuda & Harada, 2008). In their role of instructional technology leaders, teacher librarians worked collaboratively with teachers to embed these technologies into pedagogical classroom practices

Implications

The findings of this study may be used to promote effective use of interactive whiteboards by teacher librarians and classroom teachers. The successful employment of the technology might promote literacy through increased student motivation for and engagement in learning. Effective use of interactive whiteboards would encourage the

acquisition of multiple literacy skills in students. This, in turn, would prepare students to be informed, literate citizens who contribute to society and to the world.

The results of this study may indicate the need for a stronger role for administrators in the promotion and support of interactive whiteboard technology in the school and an increased need for site-based professional development (Lewin, et al., 2009; Shattuck, 2010). A necessity for a community of practice might exist, wherein educators met to share assessments, lesson plans, and student-centered curricular goals (Earl, as cited in Hawley, 2007). The teacher librarians might indicate a need for a shared database of interactive whiteboard lesson plans and assessments, available to all of the educators in the school system.

Summary

By exploring the perceptions and challenges faced by the teacher librarians, I gathered data on whether the interactive whiteboards contributed to the instructional process when used by effective educators in classroom environments. Several factors could aid or detract from the effective use of interactive whiteboards. Researchers found that administrative support and professional development aided in the acceptance and effective use of interactive whiteboards (Armstrong et al, 2005; Dana & Yendol-Silva, 2003; Glover & Miller, 2010; Hall & Higgins, 2005; Shattuck, 2009). The level of interest educators had towards using interactive whiteboards was another factor that could aid or detract from effective use of technology (Mathews-Aydinl & Elaziz, 2010). Although teacher librarians functioned as technological and instructional leaders in schools (Asselin & Doiron, 2008; Everhart, Mardis, & Johnston, 2010; Johns, 2008;

Stroup et al. 2010), school administrators could be unaware of the work that teacher librarians performed (Zmuda & Harada, 2008). Staff development workshops and collaboration with teachers by the teacher librarians would increase the expertise of the teaching staff (Zmuda & Harada, 2008).

In Section 2, I specify the research methodology that I used and the results of the study concerning the perceptions and experiences of four teacher librarians in the Laurel Falls School District using interactive whiteboards for instruction. In Section 3, I provide a review of the project, integrating the research findings consistent with the case study. The design of the project was determined by the findings and the results of the study as it was conducted. Finally, in Section 4, I explore the results of the study, my reflections and conclusions, and implications for social change.

In this study, I examined how the teacher librarians perceived the teaching and learning potential of interactive whiteboards as tools to increase student motivation and engagement in learning (Beauchamp & Parkinson, 2005; Kennewell & Beauchamp, 2007; Liles, 2005; Marzano, 2009; Rivers, 2009; Smith et al., 2005). A positive social impact of this study may be heightened reading abilities in students, especially in print, digital, information, and media literacies (Asselin & Doiron, 2008). Other implications included increased student engagement in classroom activities and in student motivation for learning, and the recognition of teacher librarians as technological and instructional leaders in schools. At a time when school systems throughout the United States have reduced the number of teacher librarians in their schools, another positive social change may be increased visibility of the role of teacher librarians in the school system (Johns,

2008, pp.30-31) to provide collaborative, instructional leadership for the educational community.

Section 2: The Methodology

Introduction

The school board of the Laurel Falls School District, located in the United States, purchased Promethean ActivBoards interactive whiteboards for use in the library media centers and classrooms of eight schools. Their aim was to help alleviate a noticed decrease in students' motivation and engagement in learning. I used a descriptive case study methodology to explore the perceptions and experiences of teacher librarians teaching students with interactive whiteboards. Specifically, (a) what were the perceptions of the teacher librarians about using interactive whiteboards to encourage students' engagement in library classroom activities and student motivation for learning; (b) how and in what ways were, or were not, the teacher librarians incorporating interactive whiteboards into their multiple literacies curricular goals; and (c) what did teacher librarians perceive to be their greatest benefits and challenges teaching with interactive whiteboards?

As the technology resource within both their schools and their school systems, teacher librarians taught students 21st century literacy skills using technology (American Library Association, 2008.; Asselin & Doiron, 2008; Johnson, 2011; Marcoux & Loertscher, 2009; Martin, 2008; Small, Shanahan, & Stasak, 2010; Small, Snyder, & Parker, 2009; Socol, 2010). They enlivened students' curiosity with research-based problem solving and technology (Small et al., 2009). Teacher librarians taught media, information, digital, and print literacies, as well as technological skills to students and fellow teachers.

Cervetti et al. (2006) argued for the recognition of the different literacies with differences between cultures and time periods. In addition, they recommended an acknowledgement of literacy as "a social practice" (Cervetti et al., 2006, p.380), and more than just the ability to read and write. Other researchers highlighted the necessity for students to learn how to recognize not only what is important in a written text, but also in a complex multimodal text, a static image or the modal elements in an animation (AASL, 2010; Cope & Kalantzis, 2007; Jewitt, 2008; Kress, 2003; Martin, 2008). Teacher librarians provide instructional support in multi-literacies for both teachers and pupils (Brewer & Milam, 2006; Morris, 2004; Zmuda & Harada, 2008).

Teacher librarians evaluate and select materials and technologies to support the educational philosophy and curriculum of schools (Stroup et al., 2010). Researchers have found that teacher librarians consider their primary role to be teaching students and teachers how to use a variety of electronic resources to locate, analyze, evaluate, and synthesize information (ALA, 2008; Brewer & Milam, 2006; Socol, 2010; Stroup et al., 2010; Urquhart et al., 2005). Teacher librarians provide leadership roles in the adoption of technology, facilities management, and instructional and collaborative pedagogical design and implementation (Hay & Todd, 2010).

Design Selection

I selected a qualitative research design for this case study. According to Merriam (2002), qualitative research is predicated on the concept of reality as a social construct created by individuals to bring order and meaning to their worldview. These "multiple constructions and interpretations of reality" (Merriam, 2002, pp. 3-4) do not remain

constant but rather changed over time. Creswell (2007) commented that researchers brought their own assumptions and world views to their research, making it imperative that they remain cognizant of possible effects the assumptions might have on how they conduct their research and their writings.

I might have been biased in that the experiences that I have had teaching with an interactive whiteboard have been positive. Merriam (2002) emphasized the importance of acknowledging and monitoring biases. For this reason, I kept a journal of the research process to record my thoughts about the responses of the teacher librarians. This enabled me to separate my experiences with interactive whiteboard technology from those of the teacher librarians who participated in the study.

This study was unique as it was the first where a researcher asked teacher librarians for their experiences and observations as to the teaching effectiveness and the learning support potential of interactive whiteboards. In this qualitative research, I gave teacher librarians a voice about the benefits and the challenges they observed and experienced. The results from this case study might enable them to discover the best ways to incorporate interactive whiteboards into the curriculum. It might provide the teacher librarians with opportunities to share their discoveries and lessons learned with other educators, through their roles of technology leaders in the schools.

I considered several qualitative research designs for this study. Yin (2009) emphasized that the research design should provide a logical progression that links the data to the study's research questions and thus, to its analysis and conclusion. Possible qualitative research design selections included phenomenology, ethnography, case study,

grounded theory, and narrative, before narrowing my choices to three. The narrative, ethnographical, and case study research designs received serious review.

Hatch (2002) defined the narrative design as revolving around the stories that people use to define their lives. I considered the narrative design as two of the teacher librarians had previous experience teaching with an interactive whiteboard as classroom teachers for several years. I rejected this approach as being possibly too limiting in its depiction of the role of teacher librarians, as classroom teachers and teacher librarians often perform different functions within the school setting.

I considered the ethnographic methodology as well. Hatch (2002) stated that this design required personal interviews, artifact collection, and observations of the participants. In order to protect the confidentiality of the participants, the research committee for the Laurel Falls School District would not allow observations and personal interviews. Therefore, I rejected the ethnographic design.

Merriam (2002) defined a case study as the examination of a particular individual, locale, community, or program. As this methodology would provide rich, textural descriptions of a bounded system (Creswell, 2007; Hatch, 2002; Merriam, 2002), I chose the case study design. Using a questionnaire and a face to face focus group interview enabled the teacher librarians to share their experiences with interactive whiteboards as educational tools to teach literacy. The descriptive case study research design provided an avenue to describe the differences and commonalities of their experiences (Yin, 2009).

Selection of Participants

I selected ten teacher librarians of a school system in the United States as possible participants in this case study. These teacher librarians had two to ten years' experience in teaching with interactive whiteboards, as well as four to twenty years' experience as educators. Each of these individuals had a master's or specialist degree in library media technology, library science, or instructional technology with school library emphasis. All individuals who acted as the teacher librarians for their schools were invited to participate in this study. Four of the ten teacher librarians volunteered to participate in the case study.

These teacher librarians were the literacy and technology leaders at their schools for students, teachers, and administrators (Small et al., 2009; Stroup et al., 2010). Each of the teacher librarians was a member of a school-based technology support team, providing technology training at their schools to their fellow educators. They were representative of the entire school system, as both experienced and less experienced ones from both large and small schools were included in the study. Some of the teacher librarians used interactive whiteboards to teach students, as well as to train teachers in best practices for the interactive whiteboards.

Justification for Number of Participants

Although I anticipated that 10 teacher librarians would be available for the questionnaire and the focus group, only four teacher librarians participated in the study. Creswell (2007) recommended four to five participants for case study research (p. 128). These participants provided an accurate view of the overall skill levels of the teacher

librarians, as there were varying degrees of interactive whiteboard usage and different grade levels at their schools (i.e., three elementary schools, and one middle school). Merriam (2002) recommended case study research for its ability to possibly "improve practice" (p. 179). Through the collection of data based upon the common experiences and perceptions (Walker, 2013), the descriptive case study design enabled me to explore the experiences of the participants in teaching with interactive whiteboards.

Procedures for Gaining Access

I sought permission for this study from the Walden University Institutional Review Board (IRB) before seeking permission from the assistant superintendent and the research committee of the school system. Upon obtaining permission from both the school system and from the Walden University (IRB approval number 0122508), I asked the director of library media services for assistance in approaching the teacher librarians in order to ask them to respond to a questionnaire and/or to participate in a focus group interview. All questionnaire respondents and focus group participants were asked to sign consent forms for the focus group and/or the questionnaire. All information which could identify the participants was excluded from this case study in order to protect the confidentiality of the educators, their schools, and their school system.

Relationship to Participants

Although I am a teacher librarian, I did not work for the Laurel Falls School District, nor did I perform a supervisory role in evaluating the performance or job continuation of the participants in the study. I volunteered in the libraries of two of the

elementary schools, checking out books to students and teachers, and helping with the library inventory prior to this case study.

Ethical Protection

To ensure confidentiality, I used pseudonyms for the names of the participants, their schools, and the name and location of the school system. All participants signed letters of consent, informing them of their rights and the measures taken to ensure the protection of their privacy and protect them from harm. These letters of consent explained that they were not required to participate in the study. No incentives were given to the participants. Their administrators would not know who participated in the study. At any time the teacher librarians could withdraw from the study. A letter describing the study (see Appendix C) and consent forms (see Appendix D and Appendix E) were e-mailed to each potential participant using their school email address by the director of media services. The director copied me on the email and provided the school email addresses of all of the teacher librarians. If there was no response within one week, I sent another e-mail to those individuals.

Data Collection

Using an online questionnaire and a face to face focus group interview, I explored the teacher librarians' perceptions of student engagement in classroom activities and in student motivation. All data collected for this qualitative case study were analyzed to identify commonalities and differences of experiences amongst the teacher librarians regarding their use of interactive whiteboards.

Focus Group

Four teacher librarians participated in the focus group interviews. All participants received informed consent forms (Merriam, 2002) via email 2 months prior to completing the questionnaire and participating in the focus group interview. The participants electronically signed the consent forms for the questionnaire and e-mailed them to me using their home email accounts.

Per the instructions of the school system, the focus group was 60 minutes in length. Rubin and Rubin (2005) and Creswell (2007) emphasized the importance of preparing protocols and questions ahead of time. Using semi structured questions enabled me to follow new threads to explore during the focus group (Hatch, 2002; Stark, 2010; Yin, 2009). A copy of the focus group questions can be found in Appendix F. These nine questions concerned the perceptions and experiences of the four teacher librarians. Janesick (2004) argued that one of the strengths of a focus group was the interactions among the participants, rather than with the interviewer, as it could enable "a greater understanding of participants' points of view" (p. 81). I audiotaped the face-to-face focus group using a Sony microrecorder and the SpeakEasy application on my cell phone (e.g., Hatch, 2002, p. 100). In order to ensure the privacy of the teacher librarians, no video cameras were used. All data were saved on two password-protected flash drives and will remain stored in a locked safe at my home for 5 years.

I used Adobe Audition 3.0 to aid in separating and deciphering the four voices of the teacher librarians. The focus group interview was transcribed within 1 week and returned to the four participants to be checked for accuracy before coding (e.g., Creswell,

2007; Petzke, 2009). Stark (2010) recommended recording the precise wording of the participants, as well as laughter, pauses, and changes in pitch of their voices (p. 181). By watching and listening closely, I was able to notice unspoken communications, as well as softly spoken conversations among the participants. The transcription was e-mailed to the four participants via their home e-mail addresses which they provided upon signing the consent form.

Member Checking

I discussed initial themes developed from the focus group with two of the participants for member checking (e.g., Hatch, 2002). I followed the focus group protocols recommended by Hatch (2002), Creswell (2003), Rubin and Rubin (2005), and Dilshad and Latif (2013). As the other two teacher librarians did not return my e-mails, I was unable to confirm these themes with them.

Questionnaire

Three of the four teacher librarians who participated in the focus group completed a questionnaire consisting of 12 Likert response questions and four multiple choice questions. A copy of the questionnaire is attached to Appendix E. The fourth focus group participant did not return the questionnaire although it was requested twice. I emailed the questionnaire to each of the participants' home e-mail accounts that they had provided upon signing the consent form to participate in the study. The three teacher librarians who returned the completed questionnaire either e-mailed their completed questionnaires to my personal e-mail account or mailed them to my home address. I saved their

responses to the questionnaire on two password-protected flash drives and deleted their e-mails, in order to protect their confidentiality.

Data Analysis

Focus Group

I analyzed the comments of the focus group participants for common words, themes, concepts, elements, and phrases, before clustering the data (Patton, 2002; Petzke, 2009; Rubin & Rubin, 2004), using Microsoft Office Excel to create tables. Patton (2002) emphasized the importance of "identifying significant patterns, and constructing a framework for communicating [to reveal] the essence of…the data" (p.432). The themes developed from the focus group included:

- visual learning
- perceived effect on students
- perceived value of interactive whiteboard
- teaching of multi-literacies
- use of interactive whiteboards
- collaboration
- teacher librarians as instructional leaders
- teacher librarians as technological leaders
- self-efficacy
- perceived challenges of the roles of teacher librarians

Creswell (2007) and Petzke (2009) recommended using bracketing when describing participant commonalities. Petzke (2009) described bracketing as "set [ting]

aside personal knowledge [to ensure that]… it did not influence" (p.42) the phenomenon under investigation. Using journal notes, I bracketed my own knowledge and experience of teaching with interactive whiteboards in the library classroom.

Member Checking

I verified the themes that developed from the focus group interview via e-mails and telephone conversations with two of the teacher librarians who participated in the focus group. The other two participants did not return my emails. The peer reviewer and I discussed and verified these themes via emails and face to face interactions.

Questionnaire

I used Survey Monkey to create the questionnaire. The 12 Likert response questions and the 4 multiple choice questions were based upon the information gleamed from the literature review.

Following the advice of Miles and Huberman (1994), I identified and developed themes by correlating the participants' responses (Petzke, 2009) to the three research questions, the themes developed from the focus group interview, and the information gathered from an internal school system report for the Laurel Falls School System (pseudonym). These themes included:

- use of interactive whiteboards by teacher librarians
- resources used with interactive whiteboards
- perceived value of interactive whiteboards as instructional tools
- perceived effect of interactive whiteboards on students
- teaching of multi-literacies

- self-efficacy
- roles of teacher librarians as technological and instructional leaders

Using phone conversations, emails, and face-to-face interactions, the peer reviewer and I discussed and verified these common themes and the coding of these themes (Creswell, 2003; Merriam, 2002; Petzke, 2009). The peer reviewer has an Ed.S. in the field of instructional technology, add-on certification in library media, and ten years of experience as an educator. A copy of the peer reviewer's signed confidentiality agreement can be found in Appendix G.

Internal documents for the Laurel Falls School System (pseudonym) provided additional details regarding the role of the teacher librarians in implementing the 2013-2016 Technology Plan for the state's department of education. These duties included:

- monthly meetings with the director of library media services, technology staff members, and fellow teacher librarians;
- consultations with experts in instructional technology from local universities and colleges;
- presentation of professional development in the integrations of the National Educational Technology Standards for Students (i.e., NETS.S) to classroom teachers
- participation in the development of a plan for assistive technology for special needs students
- creation of staff development based upon professional learning workshops they attended

- development of documents for additional reference materials for all faculty members (Laurel Falls School District, 2012).

I cross referenced the data gathered from the internal documents with the data from the focus group interview, the responses to the questionnaire, and journal entries. I color coded the themes before entering them into a Microsoft Excel spreadsheet.

Evidence of Quality and Procedure

Miles and Huberman (1994) described the process of coding as an initial but ongoing exercise that usually forces researchers to change their perspectives, and uncover possible biases and incomplete data (p.65). I uploaded the recording of the focus group interview to Adobe Audition 3.0, and listened to the recording twenty times, so that I could capture all pauses, hesitations, laughter, and comments (e.g., Merriam, 2002). After transcribing the focus group interview, I read it fifteen times to determine common themes (e.g., Creswell, 2007; Lawrence-Lightfoot & Davis, 1997). I identified and defined significant themes, and found the commonalities of these themes. The data collected from the focus group, the responses to the questionnaire, my journal entries, the information gained through member checking with two of the participants, and the Laurel Falls School System's public documents from their website were used for triangulation (Creswell, 2007; Dilshad & Latif, 2013; Lawrence-Lightfoot & Davis, 1997; Merriam, 2001).

I conducted member checking through discussing the analyzed data from the focus group and from the questionnaire with two of the teacher librarians who participated in the interview. The other two participants did not return my emails. As

previously stated, the peer reviewer and I reviewed and discussed the results of the analysis of the data from the questionnaire and the focus group.

Findings

In this case study, I described the experiences and observations of four teacher librarians using interactive whiteboards in library classrooms to teach information, media, digital, and print literacies. Four of the teacher librarians participated in the focus group. Three of these participants answered and returned the questionnaire, but the fourth teacher librarian declined to answer the questionnaire. I triangulated the findings from the questionnaire, public documents from the Laurel Falls School District, the findings from the focus group interview, my journal entries, and the literature review to code, and analyze the data (Hatch, 2002; Rubin & Rubin, 2005; Stark, 2010).

The teacher librarians explained how they used interactive whiteboards for instruction. They described the value of the visual aspect provided by the electronic whiteboard, and their perceptions that interactive whiteboards were effective instructional tools in maintaining students' engagement in lessons. The teacher librarians discussed the collaborative, instructional, and technological support and training they provided to classroom teachers. They related how they incorporated interactive whiteboards and other digital resources into their pedagogical goals. I coded tthese findings to the three research questions, listed below.

> Research Question 1: What did the teacher librarians perceive as to whether the use of the interactive whiteboard in encouraging student motivation for learning and student engagement in the classroom?

Research Question 2: How and in what ways were, or were not, the teacher librarians incorporating interactive whiteboards into their multiple literacies curricular goals for teaching media and information literacy?

Research Question 3: What were the greatest benefits and challenges that the teacher librarians found in teaching with interactive whiteboards?

Using these three research questions as the foundation to create the questions for the questionnaire and the focus group interview enabled me to explore the experiences and perceptions of the teacher librarians using interactive whiteboards for instruction.

Teacher Librarians' Perceptions of Student Responses

Using the first research question, I asked the teacher librarians for their perceptions of whether, or not, the use of interactive whiteboards encouraged students' engagement in library classroom activities and increased students' motivation for learning.

Visual Literacy

The teacher librarians observed several aspects of the interactive whiteboards that appealed to children, particularly the aspect of visual literacy. Riesland (2003) defined visual literacy as the ability to communicate and understand through visual images. During the focus group, Anna observed, "Kids love it…They can all see. The benefit is - they can't always see a book" (i.e., a book held aloft by the teacher librarian while reading to students during story time). Interactive whiteboards enabled teachers to "easily create enlarged texts and text manipulation activities" (Gill & Islam, 2011, p.225). Cuthell (2010), Reedy (2010), Schwartz and Thormann (2010), and Winzenried et al.

(2010) described interactive whiteboards as effective instructional tools for visual learners, as well as aural and kinesthetic learners (McQuillan et al., 2012).

During the focus group, Toby stated, “I prefer “to use it all the time…even if I [do not]…have anything interactive to do.” Toby particularly enjoyed the visual aspect of the interactive whiteboard when teaching. Toby noted that the interactive whiteboard helped with children who were “visual learners especially [by]…just having something for them to associate with, like…a picture of the book and the author.” The interactive whiteboard helped the students to focus, providing additional visual clues to enhance their literacy instruction (Chen & Tsai, 2013; Morgan, 2008).

Perceived Effect of Interactive Whiteboard on Students

In the focus group interview, Anna commented, “I find the children are really excited about [the interactive whiteboard]. They always want to use it”. Mercer et al. (2010) and Sweeney (2013) found the interactive whiteboard to be effective in encouraging classroom dialogue. Two of the respondents to the questionnaire indicated that the students participated more when taught with an interactive whiteboard, while the third teacher librarian discerned no change in student engagement. Wood and Ashfield (2008), Liang, Huang, and Tsai (2012), Livingstone (2012), and Hillier, Beauchamp, and Whyte (2013) found interactive whiteboards maintained students’ concentration and motivation to learn, thus enhancing literacy instruction (Gill & Islam, 2011; Lisenbee, 2009).

In their study of primary school students, Yán□ez and Coyle (2011) observed the interaction of the young students with an interactive whiteboard during classroom

activities. The children were aware that they were playing and learning at the same time "and considered this to be very useful" (Yán□ez & Coyle, 2011, p.448). Other researchers found students more engaged in classrooms using interactive whiteboards for instruction (Jewitt et al., 2007; Marzano, 2009; Morgan, 2008; Mullamaa, 2011; Rivers, 2009; Schwartz & Thormann, 2010).

Perceived Value of Interactive Whiteboards

During the focus group interview, Toby commented, "I think the benefits are [that there are] things you can do on it that you couldn't do before with teaching." Leah described providing students with opportunities "to demonstrate…whatever we're doing." Terreni (2010) and Hillier et al. (2013) observed students eagerly demonstrating the affordances, or tools, of the interactive whiteboard during classroom instruction. Lisenbee (2009) reported kindergarten teachers using interactive whiteboards to display the texts of fairy tales as they read the words aloud to the students. The interactive whiteboard's large screen enabled students to see the text as it was read to them by the teacher (Lisenbee, 2009). Afterwards, the students created their own fairy tale storylines, using the software of the electronic whiteboards (Lisenbee, 2009).

Two respondents to the questionnaire indicated that use of the interactive whiteboard encouraged their students to read. Teachers in a study by Chen and Tsai (2013) observed primary school students having a greater interest in reading when interactive whiteboards were used for instruction. The researchers described how afterwards the students wanted to read more books, often sharing picture books they enjoyed with their friends (Chen & Tsai, 2013, p. 90).

Solvie (2004), Liang et al. (2012), and Hill (2014) observed students actively participating in learning and utilizing the tools of the interactive whiteboard to answer questions. Hill (2014) described students who created a vocabulary web to help in comparing two different books (p. 30). Researchers found that manipulating the text helped students to understand the meaning of the text, and obtain a better understanding of sentence structure (Gill & Islam, 2011; Solvie, 2007; Yán□ez & Coyle, 2011). Cooper (as cited by Smart Technologies, 2005, para. 8) related how deaf students utilized the interactive whiteboard software to color-code sentences and words, thus helping them in comprehending the roles words played within sentences as well as in sentence structure. Other researchers noted that the tools of interactive whiteboard enabled teachers to increase the font size or magnify images for students with vision disabilities (Kelly, 2012; Salend, 2009). Educators used the affordances of the interactive whiteboard to provide different ways for students to learn.

During the focus group, Alex related utilizing small group discussions for students to talk about a lesson problem. After coming to a consensus within their groups, Alex explained, “One representative from [each] group comes up and writes on the board,” to post their group’s work for the entire class. In this way, the interactive whiteboard became a vehicle whereby the students could share their findings with their classmates (Gillen et al., 2007; McQuillan et al., 2012; Mercer et al., 2010). This Vygotskian approach enabled the students to learn from one another in a social constructivist context (Bay et al., 2012; Livingstone, 2012; Maher, 2012; Pritchard & Woollard, 2010).

Resources Used With Interactive Whiteboards

The three respondents to the questionnaire indicated that they used Promethean Planet to find their interactive whiteboards lesson plans (i.e., flipcharts). During the focus group interview Leah commented, “I usually try to start there, because of just the time it takes to create [flipcharts].” Researchers contended that creative lessons could be fashioned for the interactive whiteboard by effective educators (Cogill, 2003; Hur & Sug, 2012; Kennewell & Beauchamp, 2007; Miller & Glover, 2010).

In the focus group interview, Leah asserted that the interactive whiteboard “just lends itself well for introducing technology.” The teacher librarians in the focus group and on the questionnaire reported the interactive whiteboards aided in the teaching of media and information literacy, such as demonstrating databases, online encyclopedias, websites, e-books, and software packages such as Microsoft Office. In a study of 21 foreign language teachers, Kitchenham (2013) observed that 71% of the teachers found the interactive whiteboard to be effective in teaching students how to locate resources on the Internet for second language acquisition. Teacher librarians found interactive whiteboards helped in introducing technology to students.

During the focus group, Toby remarked, “We *do* [use] BrainPop *quite a bit*.” Anna stated, “I love PBS Kids.” Anna described accessing online educational videos, and webcasts of books being read for children. Sandford (2008) asserted that teacher librarians “support learning through a range of new types of texts and modes of learning” (as cited in Asselin & Doiron, 2008, p. 12). Hur and Suh (2012) and Emanuel (2013) recommended utilizing a variety of resources for learning, particularly ones with the

"richest multimedia formats [for] new learners [with] multi-modal…learning styles" (Asselin & Doiron, 2008, p. 12). Researchers emphasized that teacher librarians used technology to increase students' digital, media, and information literacy skills (Hamilton, 2011; Lamb & Johnson, 2011; Perez, 2010; Yudt & Columba, 2011).

To summarize, the teacher librarians found technology, such as interactive whiteboards, provided the aspect of visual literacy which tended to motivate students to learn. The interactive whiteboard technology enabled the teacher librarians to teach students multiple literacies by using multimodal formats aligned to students' digital media and video culture, and to their interest in technology.

Incorporating Interactive Whiteboards into Pedagogical Goals

Using the second research question, I inquired into how and in what ways were the teacher librarians were, or were not, incorporating interactive whiteboards into their multi-literacies curricular goals to teach information and media literacy.

Use of Interactive Whiteboards

During the focus group interview, both Alex and Toby stated that they enjoyed teaching with interactive whiteboards, finding it easy to incorporate them into their pedagogical goals. Toby related,

> There are a lot of tools in [the software], like 'containers,'…where you can just do…quick formative assessments, or make a flip chart to do… a new learner response type system, which before would just be pen and paper…So, it's given us a tool to…enrich what we're doing, and make our jobs a lot easier, prep-wise, I think, if you're *used* to it.

Salend (2009) recommended the use of technology for assessments, as the different formats available for use made tests more accessible for students with disabilities.

Hur and Suh (2012) found that students who were English language learners preferred the interactive assessment systems available on interactive whiteboards for the ability to receive immediate feedback whether their answers were correct or not. Moreover, the “active engagement” (Hur & Suh, 2012, p. 333) provided by the interactive assessment enabled the students to score higher grades on posttests. In a study of a primary school in Singapore, teachers described students taking the online interactive whiteboard quizzes and enjoying the “instantaneous feedback on their responses” (Tay, Lim, S., Lim, C., & Koh, 2012, p. 746). The teachers pointed out how their students wanted to retake the assessments over and over so that they could correct their mistakes (Tay et al., 2012, p. 746). In summary, the assessments available through interactive whiteboard technology encouraged student learning.

The three respondents to the questionnaire indicated that they used Promethean Planet to find their interactive whiteboards lesson plans (i.e., flipcharts). During the focus group interview, Eve recommended downloading lesson plans from Promethean Planet. Toby noted, "When I’m going through the thought process of writing a lesson plan and deciding what I want to do, I have found specific flipcharts from Promethean that I really like…They are fully editable and you can change them and make them your own.” Researchers contended that when used correctly, interactive whiteboards supported desired learning outcomes (Mercer et al., 2010; Miller & Glover, 2010; Türel & Johnson, 2012) and readily engaged students in their own learning (Lacina, 2009; Murcia, 2013;

Rosen, 2011). In conclusion, interactive whiteboards tended to motivate and engage students in learning.

Collaboration

During the focus group, when asked if they collaborate with teachers on lesson plans and to teach students, Toby, Leah, and Anna confirmed that they collaborated with the classroom teachers. Leah stated, “For me, a lot of my lessons are collaborative lessons.” This collaboration also included technical and pedagogical support for the use of interactive whiteboards and other technologies (AASL, 2010; Donham, 2011; Johnston, 2012b; Lance, Rodney, & Schwarz, 2010). Montiel-Overall (2005) defined collaboration as a relationship among trusting participants who proposed, planned, and designed lessons together, integrating information literacy with the subject content (as cited by Montiel-Overall, 2008, p. 150).

In the focus group, Leah insisted, “I feel...collaboration is the most important part.” Purcell (2010) argued that teacher librarians partnered in instruction with teachers “to provide the best learning environment…richly integrated with 21st century skills” (2010, p. 32). Researchers noted that collaboration comprised a major part of what teacher librarians believed their role entailed (Donham, 2011; Heider, 2009; Lance et al., 2010; Montiel-Overall & Jones, 2011; Wolf et al., 2003).

One focus group participant found collaboration more problematic, as the school policy had created a partially fixed schedule for the library media center. Van Duesen (1996), Heider (2009), and Francis and Lance (2011) observed that flexible schedules gave teacher librarians more opportunities to design lessons collaboratively with

classroom teachers. Researchers found greater student achievement when teachers and librarians worked collaboratively to create lessons (Lance et al., 2010; Montiel-Overall, 2008; Morris, 2004).

Leah and Toby described collaborating with teachers on research units, and using Eisenberg and Berkowitz's Big 6 Skills to teach students' research skills (Heider, 2009; Wolf, Brush, & Saye, 2003). Toby taught a unit on Eisenberg and Berkowitz's Super 3 research skills to both teachers and students as well. Leah related, "I keep going back to the Big 6…I went back and revisited it this year because I'm trying to do a…scope and sequence for research skills in K-3…I think [the Big 6]…still captures the essence of what research is." (See Appendix L for more information on the Big 6 and the Super 3). Leah opined, "They teach writing and they teach reading, but connecting it all together? I think the Big 6…gives the *teachers* a framework for understanding the whole process [of research]." By using the metacognitive scaffolding provided by the Big 6, teacher librarians helped students to perform research efficiently and successfully complete their projects (Heider, 2009; Wolf et al., 2003). Use of the Big 6 and the Super 3 may facilitate the research for students.

Heider cautioned that elementary school teachers had a tendency to "under or overestimate the kind of research assignments" (2009, p. 513) that their pupils could complete. Working collaboratively, teacher librarians and teachers could design meaningful projects for student research activities, thus increasing student knowledge and student achievement (AASL, 2008; Cooper & Bray, 2010; Heider, 2009; Kuhlthau, 1987,

Loertscher & Diggs, 2009; Zmuda & Harada, 2008). In conclusion, teachers and teacher librarians could collaborate to help students successfully complete their research projects.

Teacher Librarians as Technological Leaders

Toby, Alex, and Leah described providing technology lessons to classroom teachers. According to internal documents for the Laurel Falls School District, the teacher librarians attended professional development with the understanding that they would share what they learned with other teachers at their schools (Laurel Falls School district, 2012). After attending professional development, and re-teaching it to teachers in the district, Alex observed, "I…*owned* it at that point." Toby commented, "I agree…I've had to co-teach, and then I've had to redeliver it on my own for a class." Leah and Toby described teaching monthly technology lessons to teachers. Researchers found teacher librarians provided technology training to teachers and students (Kenney, 2011; Zmuda & Harada, 2008). To summarize, teacher librarians taught their fellow educators how to utilize school technologies effectively.

Teacher Librarians as Instructional Leaders

During the focus group discussion, the teacher librarians described their efforts in mentoring and coaching their fellow teachers, particularly the ones who rarely used their interactive whiteboards. Leah cautioned that learning how to use an interactive whiteboard "…is *time*-consuming…You really have to…consciously make an effort to do [it]." Toby agreed, but noted that it "[is] less time-consuming when you get more proficient. And that's what teachers don't want to buy into." Researchers argued that professional development for teachers should include both technical skills and

pedagogical skills to help incorporate the interactive whiteboard and other technologies into the curriculum (Kitchenham, 2006; Perez, 2011; Punie, Zinnbauer, & Cabrera, 2006; Sundberg, Spante, & Stenlund, 2012). As the instructional and technological leaders in school, teacher librarians provided instruction and support to their fellow teachers.

During the focus group interview Alex noted, “When I’m teaching the [interactive whiteboard] software… I use the board totally, and I get the teachers up there touching it.” AASL (2010), Everhart et al. (2010), Loertscher (2010), and Stroup et al. (2010) contended that teacher librarians provided their fellow teachers with both technological and instructional support, including the use of interactive whiteboards and other technologies. Researchers found that students reported feeling more engaged in classroom activities when the teachers utilized the affordances, or tools, of the interactive whiteboard well (Beauchamp et al, 2010a; Isman et al., 2012; Murcia & Sheffield, 2010). This instructional and technological support facilitated improved classroom instruction and student learning.

In the focus group, Alex described advising teachers to instruct students in how to use the tools of the interactive whiteboard. Alex asserted, “The kids can show teachers stuff as well. Once they learn a few tools, they’re…showing us how to do things.” Researchers found that students enjoyed multimedia and technology, and looked for opportunities to teach their peers and their teachers what they knew (Hill, 2014; Hockley, 2013; Terreni, 2010; Yán□ez & Coyle, 2011). Solvie (2007), Winzenreid et al. (2010), Mullamaa (2011), and Hockley (2013) recommended involving students in the production of interactive whiteboard lessons by providing them with opportunities to

actively contribute to their own construction of knowledge and learning (Northcote, Mildenhall, Marshall, & Swan, 2010; Underwood & Dillon, 2011). During the focus group interview, Alex suggested that the five–year goal for all teachers should be teaching students how to create flipcharts for the interactive whiteboard. Northcote, et al, (2010) found students tended to be more responsive to lessons taught with interactive whiteboards, as they felt challenged by the tasks (p. 507). In summary, using technology during classroom activities could engage students in learning.

Sweeney (2013) argued that "technical difficulties, [feeling] professionally isolated from supportive colleagues…and constrained by rigid timetabling" (p. 227) could result in a negative impact on teachers' implementation of interactive whiteboards into classroom pedagogies. Researchers recommended regular professional development in the use of interactive whiteboards (DeSantis, 2012; Hockly, 2013; Miller & Glover, 2010; Sweeney, 2013). Everhart et al. (2010), Perez (2011), and Steck and Padget (2012) found that teacher librarians worked with teachers to plan lessons, learning strategies, and assessments for all subjects and grade levels through collaborative conferencing. Teacher librarians provided the technological and instructional support needed for effective employment of interactive whiteboards in the classroom.

Teaching Multi-literacies

On the questionnaire, only one of the teacher librarians reported doing teaching information and media literacy to students. During the focus group interview, however, three of the teacher librarians described teaching information and media literacy to students, using Internet sources and technologies such as laptops and interactive

whiteboards. Leah described collaborating with a classroom teacher to help students to create original PSAs (i.e., public service announcements) using laptops. The teacher librarian stated, "It was really in the context…they were introducing *PSAs*, and I thought that would be a good chance to do that." Leah showed the students how to critically analyze old televised advertisements using interactive whiteboard technology advertisements, displaying the ads on the interactive whiteboard for everyone to see. Researchers asserted that effective teaching of multiple literacies enabled students to think critically, to draw conclusions, and to create their own productions (Hill, 2014; Jewitt & Kress, 2010; Wilson, 2012). Teacher librarians taught information and multi-literacies skills to students using different technologies, such as interactive whiteboards and laptop computers.

Teacher librarians promoted student literacy through creative use of technology (AASL, 2010; Asselin & Doiron, 2009; Bell, 2001; Yudt & Columba, 2011). In the focus group interview, Toby described using the interactive whiteboard to teach map skills as "it just helps so much in that way [for]…things like doing Google Earth and trying to find something together. They can all see." Hill (2014) observed second grade students utilizing interactive whiteboard templates to create reading logs and vocabulary webs for class discussions. Teaching these multi-literacies skills enabled students to analyze images and data (Cuthell, 2010; Hobbs, 2010; Wilson, 2012)

On the questionnaire, two teacher librarians indicated that the interactive whiteboard helped students with their digital literacy, in their use of search engines; the other respondent disagreed. Wilson asserted that teaching multiple literacy skills gave

students the ability to “understand the word on the page and the image on the screen” (2012, p.16). In the focus group interview, Leah remarked, “Sometimes I use [the interactive whiteboard] to interact with websites. That’s probably what I do the most.” Sweeney (2013) argued that using websites provided valuable resources for teachers for instruction (p. 223). Teacher librarians taught students digital, information, and media literacy skills, including how to use the Internet to navigate websites.

In summary, the teacher librarians utilized technology to teach literacy. They collaborated with classroom teachers to teach multi-literacies, including information, digital, and media literacy (AASL, 2010). They provided instructional and technological leadership to teachers to encourage students’ participation in classroom instruction, including instructional assistance with the interactive whiteboards. The teacher librarians taught students and teachers technological and multi-literacies skills.

Benefits and Challenges of Teaching with Interactive Whiteboards

Using the third research question, I asked the teacher librarians as to what they perceived to be the benefits and challenges of teaching with an interactive whiteboard. Beauchamp and Kennewell (2010), Jewitt and Kress (2010), and Gadbois and Haverstock (2012) found benefits to the use of interactive whiteboards including interactivity, multimodal presentation, flexibility, and efficiency. Kalantzis, Cope, & Harvey (2003) insisted, “Texts are now designed in a highly visual sense, and meaning is carried as much visually as it is by words and sentences” (p. 22). Interactive whiteboard technology can be used to teach with a variety of modalities.

Benefits of Teaching with Interactive Whiteboards

The teacher librarians related several benefits to teaching with interactive whiteboards. For example, Leah found the electronic whiteboards to be effective for teaching media and information literacy, particularly in demonstrating software packages. Northcote et al. (2010) concurred that interactive whiteboards were effective for conducting Internet searches and demonstrating software. During the focus group interview Toby observed, "They can all see. I mean, before [interactive whiteboards], you would…have to…look at a computer or something like **t**hat. So there are a lot of ways that it's helped make teaching better by what it provides." Gatlin (2004), Mercer et al. (2010), and Hennessey (2011) noted that the use of the interactive whiteboard was effective in encouraging classroom dialogue.

Gadbois and Haverstock (2012) observed that the science teachers in their study found the interactive whiteboard enable them to better organize stored information (p.128). During the focus group, Toby described the interactive whiteboard as effective for "materials management [including]…hundreds and thousands of flash cards and pictures." De Jong, Kourtzi, & Ee (2012) asserted that "repeated activation of [the brain's] visual networks" (p. 3731) stimulated reactivation when presented with a similar visual image. In a study of 33 foreign language teachers in a secondary school in Italy, Ghislandi and Facci (2013) found that over 40% of the teachers used the interactive whiteboard to show videos, photos, software, and other online materials in the teaching of Italian, Greek, and Latin. Researchers found that displaying digital images and moving

print on the interactive whiteboard tended to encourage classroom discussion and student participation in classroom activities (Hennessey, 2011; Wood & Ashfield, 2008).

Three of the teacher librarians indicated on the questionnaire that students were more motivated to learn when the interactive whiteboard was used during instruction. The multimodal approach for instruction afforded by interactive whiteboards engaged students' interests and motivated them to learn (Ghislandi & Facci, 2013; Hall & Higgins, 2005; Hodge & Anderson, 2007; Jang & Tsai, 2012; Sweeney, 2013). In conclusion, the teacher librarians found the interactive whiteboards to be effective for multimodal instruction.

Challenges of Teaching with Interactive Whiteboards

During the focus group interview, the teacher librarians identified several technical issues with interactive whiteboards, such as interactive whiteboard pens that ceased to work, or the interactive whiteboards needed to be recalibrated (Reedy, 2008; Yán□ez & Coyle, 2011). Leah related, "I've really tried hard to make the hardware *reliable* and maintained." Anna recommended teaching troubleshooting to classroom teachers. Toby emphasized the ongoing problem with the "need to recalibrate" the interactive whiteboards. Researchers observed that students found the need to recalibrate the interactive whiteboard frequently during instructional time to be especially annoying (Gatlin, 2007; Hall & Higgins, 2007). Biró (2011) and Serow and Callingham (2011) argued for providing teachers with training in troubleshooting technical issues, before such problems became an issue in the classroom. The teacher librarians provided technological assistance to the classroom teachers.

On the questionnaire, two teacher librarians reported that they found the interactive whiteboard not to be appropriate for all lessons. One respondent to the questionnaire reported that teaching with the interactive whiteboard enabled that teacher librarian to meet students' multiple learning needs. The other two teacher librarians indicated on the questionnaire that they were not sure if the interactive whiteboard helped in that way. In responding to the questionnaire, the teacher librarians were unsure of the appropriateness of interactive whiteboard technology for all lessons.

During the focus group, Leah noted, "I do think the Activboards are great, but I don't think, ultimately, that's what boards and libraries will look like. I think they'll look like touch-screens, and…will be a more fluid part of *any* classroom." Leah envisioned a big touch screen just inside the entrance to the library and could be available for use continuously. The teacher librarian mused, "The kids could interact with it…look up a book on it or…do a lesson." Levy (2002) argued that interactive whiteboards encouraged student interaction through the visual appeal, as well as the ability to manipulate data and objects on the board (Celik, 2012).

During the focus group interview Leah stated, "There are still too many barriers [such as] the calibrating…as opposed to [something that is] just more fluid [and]… always available for interaction." Yelas and Engels (2010) warned that teachers could become frustrated with interactive whiteboard functionality that failed to provide easy access (p. 443). Hsu (2010) and Ghislandi and Facci (2013) recommended ongoing technological and pedagogical professional development so as to create a "culture, or the set of behaviours, actions, initiatives, and attitudes that lead to good use of technology"

(Ghislandi & Facci, 2013, p.11). Effective training would enable teachers to incorporate technology into pedagogical goals, and to handle troubleshooting issues (Biró, 2011; Hsu, 2010; Yelas &Engels, 2010). The teacher librarians recommended teaching classroom teachers how to troubleshoot technical problems.

Self-Efficacy

When asked about the learning curve that they had experienced in using the interactive whiteboards, Toby felt "fluent" with the affordance within a few months. Toby cautioned, "*If* you're using it every day…that's what [I try] to tell teachers. Just like other areas of teaching [and] technology, you *have to practice it."* Yudt and Columba (2011) noted the crucial need for teachers to incorporate the interactive whiteboard into whole-class instruction. They emphasized the necessity of teachers having "a solid understanding of how the technology works" (Yudt & Columba, 2011, p.19). Jang and Tsai (2012) argued for continuous professional development so that teachers could obtain maximum benefit from teaching with interactive whiteboard technology (p.1460).

Alex related, "I'll have to admit… It's…taken me…three years of teaching the class to [be able to]…just say, 'Here's my basic flipchart which has several tools I want to show you,' and I give the pen [to a teacher]." Hodge and Anderson (2007), Marzano (2009), Rivers (2009), and Sweeny (2010) described how teachers evolved through time in their use of interactive whiteboards and ICT, in general (Crook, Harrison, Farrington-Flint, Tomas, & Underwood, 2010; Orlando, 2013). For example, in a longitudinal study of ICT use in New South Wales, Australia, Orlando (2013) described a teacher who allowed one of the 12 Year students to teach a unit on the use of a certain animation

software program to fellow students (p.237). Over time, teachers gradually released more and more control of the electronic whiteboard to their students (Shattuck, 2009; Sweeney, 2010). Educators needed time to incorporate interactive whiteboard technology into their pedagogy.

Leah related how many of the teachers at Moore's Creek Elementary took ownership of the interactive whiteboard: "they have…their remote 'Velcro-ed' [so that] they know where it is…It's obvious that [these teachers]...know the *mechanics*…When they go to use it, it's not stressful. They…have control over it." Researchers found that teachers believed they were more effective after interactive whiteboards were installed, as their students were more collaborative, motivated, and engaged in learning (Harlow, Cowie, & Heazlewood, 2010; Türel & Johnson, 2012; Whitby et al., 2012). Sharma (2012) argued that effective use of technology in the classroom contributed to a deep understanding by students of the lessons taught (p. 96). Thus, effective training in the use of interactive whiteboards helped students to learn.

Leah described mentoring a fellow teacher to rearrange the classroom, thus making the interactive whiteboard "the center of the teaching area." Gruber (2011) described an initiative to install Promethean ActivBoards in all of the middle schools in a school district. Each interactive whiteboard was installed at the front of the classroom, making it "a centerpiece to teachers' instructional delivery [and failure to use it]…conspicuous" (Gruber, 2011, p. 252). The positioning of an interactive whiteboard may affect how much a teacher may integrate it into the classroom pedagogy.

Leah commented that another teacher resisted using the interactive whiteboard. The teacher librarian noted that the teacher "just has it in the wrong… Well, it's not that it's in the wrong place, but [the] classroom is rearranged to…" Alex finished the sentence, "To block it, to not make it the center." Researchers asserted that when a classroom was not designed for optimal use of the interactive whiteboard, visibility by all the students in a classroom became problematic (Sundberg et al., 2012; Wong, Goh, & Osman, 2013). The teacher librarians felt the interactive whiteboard should be at the front of the classroom.

Toby, however, portrayed an entirely different picture of interactive whiteboard use. Toby described teachers who had become "so dependent on [the interactive whiteboard]. I have teachers whose projector has *died* or something has happened. …That's the whole other end – that [they] …don't know *what to do* if they don't have *their Activboard*!" Winzenried et al. (2010) described teachers who "felt positive, even invigorated" (p. 546) by the use of interactive whiteboards as instructional tools. Mathews-Aydinl and Elaziz (2010) found a strong correlation between the number of hours of use and the degree to which the teachers enjoyed teaching with interactive whiteboards (p. 247**).** Regular use enabled teachers to use interactive whiteboard technology effectively.

Toby described using the interactive whiteboard every day "…for every lesson, every class, very interactive, so I [am] used to it being a big component of what I was doing…I find it easy to incorporate it and use it." On the questionnaire, one teacher librarian indicated that the interactive whiteboard aided in matching the curricular goals.

Another respondent disagreed, while the third teacher librarian was not sure. In a study of 1441 literacy teachers using technology in the classroom, Hutchison (2012) found that 81% of the teachers felt their professional development did not prepare them sufficiently to integrate technology into their pedagogical practices (p. 43). Training in the use of technology in the classroom pedagogy encouraged teachers to use the technology.

Maher (2012) and Murcia (2013) argued that for constructivist teachers acting in facilitative roles with their students, the interactive whiteboards functioned as creative tools for students to interact with each other and with their teachers (Hockly, 2013). Toby warned, “The challenge for most of us is for it to be truly interactive, and not just a poster [e.g., digital signage].” Swan et al. (2008, as cited in Luca and Weippl, 2008) and Türel and Johnson (2012) found frequency of use to be positively correlated to increased student achievement. Swan et al. (2008) discovered that the scores among students who used an interactive whiteboard almost daily in the classroom were above the mean in both language arts and mathematics. In a study of 174 teachers in grades 6-12 in Turkey, 77% of the teachers stated that the interactive whiteboard aided in their students understanding and retention of knowledge gained during instruction with the technology (Türel & Johnson, 2012). Frequent employment of interactive whiteboards in classroom pedagogy was found to be correlated to enhanced student learning.

During the focus group, both Alex and Toby recommended daily use of the interactive whiteboard. Toby noted, “Just find something to do, just a little bit every day.” Alex suggested that teachers adopt “one tool at a time.” Toby added, “I think when you have to redeliver it and you have teach it yourself, that’s when you really pick it up.”

With regards to self-efficacy Alex observed, “The only reason that I feel *somewhat* quick with it is that I’ve *taught* it so much.” Reedy (2008) argued that teachers learned more about the affordances of interactive whiteboards by training other teachers how to use the electronic whiteboards. The teacher librarians suggested that teachers should use the interactive whiteboards regularly.

Alex noted, “There are *so* many tools, and…different levels of interaction.” The teacher librarian cautioned teachers to allow themselves time to learn all of the tools, or affordances, of the interactive whiteboard. Two of the three questionnaire respondents indicated that they had received sufficient interactive whiteboard training. Researchers found that ongoing training and support for teachers aided in the effective utilization of interactive whiteboards (Hsu, 2010; Shattuck, 2009; Slay, Sieborger, & Hodgkinson-Williams, 2008; Winzenreid et al., 2010).

Koh and Divaharan (2013) found that by modeling teaching with interactive whiteboards enabled teachers to integrate the technology more effectively into the pedagogy. Girlando (2013) argued that, “Teachers modeling lessons plans for one another is essential in encouraging a positive shift in teaching methods” (p. 57). Somyürek et al. (2009) discovered regular use of interactive whiteboards to be directly proportional to the amount to time allowed for professional development, especially with regards to training to aid educators in combining the use of the electronic whiteboards with the school pedagogy. Most teachers needed three to five years to transition from being novice users of technology to users who can make effective use of technology and their applications (Brinkerhoff, as cited by Shattuck, 2009). Training and mentoring

encouraged teachers to incorporate interactive whiteboard technology into their pedagogical goals.

On the questionnaire, two of the three teacher librarians indicated that they were able to find sufficient resources for the interactive whiteboard and were comfortable creating flipcharts for instruction. Teachers in studies by Crook et al. (2010) and Gadbois and Haverstock (2012) appreciated the variety that additional online resources could bring to their lessons. British Educational Communications and Technology Agency (BECTA, 2003) described the interactive whiteboard as a technology that "encourage[s] more varied, creative and seamless use of teaching materials" (as cited in Ishtaiwa & Shana, 2012, p. 4). Teachers in a study by Crook et al., (2010) enjoyed the variety that additional online resources could bring to technology-enriched lessons (p. 22).

In the focus group interview Leah remarked, "Creating more flipcharts [is] my on-going professional goal." Lewin et al. (2009), European Schoolnet (2010), and Gadbois and Haverstock (2012) recommended that educators be allowed sufficient time to prepare lessons for successful integration of interactive whiteboards into their pedagogy. Planning time for lessons helped teachers to use interactive whiteboards in their classroom activities.

During the focus group, Toby insisted, "I find that for me personally, it's better if I create it myself; because I am able to teach it better." Shenton and Padgett (2007) noted the interactive whiteboard provided a wider array of "opportunities for [classroom] interaction and discussion" (p. 130). Researchers found the use of interactive whiteboard technology to be effective for developing and challenging students' thinking (Cuthell,

2010; Hennessey et al., 2007; Murcia, 2013; Sweeney, 2013). In conclusion, training in the use of interactive whiteboard technology can help teachers to incorporate it into their pedagogy to improve student learning.

Perceived Challenges of the Roles of Teacher Librarians

The role of the teacher librarian can have a sense of professional isolation, as often there may be only one teacher librarian in a school (Nelson, 2011, p. 72). Anna, who sat by quietly listening to the other teacher librarians, leaned forward in her chair and mused, "The role of the [teacher librarian] is like being an *outsider*. [You have] to force your way *in*…but…*expected* to be an insider." Leah and Toby agreed. Toby commented that teacher librarians needed strong communication skills. Van Duesen (1996) argued that the teacher librarian brought "the benefit of a very knowledgeable 'insider' who at the same time is an 'outsider'" (p. 243). A teacher in that study described the school teacher librarian as a collaborator and a coordinator who was able to understand the pedagogical needs for the entire school, not just those of a single teacher or grade level (Van Duesen, 1996, p.240). Teacher librarians collaborate with classroom teachers to provide instruction based upon the school pedagogy.

Whiting (2011) asserted that the school library should be the center for the development of curriculum, as librarians helped to increase student achievement through teaching the information and media literacy of "the growing demands of [the] curriculum" (p.9). Van Duesen (1996) recommended that the school principal set the expectation that the teacher librarian would be present and welcome at team level meetings across all grade levels and subject areas (p. 246). Researchers argued that

school administrators failed to have an understanding of the impact teacher librarians had on student achievement (Lance et al., 2010; Purcell, 2010). Van Duesen recommended using a flexible schedule in the school library media centers (1996). Flexible scheduling would provide teacher librarians with the time needed to collaborate with classroom teachers at team level meetings, and to collaboratively teach students with classroom teachers in the library.

Repository of Lesson Plans

When asked if a repository of interactive whiteboard lesson plans would be of benefit to them, Leah answered, "…we could totally do that in First Class…It would just be a matter of us…*deciding* that was a focus, and…a professional goal and pool our resources." In a study of an elementary school in Taiwan, teachers felt that by sharing lessons and resources, they increased their own expertise with the interactive whiteboards (Chen & Tsai 2013, p.89). Teacher librarians collaborate with classroom teachers to provide instruction based upon the school pedagogy.

To summarize, the teacher librarians found several benefits to teaching with interactive whiteboards as instructional tools in the library classroom. The teacher librarians emphasized that self-efficacy with an interactive whiteboard necessitated frequent use of all of its affordances. They provided instruction in technological and multi-literacies skills to the students and teachers of the school system.

Conclusion

Using a case study methodology, I explored the commonalities and differences of the experiences of teacher librarians using interactive whiteboards as tools to promote

multi-literacies in school library media centers in a small school system in the United States. Four teacher librarians participated in a focus group exploring their viewpoints, while a subset of three of the teacher librarians responded to a questionnaire. During the focus group, three of the four teacher librarians stated that students were more motivated and engaged in classroom activities when taught with an interactive whiteboard. Three of the teacher librarians emphasized the visual literacy afforded by interactive whiteboards. Reedy (2008), Schwartz and Thormann (2010), and Ishtaiwa and Shana (2012) described how interactive whiteboard technology helped teachers to address the needs of students as visual and multimodal learners (Alvermann, 2011).

Researchers showed how teacher librarians provided technological and instructional support as well as collaborative support to teachers (Asselin & Doiron, 2009; Hamilton, 2012; Yudt & Columba, 2011). During the focus group interview, two of the teacher librarians emphasized the importance of daily practice with the tools of the interactive whiteboard. Shattuck (2009) cautioned that full fluency with all of the interactive whiteboard affordances might take up to five years to acquire. Researchers emphasized the importance of time and training for effective use of the interactive whiteboards and other technologies (Crook et al., 2010; Ghislandi & Facci, 2013; Girlando, 2013; Hutchison, 2012; Mathews-Aydinl & Elaziz, 2010; Somyürek et al., 2009).

During the focus group, three of the teacher librarians reported that their primary source for interactive whiteboard lessons was the vendor provided subscription based resource, Promethean Planet. A better long term solution might be a school system based

repository of lesson plans related to the mission and goals of each of the schools of the school system (Chen & Tsai, 2013). the creation of a school based community of practice that provided mentoring and coaching to less skilled teachers might aid in increasing technological skills for less skilled teachers (Callahan, Schenk, & White, 2008; Gadbois & Haverstock, 2012; Lewin et al., 2009).

These findings led to the development of a collaborative professional development project to increase the technological and instructional skills of teachers and teacher librarians using interactive whiteboards. Section three described the project, including the possible development of technology mentors to provide mentoring and the creation of a repository of technology rich lessons linked to the pedagogical goals of the school system. This project might enable educators to utilize interactive whiteboards more effectively in their classroom pedagogy.

Section 3: The Project

Introduction

The purpose of this project was to provide a three day collaborative professional development project to enhance the technological and instructional skills for the teachers of the school system using interactive whiteboards to enhance instruction. My analysis of the data gathered indicated that the four teacher librarians used the tools of the interactive whiteboards to teach multi-literacies, including information, digital, media, and print literacies. The teacher librarians expressed an eagerness to collaborate more often with classroom teachers within their schools. In this section, I will describe a collaborative professional development plan to increase teachers' instructional and technological skill in using interactive whiteboards to enhance instruction. A review of the literature encapsulating current thought on best practices for professional development for collaborative and instructional skills will be discussed. The goals and objectives of the project, as well as the rationale and the implementation plan will be explored.

Description and Goals

The theoretical foundation for this study is collaborative technical professional development (Jones & Vincent, 2010). Through the professional development activities, the teacher librarians and teachers will share their expertise and experiences of teaching with interactive whiteboards with one another. The goals of the project include enhanced use of interactive whiteboards and increased collaboration to increase student literacy as well as student motivation for learning and student engagement (Hammond et al., 2009; Sheppard, 2010; Warwick et al., 2010; Winzenried et al., 2010). The project would give

teachers the opportunity to create reusable interactive whiteboard flipcharts to use in their own pedagogical endeavors. Furthermore, the professional development would explore ways to create technology advocates (Lewis, 2007) to act as coaches and mentors.

Jacobs (2013) observed the necessity for both short term and long term goals for professional development. This project will have three immediate goals: (a) creating a database of lesson plans for the teachers to use, (b) establishing mentoring groups for teachers wanting to improve their skills with their interactive whiteboards, and (c) creating a formal schedule for teachers and teacher librarians to collaborate to develop lesson plans that teach multiple literacies skills and technological skills. Long term goals include (a) increasing skills in the use of interactive whiteboard activities, measured by an annual survey of skill and comfort level with technology, and (b) a recommended 20% growth in lesson plans added to the repository annually. These goals might enable educators to improve their technological and pedagogical skills in the use of interactive whiteboards.

Objectives

The objectives of the professional development project are to provide a better technical understanding and enhanced pedagogical use of interactive whiteboards. Using small and large group discussions, input from educators would be utilized in the creation of a repository of reviewed interactive whiteboard-centric lesson plans. A preliminary draft of best practices for the use of this repository would be created to include stewardship, governance, and content lifecycle management (Lewis, 2007; Thiry, 2010). Lifecycle management of the lesson plans would consist of creating, reviewing and

revising, and removing lessons as needed, just as textbooks need to be reviewed, revised, and/or possibly discarded. The teacher librarians and the teachers would explore ways to facilitate collaborative efforts to improve effective integration of interactive whiteboards into their pedagogical goals.

Rationale

I based the professional development project design on the teacher librarians' perceptions of themselves as collaborative and instructional leaders in the Laurel Falls School District. They described their work as instructional leaders, teaching their fellow educators how to incorporate interactive whiteboards into their pedagogical goals. The teacher librarians related their experiences in designing lessons collaboratively with some teachers in their schools, as well as their desires to collaborate with more teachers. Using the data collected and analyzed, I examined the experiences of the teacher librarians as to best practices for the successful use of interactive whiteboards within classroom activities. This profession development project would be staffed by the teacher librarians of the school system, who have the knowledge of the mission and goals of the schools. The goals of the project would be enhanced technological and pedagogical skills, increased collaboration, and the creation of a repository of reviewed technological lesson plans for the Activboards currently installed in all schools in the Laurel Falls School District.

Literature Review

Collaborative professional development formed the theoretical foundation for the project study. The Walden University Library provided access to the following databases

that I used for the research for this professional development project: Academic Search Complete; Education, a Sage full-text database; EBSCO; ProQuest Central; and Thoreau. I found additional resources at the library of a local university. Boolean search terms included: *collaboration, ICT, technology, professional development, mentoring, adult learning,* and *andragogy*.

Mercer et al. (2010) and Dhindsa and Shahrizal-Emran (2011) stressed that the effective use of interactive whiteboards hinged on educators' comprehension of ways to motivate students by engaging them in their own learning (Mercer et al., 2010, p. 207). Dees, Mayer, Morin, and Willis (2010) and Shattuck (2010) contended that school based professional development enhanced teachers' abilities to use the affordances of the interactive whiteboard, as well as other technologies. Through professional development, teachers would learn how to use interactive whiteboards effectively by integrating them into their classroom pedagogy.

Jewitt and Kress (2010) and Dhindsa and Shahrizal-Emran (2011) argued that effective use of whiteboard technology combined with a social constructivist approach formed "a classroom environment in which all students [were] actively engaged [through] out the lesson" (Dhindsa & Shahrizal-Emran, 2011, p. 406). Isman et al. (2012) found that students felt more engaged and motivated in classrooms where the instructors utilized a majority of the tools of the interactive whiteboard. Biró (2011) described students who reported finding lessons taught with interactive whiteboards as "more enjoyable, more exciting, [and] more useful" (p.35). Isman et al. (2012), Jones et al. (2011), and Serow and Callingham (2011) observed students who stated that they felt that

they had gained a better grasp of the subjects they had studied through the use of interactive whiteboards. Successful integration of interactive whiteboard technology into pedagogical goals can have a positive effect on student learning and student engagement in the classroom.

Dana and Yendol-Silva (2003), Andrew and Lewis (2004), Morgan (2008), Winzenreid et al. (2010), and Gruber (2011) demonstrated how professional learning communities within schools aided in the successful adoption of interactive whiteboards. The motivation of teachers increased when they were provided with sufficient training on interactive whiteboards (DiGregorio & Sobel-Lojeski, 2010; Mathews-Aydinl & Elaziz, 2010; Rosen, 2011). More effective use of the interactive whiteboards led to greater self-efficacy as well (Hammond et al., 2009; Serow & Callingham, 2011; Winzenried et al., 2010).

Shattuck (2010) found eight strategies that administrators needed to employ to become "not only transformational leaders but also…technology transformational leaders" (p. 25). These strategies included (a) creating the vision to transform the school culture, (b) modeling that vision, (c) articulating the expectations to meet that vision, (d) providing the necessary technology resources, (e) encouraging their staff in their efforts to integrate technology into the classroom, (f) using human capital by providing staff members who help to implement the vision, (g) using professional learning to sustain and build the technical skills of staff members, and lastly, (h) encouraging capacity building, wherein a core of staff members who are early adopters actively promote and encourage the utilization of technology in teaching (Shattuck, 2009, p. 145). Utilizing these

strategies encouraged the successful implementation of technology into the school pedagogy.

Researchers have indicated that ongoing support and training facilitated the best use of interactive whiteboards and other technologies (Kumar Bahadur & Oogarah, 2013; Lewin et al., 2009; Shattuck, 2010; Sipilä, 2014). McLoughlin (2012) advised, "Shared teaching and other forms of coaching can be used to immerse strategies into other content area classes… [thus, supporting] ongoing, job-embedded professional learning" (p. 57). Dixon (as cited in Walker, 2013) found fellow colleagues to be the best people to help in improving pedagogical practice. Other researchers contended that collegial mentoring and individualized coaching often resulted in personal growth and improved integration of technology in to pedagogical goals (Abuhmaid, 2014; Jacobs, 2013; Jones & Vincent, 2010; Koh & Divaharan, 2013; Kopkowski, 2008; Lamb, 2011). Through ongoing mentoring and coaching, teachers can improve their use of technology in their classroom pedagogy.

Repository of Lesson Plans

Desai, Freeland, & Frierson (2007), Manny-Ikan, Dagan, Tikochinski, & Zorman (2011), and Kumar Bahadur and Oogarah (2013) suggested that educators collaborate to share lesson plans with one another to save time. Researchers recommended the creation of technology rich lessons (Biró, 2012, Dhindsa & Shahrizal-Emran, 2011; Jewitt & Kress, 2010; Lamb & Johnson, 2012). Using different modalities and resources helped students to develop a broader understanding of the subjects studied (Gadbois & Haverstock, 2012; Mishra & Koehler, 2006; Rosen, 2011). Somyürek et al. (2009)

emphasized the sharing of what they termed “digital educational material” (p. 372), such as presentations, images, websites, sounds, and videos. Researchers recommended the use of print and digital resources for visual learners, videos for auditory and kinesthetic learners, and interactive activities or kinesthetic learners (Chau, 2008; November, 2009; Rosen, 2011; Socol, 2010). Alternative multimedia assessments, such as slideshows, digital film, collages, and flash animations, increased students’ technological knowledge (Murray, Sheets, & Baldwin, 2009, pp. 5-6). Researchers noted that repositories of interactive lesson plans provided teachers with grade appropriate interactive activities that engaged students in learning (Kumar Bahadur & Oogarah, 2013; Manny-Ikan et al., 2011; Somyürek et al., 2009). With shared lesson plans, teachers could have access to a wide range of modalities for instruction, thus enhancing classroom pedagogy.

Working together, the teacher librarians and classroom teachers would create technology-based lesson plans for multi-literacies skills (Liang et al., 2012), based upon the subjects that they teach and suited to the needs of their students (Oremland, 2013). These lesson plans would be uploaded to a shared repository (Gadbois & Haverstock, 2012; Lamb, 2011; Meyer, 2010). The repository of technology based lesson plans would teach multi-literacies skills related to the curricular goals of every grade level in the school system (Ferriter, 2011; Lamb, 2011). These lesson plans would be available to the teachers in the school system, enabling them to provide a wider breath of instruction.

Collaboration

Ash-Argyle and Shoham (2012) defined collaboration as a partnership of trust and of common goals, with all individuals sharing responsibility for the success of the project

(p.2). Bhargava (2010), Senteni and Tamim (2011), and Steck and Padget (2012) recommended collaborative learning for its ability to encourage the participants to appreciate and utilize the "competencies, skills and talents available in the group" (Senteni & Tamin, 2011, p. 984). Researchers found collaboration between teachers and a teacher librarian increased student learning (Cooper & Bray, 2011; Lamb & Johnson, 2011). Through collaboration, educators could enhance one another's skills and improve classroom pedagogy.

Purcell (2010) described the collaborative work of teacher librarians with classroom teachers as being "a vital element needed for vertical integration (i.e. between grade levels) of curriculum as well as horizontal integration (i.e., between subjects) of learning experiences" (p. 32). Collaboration between teachers and teacher librarians was valued by teachers for its ability to enhance learning for students (Bhargava, 2010; Cooper & Bray, 2011; Kramer and Diekman (2010), Loertscher & Diggs, 2009; Montiel-Overall and Jones, 2011). Through collaboration, teacher librarians and teachers provided effective instruction for students.

Regularly scheduled collaborative sessions of teacher librarians and classroom teachers enhanced student learning (Ash-Argyle & Shoham, 2012; Brown, Dotson, & Yontz, 2011; Lance et al., 2010; Loertscher & Diggs, 2009). Reporting on the 2009 Idaho School Library Impact Study, Lance et al. (2010) noted that in elementary and middle schools where classroom teachers initiated at least monthly collaborations with the teacher librarians, scores in language arts and reading were "3 to 7% higher--proportional differences of 14% to 21% over schools where librarians report[ed] less frequent teacher-

initiated collaboration" (2010, para. 19). Researchers recommended that school principals facilitate the presence of teacher librarians at grade level or subject level meetings (Bhargava, 2010; Montiel-Overall & Jones, 2011; Van Duesen, 1996). Administrative support would enable effective collaboration among teachers and teacher librarians, leading to enhanced student learning.

Ghislandi and Facci (2013) and Jwaifell and Gasaymeh (2013) contended that teachers wanted help in using the electronic whiteboard technology as part of their lesson plans. Hammond et al. (2013), Johnston (2012a), and Perez (2010) asserted that teachers needed the support that teacher librarians provided to help "weave technology, literacy, and research skills" (Steck & Padget, 2012, p. 34) into curricular goals. Montiel-Overall (2008) stressed the "iterative nature of collaboration…The more evident the effect on students, the greater the motivation [is] to collaborate" (p. 151). The collaborative work of the teachers and the teacher librarian would help in integrating technology into the classroom pedagogy.

Jacobs (2013) insisted that planning time for collaborative endeavors should be scheduled into the weekly schedules of the teachers and the teacher librarians. Researchers found that a collaborative environment facilitated a sharing of resources and lessons among educators in ways that eased workloads (Gadbois & Haverstock, 2012; Jwaifell & Gasaymeh, 2013; Lewin et al., 2009; Pritchard & Woollard, 2010). Montiel-Overall (2008) described teachers who believed that collaboration not only fostered students' learning, but also improved those teachers' pedagogical skills. DeMonte (2013) asserted that ongoing and school based collaborative professional development (para. 2)

would better prepare teachers to teach 21st century multi-literacies skills to their students (Girlando, 2013). Using collaborative learning to share resources would enable teacher librarians and other educators to teach the multi-literacies needed by students.

Implementation of the Project

Using the data collected and analyzed from this case study, I observed that some of the teacher librarians did not use interactive whiteboards to maximum advantage. This professional development project might teach more of the skills the educators of Laurel Falls School District need with interactive whiteboards, thus aiding in development of improved technological skills and multi-literacies skills in students and teachers. Working collaboratively, the classroom teachers and the teacher librarians would create a database of peer-reviewed interactive whiteboard lessons, aligned to the goals and missions of the schools and the school system. This repository of lesson plans could increase teachers' use of interactive whiteboards to teach technological and multi-literacies skills, and reduce the time needed to prepare for lessons.

Project Timeline

The professional development project would be composed of six half day sessions that would meet during the course of a three-day period, at each school in the Laurel Falls School District. There would be two sessions each day, with activities and large and small group discussions. Copies of the agenda, all handouts, and the PowerPoint presentation related to the professional development project are attached to Appendix A. Each session would last for three and a half hours to allow time for lunch in between the morning and afternoon sessions. The teacher librarian would present the project at the

school where that individual teaches. If the school board prefers, I could be the presenter, or copresenter for the first day at one of the schools, that is, assuming the professional development occurs at all of the schools on the same date.

To encourage attendance, Matteson (2013) recommended providing refreshments. Pastries and coffee, juice, and tea, could be available each morning to ensure prompt arrival of the participants. By offering sandwiches or salads for lunch, as well as water and snacks, the attendees would be persuaded to remain throughout the sessions (e.g., Matteson, 2013).

First Day

The presenter would begin Session one with an introduction of the topics to be addressed, including objectives of the workshop of advancing interactive whiteboard technology skills of the participants. Each participant would take a formative assessment of five multiple choice questions (Handout 1). A copy of handout A is attached to Appendix A. This will enable the presenter to benchmark the skills of the attendees. Based on the results of the assessment, training would be provided, at a beginner or intermediate level, on the affordances, or tools, of the interactive whiteboard. Handout 2 (Basic / Intermediate Interactive Whiteboard Training Materials) would be given to the participants. (See Appendix A for a copy of Handout 2).

Using small and large group discussions, the attendees would explore best practices with teaching with interactive whiteboards, the positive aspects of using interactive whiteboards, and how the technology helps teachers, or could help them, to teach more effectively. Other topics would include how to enhance multiple literacy

instruction, how to provide differentiated instruction, and how to encourage interactive whiteboard use throughout the school. Participants would discuss what additional interactive whiteboard applications they recommended. A brief summative assessment (Handout 3) would be completed by the attendees before breaking for lunch. A copy of Handout 3 is attached to Appendix A.

During session two, the participants would focus on creating technology rich lesson plans for interactive whiteboards. The presenter would provide each participant with copies of Handout 4 (Resources for Interactive Whiteboards), Handout 5 (Lesson Plan Websites), Handout 6 (Lesson Plan Template), and Handout 7 (Sample Lesson Plan**)**. Copies of Handouts 4-7 are attached to Appendix A.

The elements of an interactive whiteboard lesson plan would be discussed by the attendees, including Common Core and other standards. Depending upon the needs of each school, these standards may include Expeditionary Learning or International Baccalaureate standards as well. The elements needed for the lesson plan, as well as an estimate of the length of time needed to teach the lesson, would be listed by the participants. These elements would include the objectives, a lesson abstract, the standards addressed, key words, audience, lesson plan, and materials.

The teachers would divide into groups by either grade level or subject level. Using a sample social studies lesson plan (Handout 7), they would create a grade appropriate lesson plan, using Handouts 4 and 5 for additional online resources. The teachers would decide upon the projects their students would produce and how the projects would be assessed. Then in a large group discussion, the teachers would share

their lesson plans. The attendees will take the summative assessment (Handout 3). The teacher librarian will present a session wrap up and a question and answer period.

Second Day

Sessions 3 and 4 would focus on the creation of interactive whiteboard lesson plans. Before beginning session 3, all attendees would take the formative assessment (Handout 1). The teacher librarian and a fellow teacher would model how they collaboratively develop a lesson. Preferably, this will be a recapitulation of a collaboration the two individuals had done in the past. Using Handout 6 (the Collaborative Lesson Plan Template), they would discuss the roles that each of them would play and how best to present the lesson to the students. Kramer and Diekman (2010) found that when the teacher librarian and the teacher collaborated, the standards were met, and the lesson matched the pedagogical goals of the school.

In small group discussions, the teachers would share their ideas as to ways to create opportunities for collaboration with other teachers and with teacher librarians. The benefits of collaboration would be discussed and teachers could relate their own examples of successful collaborations. Using Handout 2 (Basic and Intermediate ActivBoard Training Materials), Handout 4 (Possible Resources for Interactive Whiteboards), and Handout 5 (Lesson Plan Websites), the teacher librarian and fellow teachers would create a tentative timetable, assigning each grade or subject level a different month in which to collaborate. A copy of Handout 5 is attached to Appendix A. The benefits of these collaborative processes could be documented. Along with the

tentative timetable, they could be used as a part of a deliverable from the workshop to the administration (Berkun, 2005).

Utilizing the interactive whiteboard lesson plan format the participants created in Session 3, each grade level or subject level would define a topic to be co-taught with the teacher librarian for that assigned month. Possible assessments to be used would be discussed, as well as potential products for students to make. These products would be based on the differentiated learning needs of the students. All participants will take the summative assessment (Handout 3) before breaking for lunch.

Session 4 would begin after lunch. In a large group discussion, the participants will discuss ways to help in the adoption and integration of technology into pedagogical goals. The teachers would consider how to develop technology advocates to be mentors and coaches to fellow teachers. In small group discussions, they would discuss the characteristics and skills needed to mentor colleagues in how to incorporate interactive whiteboards in their pedagogical goals. The participants would recommend the best individuals at their grade or subject level to be technology mentors for their grade or subject level. These mentors would act as the subject matter experts for technologies, such as interactive whiteboards, and for the creation of technology rich lesson plans. The presenter would give the recommendations for mentors to the administrators for consideration. The participants will take the summative assessment (Handout 3). The presenter will provide a session wrap up, including a question and answer period.

Third Day

During Sessions 5 and 6 the participants will develop a repository of technology based lesson plans to promote reuse throughout the school system. At the start of Session 5, all participants would take the formative assessment (Handout 1). In a large group discussion, participants will brainstorm as to what would constitute a repository of lesson plans for the Laurel Falls School District, based upon the mission and goals of the school system. This definition would define what content (e. g., lesson plans, standards, goals, and support material) would be provided in the repository and how teachers could use the content.

For example, a teacher might want additional lesson plans and resources for teaching the history of the Civil Rights movement in the United States. An ELL teacher needing additional resources on poetry might want to explore a variety of lessons on different grade levels for differentiated instruction. The presenter would display all suggestions from the participants on the interactive whiteboard, so they could be used in both sessions.

In order for the lessons plans to be incorporated into the repository, the participants will explore what elements, or metadata, should be present in all lesson plans for use by the teachers of Laurel Falls School District. Marco & Jennings (2004) recommended that all metadata be defined for any content published in the lesson plan repository. The metadata might include such components as author, title, date content was created, summary, objective(s), standards, keywords, technology used, and grade levels. Using Handout 6 (Lesson Plan Template), the teacher librarian and the classroom

teachers would discuss what metadata should be used to help in creating, storing, and accessing the lesson plans. These suggestions would be recorded on the interactive whiteboard to be used for Session 6. The participants would take the summative assessment (Handout 3) before breaking for lunch.

For Session 6, each participant would receive a copy of Handout 7 (Sample Lesson Plan) and Handout 8 (Samples of Lesson Plan Metadata). Copies of Handout 7 and Handout 8 are attached to Appendix A. The attendees would explore the characteristics of well-designed lesson plans. These characteristics could be used to formulate the metadata needed to create technology-rich lessons plans for the repository, available for all educators in the Laurel Falls School District.

Governance of the repository would ensure that the lesson plans submitted meet the standards of the Laurel Falls School District. The participants in the professional development could explore the responsibilities of the governance committee (PMI, 2013), such as determining which lesson plans would be submitted to the repository for reuse throughout the school system. Some of the topics to be addressed would be content review (with governance) of the lesson plans and the publishing of the lesson plans in the repository.

The Project Management Institute (PMI, 2013) recommended lifecycle governance to provide content review, to determine which lesson plans to keep; and content deletion, to determine which lesson plans to remove. For example, some topics for Expeditionary Learning, used in lower elementary, may not be used again by the school system and would need to be deleted at the end of each year. The development of

this process to follow the content lifecycle of the lesson plans could be explored by the participants.

Another area of discussion could be the creation of a charter of the repository (PMI, 2013). This document would define the scope of the repository, as well as staffing and management (PMI, 2013). The teachers could discuss several components of the charter, such as the mission statement and the identification of key sponsors and stakeholders (PMI, 2013, p. 67). For example, the sponsors might include the directors of elementary and secondary education, as well as the directors of special education, instructional technology, and library media services.

The participants could discuss the duties of the individual or individuals working with technology support to create and maintain the repository. Other duties could include those for individuals working with teachers providing lesson plans, to create and publish content. These items could be used to constitute a project charter for the development of the repository of lesson plans. All recommendations from the participants could be used for a deliverable to the administration of the school system.

At the end of the session, all participants will take the summative assessment (Handout 3). All data collected from the formative and summative assessments could be used for the preparation of future workshops.

Potential Resources and Existing Supports

Potential resources would include the use of a conference room or the media center of each school for the three days of professional development. The use of an

interactive whiteboard and laptops for the presenter and attendees will be required for the professional development project.

The school system's technical support is provided by the teacher librarians, school technicians, and support purchased through the supplying company of the interactive whiteboards. The most effective use of interactive whiteboards requires sufficient training and a variety of resources. The school system has a subscription to Promethean Planet, which provides flipcharts and lesson plans on a large number of subjects. The schools may have additional resources, including online databases such as EBSCO, Discovery Education, BrainPop, ProQuest SIRS, and online digital libraries, including TeachingBooks.net and TumbleBooks.com. Other supports include the school board for the Laurel Falls School District and the administration, as well as local learning communities within the school district, such as the support system that the director of instructional media and teacher librarians maintain amongst themselves and in their monthly meetings.

Potential Barriers

Potential barriers might include insufficient time for the collaborative professional development for the teacher librarians, as well as insufficient time for collaboration among teacher librarians and teachers (Lamb, 2011; Scoggins, 2010). Researchers asserted that professional development often tended to be too short and divorced from the participants' needs (Harris, 2011; Kenney, 2011; Loertscher, 2010; Meyer, 2013). Shattuck (2009), Manny-Ikan et al. (2011) and Yudt and Columba (2011) argued that teachers needed pedagogical and technological instruction in how to incorporate

technologies effectively into classroom practices. Providing time for collaboration and long term professional development would help in the adoption of interactive whiteboard technology by teachers.

Gregg (2007) found that teachers collaborated more frequently with those teacher librarians who regularly attended departmental or grade-level meetings (pp.26-27). This collaboration could provide "an understanding of the changes in pedagogy that [were] possible" (Jones & Vincent, 2010, pp.489-490). Researchers argued for support by the school principals for technology adoption and for professional development (Abuhmaid, 2014; Cooper & Bray, 2011; McLoughlin, 2012; Shattuck, 2010). This administrative support would ensure the active participation of all teachers in professional development activities (Kemp, 2010, p. 144). Allowing teacher librarians to attend grade level meetings, as well as flexible scheduling in the school library media center, would enable teachers and the teacher librarian to collaborate often.

Roles of the Student and the Participants

During this professional development project, teachers will have collegial and individualized collaborative time with the teacher librarians (Lambert, 2002; McLoughlin, 2012; Reeve & Church, 2013) and with their fellow teachers. This will afford teachers time to develop the collaborative strategies needed for their students (LaBombard, 2009, p. 164). I created the professional development plan for the project, the formative and summative evaluations, and the materials to be used in the project. I will act as a presenter of the project if the school system will allow. The teacher librarians will set up and lead the professional development at their individual schools. This

professional development may increase the technological skills of the educators of the Laurel Falls School District.

Project Evaluation

I chose technological and collaborative professional development for this project to aid the classroom teachers and teacher librarians in developing the skills they need as educators in the school system (Girlando, 2013; Kopcha, 2010; Polly & Hannafin, 2010; Reeve & Church, 2013; Troutner, 2012; Walker, 2013). Boone (2013) insisted that professional development should involve a constructivist approach, allowing participants to learn through interaction with others. Brown et al. (2011) and McLoughlin (2012) argued for professional development that provided "relevant, point-of-need instruction" (McLoughlin, 2012, p. 57), as it encouraged the participants to practice what they had learned. Gadbois & Haverstock (2012) and Abuhmaid (2014) contended that profession development should be related to the subjects that teachers taught. I used these recommendations in creating this professional development project to enhance the technological and collaborative skill of the teachers of the school system.

Using the recommendations of Davidson (2012), I based the evaluation plan for the project on the "intended goals and outcomes" (p. 75). The results from the formative assessment can be used to provide the groundwork for the technological professional development offered in the workshop on either a beginner or an intermediate level. The responses to the summative assessment can be analyzed to determine the effectiveness and perceived value of each session by the participants and to provide an opportunity for teachers to make recommendations for changes.

Goals of the Project

I based the goals of this project upon the need to improve technological and collaborative skills in the teacher librarians and teachers in the school system. Jacobs (2013) observed the necessity for both short term and long term goals. This project will have two immediate goals: (a) improving the technological and collaborative skills of teachers; and (b) creating a repository of lesson plans for all teachers and teacher librarians to use to teach students' the technological and multi-literacies skills they will need for future employment. Long term goals include (a) increasing skills of the educators in the school system in the use of interactive whiteboard activities, measured by an annual survey of skill and comfort level with technology; and (b) a recommended 20% growth in lesson plans added to the repository annually.

Brown et al. (2011), Essig (2011) and Abuhmaid (2014) recommended technological professional development for the effective use of interactive whiteboards in classrooms. Türel and Johnson (2012) insisted that educators needed to improve their "technology skills and positive attitudes through continued collaborative training and practice" (p. 392), thus increasing student learning. Jacobs (2013) argued that well executed professional development had the "potential to create an environment of meaningful learning that foster[ed] collaboration and promote[d] the sharing of knowledge and teaching strategies" (p. 101). Collaborative professional development among teacher librarians and teachers might improve student literacy and achievement, as well as the self-efficacy of teachers in the use of interactive whiteboard technology.

Formative and Summative Evaluations

Formative evaluation measures would be based on an evaluation of the participants' interactive whiteboard skills. This survey would be used to address the needs of the teacher librarians and the teachers in providing the technological training needed for the interactive whiteboard. Summative evaluation measures would be used to evaluate the effectiveness of each session in providing training that the participants might use in teaching. The data gathered from the surveys could be used to improve future professional development workshops..

Presentation to the Stakeholders

I will present the findings of my research, as well as a description of my professional development project, to the Laurel Falls School Board during one of their monthly meetings. I will have 5-7 minutes to present my case study and resulting project. The stakeholders might include the superintendent, the school board members, the director of media services, educators of the school system, the students and their parents, and members of the community (Machin, et al., 2009; Mills, 2010; Perez, 2010; Türel & Johnson, 2012).

Implications for Social Change

Local implications

Locally, the professional development for training in the use of interactive whiteboards for teachers in pedagogical goals might result in increased use of this technology to teach the 21st Century skills in media, information, print, and digital literacies. Increased collaboration among teacher librarians and teachers might result in

greater use of interactive whiteboards in all subject areas (Northcote et al., 2010, p.502). The project may highlight the contributions of the teacher librarians to increased student literacy, in their roles as the instructional and technological leaders in the school system.

Far-Reaching Implications

More effective use of interactive whiteboard technology may increase digital, print, media, and information literacy in students. As interactive whiteboards presented excellent formats for the teaching of these multi-literacies, students may be better prepared with 21st Century skills for college and for global marketplace careers (Matteson, 2013). The vital work of teacher librarians as collaborative, instructional, and technological leaders working with their classroom colleagues may be recognized by more school systems throughout the world.

Conclusion

This professional development project may increase the technological, pedagogical, and collaborative skills of teachers. Through collaboration, teacher librarians instruct students and teachers in multiple literacy skills, including information, print, media, and digital literacies. During this 3-day collaborative and technological professional development project, teachers will increase their collaborative skills and their interactive whiteboard skills to integrate technology effectively into their pedagogy. They will collaborate to create a repository of technology-rich lesson plans, available to all teachers in the school system. The participants will develop the characteristics, or metadata, that all repository lesson plans would contain. This metadata would enable

teachers to find needed materials easily from the repository. This metadata could be used in the creation of a charter for the lesson plan repository.

The participants would discuss the attributes needed by technology advocates. At their grade or subject level, these individuals would coach and mentor their fellow teachers, aiding them to improve their integration of technology into the classroom pedagogy. This professional development project may increase the technological and multi-literacies skills of the teachers and students in the school system.

Section 4: My Reflections

Introduction

Researchers (e.g., Chapman et al., 2011; Slama, 2012) asserted that students with insufficient skills in literacy often struggle in school, and may fail to graduate from high school. The use of interactive whiteboard in classroom pedagogy increased student achievement (Yang, Wang, & Kao, 2012) and engagement in classroom activities (Xu & Moloney, 2011). I used a case study methodology to investigate the experiences and perceptions of teacher librarians teaching with interactive whiteboards in library classrooms to determine the effectiveness of interactive whiteboards in the teaching of literacy. My analysis of the data indicated the teacher librarians believed the interactive whiteboards positively impacted students' engagement in the classroom and students' motivation to learn. They felt the interactive whiteboards aided in the teaching of multi-literacies. The teacher librarians taught fellow teachers how to use interactive whiteboard technology. The teacher librarians collaborated with classroom teachers to provide technological and pedagogical support in teaching multiple literacies, including print, digital, media, and information literacy.

Use of the interactive whiteboards enabled educators to provide students with an interface for interaction with computers and the Internet, allowing students to manipulate objects, to research topics, and to create digital media. Northcote et al. (2010), Winzenreid (2010), Jones et al. (2011), and Isman (2012) described the interactive whiteboard as an easy technology for pupils to learn. Interactive whiteboards are participative for large and small groups (Manny-Ikan et al., 2011; Somyürek et al., 2009),

unlike computers which tend to be more for individual use. Interactive whiteboard technology can allow educators to enhance their pedagogical goals (Hutchison, 2012), extending their reach to bring the world to the classroom environment. Teachers may need assistance with incorporating interactive whiteboards into the curriculum (Gadbois & Haverstock, 2012). Teacher librarians, by training, collaborate with fellow teachers to provide the assistance needed for effective instruction.

Using a case study design enabled me to understand and articulate the unique skills and contributions that teacher librarians bring to schools, including cross-curricular, technological, and multi-literacies skills. As the instructional and collaborative leaders in schools, teacher librarians provide professional development and coaching to their colleagues. They contribute to the educational goals of students, teachers, and administrators. Teacher librarians work to advance the goals and missions of their schools and school systems for the benefit of their communities. The findings of this case study aided me in the creation of a professional development project designed to increase the technological and multi-literacies skills of the teachers using interactive whiteboards to enhance instruction.

Strengths of the Project

The goal of this project was to increase teachers' technological and multiple literacies skills through enhanced use of interactive whiteboards in classroom pedagogy, thus increasing students' multi-literacies and technological skills. I designed a professional development workshop to expand the technological and collaborative skills of classroom teachers. The strengths of this project include the opportunities for

constructivist interaction among the participants, optimum use of the expertise of teacher librarians, and increased incorporation of technology and multi-literacies into the curriculum (Bhargava, 2010; Gadbois & Haverstock, 2012). Another strength is the creation of a repository of technology rich lesson plans for reuse (Biró, 2011; Dhindsa & Shahrizal-Emran, 2011; Lamb & Johnson, 2012; Kumar Bahadur & Oogarah, 2013; Manny-Ikan, et al., 2011) throughout the school district. Having access to these resources in a shared repository will enable teacher librarians and classroom teachers to incorporate interactive whiteboard technology more effectively into their pedagogical goals.

Recommendations for Remediation of Limitations

One of the limitations of the project could be insufficient time for the teacher librarians and other educators to meet for professional development (Hutchison, 2012; Sundberg et al., 2012). Another limitation could be a lack of administrative support (Shattuck, 2010). If teacher librarians do not have sufficient opportunities for scheduled collaborative activities with teachers, they may not be able to provide the technological and instructive support needed to make effective use of interactive whiteboards throughout the school system (Polly & Hannafin, 2010; Reeve & Church, 2013). These limitations could adversely affect effective use of technology by teachers in classroom pedagogy.

The interactive whiteboard is only one of a number of technologies now in used in the Laurel Falls School District. A series of ongoing collaborative professional development workshops would provide opportunities for teacher librarians and other educators to explore how to incorporate these technologies into the multi-literacies

curriculum that students will need for future employment. Neuman (2012) argued that students “must know how to use ever-changing digital technologies of all kinds to find and combine information in myriad and still-evolving ways” (pp. 26-27). These workshops would enable the educators in the school system to learn new ICT skills to teach to their students. Matteson (2013) recommended extending the timetable for the professional development to 2 months or more, meeting after school (p. 84). This would give the participants the time to incorporate the training into their curricular plans, and provide them opportunities to collaboratively discuss their pedagogical goals with their colleagues.

Scholarship

I have learned to critically analyze and synthesize the data retrieved through my research for this case study. I have learned to question the validity of resources discovered through the research, able to discern significant findings rather than opinions. I have endeavored to create a well-informed body of research to support the findings of my research and to create a project to help increase technological skills and multi-literacies skills for students and teachers.

I discovered the value of organization, storing research articles in files in cloud applications like Dropbox and Google Docs. With Microsoft OneNote, I separated my analysis of data gleamed from studies and dissertations into folders, with topical headings such as collaboration and multi-literacies. I learned to schedule my time wisely, taking advantage of the times when I felt most productive. Until I began this process, I did not

appreciate fully the scholarship and effort that goes into a dissertation. I have learned much in the past four years.

Project Development and Evaluation

I based the project upon the findings from my research. Information gleamed from the questionnaire and the focus group interview made me realized that although all of the participants were using the interactive whiteboards, only one of the teacher librarians regularly created flipcharts to be used in the library classroom. Two of the four felt comfortable using all of the tools provided with the interactive whiteboard software. Three of the teacher librarians reported collaborating with some of their fellow teachers. They expressed regret that time restraints made it difficult for them to collaborate more often with their fellow teachers. As researchers asserted that the use of interactive whiteboards for instruction increased student literacy (Chen & Tsai, 2013; Tay et al., 2012; Yang et al., 2012), I chose a collaborative and technological professional development project to help teachers use this technology effectively in the classroom

Using a constructivist environment, the teacher librarians and classroom teachers could work together to increase their interactive whiteboard skills and create a repository of technology based lesson plans to be reused throughout the school system. Summative assessments could be delivered after each session to determine how successful that session had been in teaching needed skills. These assessments could be used to guide future professional development workshops for educators.

Growth in Leadership

At the beginning of my second year at Walden University, the director of information and media services in my school system asked me to head the committee for all teacher librarian training programs and monthly meetings. Prior to this, our meetings frequently overran the time allotted and felt unproductive to the attendees. I created schedules for every program, and kept everyone on task. I requested feedback as to the types of training they wished to obtain, and used the information to schedule workshops. Using large and small group discussions, I formed collaborative endeavors to address issues, including the effective use of the Accelerated Reader program, and the training of students to participate in the state-wide reading bowl competition.

On one occasion, a grant writer from the school board of education came to help us write a grant. The teacher librarians wanted to table the process for another time. I quickly organized everyone into four small groups. Each group was asked to brainstorm three different questions. Fifteen minutes later, the grant writer left, with all the information needed to secure the grant for us. We received the grant, thanks to everyone's hard work. Until that time, I had not realized how the training in leadership that I received at Walden University had helped me.

Analysis of Self as Scholar

As a teacher librarian, I have always enjoyed doing research. I have learned the skills to analyze and synthesize that research. Using Microsoft OneNote, I formulated categories to compare and contrast the studies on professional development, interactive whiteboards, collaboration, and academic language. I began to see the connection

between effective uses of interactive whiteboards to increase student literacy and student success on state mandated testing, especially with regards to the acquisition of academic language.

A year ago, an opportunity opened up to write a chapter for a book on collaboration between teachers and librarians. That book, *Collaborative Models for Teacher and Librarian Partnerships*, edited by K. Kennedy and L. S. Green, was published in 2014, by IGI Global Publishers, and mine is the fourth chapter. I hope this will be the beginning of many more research endeavors.

Analysis of Self as Practitioner

During my first year at Walden University, I recognized that I collaborated more frequently with classroom teachers. I could quickly access what was needed to facilitate the learning process for students. I began a journal, reflecting upon my daily experiences teaching students multiple literacies skills in the library classroom. My lesson plans became more creative so that I could meet the multiple learning needs of my students.

I met more frequently with fellow teachers and librarians to develop new understandings of teaching with interactive whiteboard technology. For example, I used a flipchart that I had downloaded from Promethean Planet to teach map skills. From my research on the effective use of interactive whiteboard technology in the classroom, I recognized my students' need for different perspectives. I incorporated Google Maps into the lesson to show the students a bird's eye view of their school and the surrounding area. That interactive exercise with the pen naturally led to the second segment of that lesson, using maps and atlases.

Many of these students had never traveled beyond a local town. They had never been to a shopping mall, much less another state. After the lesson where they saw a satellite view of their school and local neighborhoods, I laid out paper maps of their city and of their state on the library tables, and watched as they gleefully traced where their homes were in relation to the school, the state capital, and even our nation's capital. I watched them use atlases, helping each other to use longitude and latitude to find cities around the world. The students enjoyed the map lesson so much that they asked to repeat it. The research needed for this case study helped me to make this and other pedagogical changes.

Analysis of Self as Project Developer

A key lesson that I learned from my Walden University experience was how to pull together people's insights, creativity, energy, and enthusiasm to provide unique and powerful approaches to dealing with the challenges of the educational process. I learned that a project developer must respect the current processes in place at the school system in order to provide opportunities for professional growth. In a successfully executed project, Zepeda (2008) insisted that "all stakeholders are valued, collaboration is the norm, learning occurs naturally, and reflection is fostered through collegial conversations" (as cited in LaBombard, 2009, p. 84). The project developer needs to encourage these trusting relationships with the stakeholders for effective change to occur.

Educators need opportunities to create their own communities of practice within their grade level or subject areas, providing one another with the support needed to change pedagogical approaches (Cox, 2005; Gruber, 2011; Hammond et al., 2013;

Hutchison, 2012). Boone (2013) asserted that the project must provide hands-on learning that is meaningful and beneficial (p. 30). McLoughlin (2012) insisted that "teachers need and want to have a voice in what is presented during professional development and need to learn and share activities that increase students' learning" (p. 64). Too often outside resources are brought in to provide project development, without incorporating the valued insights and knowledge of the educators in the school system (Jacobs, 2013; Kemp, 2010; LaBombard, 2009). Professional development workshops should provide collaborative, technical, and pedagogical training that is meaningful and beneficial (Boone, 2013; Hutchison, 2012; McLoughlin, 2012). Having collaborative opportunities to investigate new pedagogical practices with fellow teachers encourages teachers to adopt these changes into their classroom instruction.

DeMonte (2013) recommended that professional development to be a minimum of 14 hours in length, as "it takes sustained investment of time into teacher training to change instruction and improve classroom outcomes" (para. 2). For effective improvement in student learning, professional development programs should to be long term and integral to the curricular calendar (DeMonte, 2013; Hutchison, 2012). The programs should include scheduled opportunities for teachers to observe and mentor one another as they explore and institute new practices (Gadbois & Haverstock, 2012; Hutchison, 2012; Jacobs, 2013; Meyer, 2013). Thus, a successful project should be ongoing and long term, to allow teachers time to integrate what they have learned into their pedagogical goals.

As a project developer, I have learned how to incorporate democratic, functional, and engaging design elements into a team oriented professional development model (DeMonte, 2013; McLoughlin, 2012; Meyer, 2013). These design elements included participant-led small and large group discussions with follow up assessments to find opportunities for professional growth (Lewin, 2007; PMI, 2013; Shattuck, 2010). I have learned to schedule time for active learning by the participants (Boone, 2013). My research has helped me to become a better project developer, incorporating necessary changes into my designs.

The Project's Potential Impact on Social Change

I envision this project would enable students, parents, teachers, administrators and other stakeholders to view the library classroom as a place of equitable access and democratic learning. As defined by the Center for Media Literacy, "Media Literacy is a 21st century approach to education…[that]…builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy" (2001, para. 3). Through the teaching of multiple literacies, teacher librarians work to provide their students with "equitable opportunities to learn, participate in society, and further social change" (Trujillo & Renée, 2013, p.56). They are the leaders in schools, both instructionally and technologically (Kachel & Lance, 2013).

The current trend in education toward greater use of technology in instruction, collaborative global learning, and worldwide commerce pinpoint the need for equitable instruction so that students will be prepared for the global technological workplace. It is

our role, as scholar-practitioners, to create social change in our schools, our communities, and our world.

This case study examined the experiences and perceptions of four teacher librarians using interactive whiteboard technology to teach information, digital, and media literacy to both students and teachers. These teacher librarians in this case study were "child-centered" (Montiel-Overall, 2008, p.150) with their focus on the successes of their students (Kitchenham, 2006, p. 215). At a time when school districts are eliminating positions, the role of the teacher librarian is at risk (Nelson, 2011). Like administrators, teacher librarians see the totality of their schools, and all the components and resources that are needed for students and teachers to succeed. Teacher librarians view themselves as "a self-reflective school library community of practice motivated by self-improvement as well as the improvement of society" (Gordon, 2010, p.1). Teacher librarians are the ones best positioned to help their fellow educators to achieve equitable learning for students.

November (2012) and Wilson (2012) argued that students needed print, digital, and media literacy to be "able to analyze and assess the information and representations about our world" (Wilson, 2012, para. 6). Purcell (2010) affirmed that school libraries function as "the hub of the learning community" (p. 30), providing teachers with the tools and resources they need and helping students to learn (Kachel & Lance, 2013; Wilson, 2012). Teacher librarians instruct students and teachers in the use of technologies and software (Wilson, 2012). They teach print, digital, information, and media literacy, including how to locate, organize, and analyze data to produce information in different

formats (Hamilton, 2012; Wilson, 2012). My research on the use of interactive whiteboard technology by teacher librarians demonstrates the vital role the teacher librarians play in teaching literacy to students, through the effective use of technology in classroom pedagogy.

Implications, Applications, and Directions for Future Research

An implication of the professional development workshop may be that the teachers will incorporate interactive whiteboard technology into their pedagogical goals more often. This technology would enable them to teach the multi-literacies needed by students in higher education and in the global economy. Through collaboration, teacher librarians and teachers could integrate these technological skills more effectively into their classroom pedagogies. The repository of technology rich lesson plans could be shared with fellow educators in the school district, helping teachers to embed 21st Century multi-literacies skills into classroom activities.

This professional development workshop could be used in any school system wanting to incorporate interactive whiteboard technology into the curriculum. Through constructivist collaboration, the educators would learn how to use the tools of the interactive whiteboard, and of other technologies. These skills would help to engage students in classroom activities, and aid in increasing literacy in students. This workshop could be offered over throughout the year, using mentors and communities of practice to reinforce skills learned.

Directions for future research could include a follow-up study on teachers to determine the effectiveness of the repository of lesson plans. Research could be

conducted to determine whether teaching with interactive whiteboards improved students' abilities to use interactive whiteboards and other technologies, particularly in terms of using technology to share and display knowledge learned with others (AASL, 2010). Researchers could examine the effect of more frequent collaborations among teacher librarians and their fellow teachers in terms of student academic achievement. Future research may be focused on how teacher librarians integrate other technologies with interactive whiteboards, and how they use social media to collaborate and to teach multi-literacies (Kenney, 2011; Hamilton, 2012).

Conclusion

I used the case study methodology to examine the use of interactive whiteboard technology by the teacher librarians of a school system in the United States to teach literacy. Using a questionnaire and a focus group interview, I explored how the four participants utilized interactive whiteboard technology, including their perceptions of the benefits and limitations of teaching with interactive whiteboards in the library classroom. The teacher librarians described collaborating with teachers. They taught multi-literacies and technological skills to students and teachers. Researchers highlighted the critical role that teacher librarians played in student motivation and academic achievement (Francis & Lance, 2011; Latham, Gross, & Witte, 2013; Moreillon, 2013; Small et al., 2010). As technological and instructional leaders, they provide teachers technological and pedagogical support for the integration of interactive whiteboards in classroom activities throughout the school system. Teacher librarians contribute to student literacy, thus

enhancing the work of schools in preparing students for future employment with 21st Century skills in multi-literacies and technologies.

References

Abuhmaid, A. (2014). Teachers' Perspectives on interactive whiteboards as instructional tools in four Jordanian schools. *Contemporary Educational Technology, 5*(1), 73-89. Retrieved from www.cedtech.netI

Allsopp, D. H., Colucci, K., Doone, E., Perez, L., & Holfeld, T. (2012). Interactive whiteboard technology for students with disabilities: A year long exploratory study. *Journal of Special Education Technology, 27*(4), 1-15. Retrieved from http://eric.ed.gov/

Alvermann, D. E., & Wilson, A. A. (2011). Comprehension strategy instruction for multimodal texts in science. *Theory into Practice, 50* (2), 116-124. doi:10.1080/00405841.2011.558436

American Association of School Librarians. (2008). *AASL Standards for the 21st Century Learner*. Retrieved from http://www.ala.org/aasl/standards-guidelines/learning-standards

American Association of School Librarians. (2010). *AASL Comments of the National 2010 Technology Plan: Submitted by Letter to Secretary of Education Arne Duncan.* Retrieved from http://www.ala.org/aasl/advocacy/resources/position-statements/netp-2010

Andrew, D., & Lewis, M. (2004). Building sustainable futures: emerging understandings of the significant contribution of the professional learning community. *Improving Schools, 7*(2), 129-150. doi:10.1177/1365480204047345.

Armstrong, V., Barnes, S., Sutherland, R., Curran, S. Mills, S., & Thompson, I. (2005).

Collaborative research methodology for investigation teaching and learning: The use of interactive whiteboard technology. *Educational Review, 57*(4), 455-467. doi:10.1080/00131910500279551

Ash-Argyle, R., & Shoham, S. (2012). Librarians' leadership efficacy, training, and school involvement: Collaboration between teachers and school librarians in Israel. *School Libraries Worldwide, 18,* (1), 1-17. Retrieved from http://www.iasl-online.org/pubs/slw/jan2012.htm

Asselin, M., & Doiron, R. (2008). Towards a transformative pedagogy for school libraries 2.0. *School Libraries Worldwide, 14*(2), 1-18. Retrieved from http://www.iasl-online.org/pubs/slw/july08.htm

Bay, E., Bagceci, B., & Cetin, B. (2012). The effects of social constructivist approach on the learners' problem solving and metacognitive levels. *Journal of Social Sciences, 8*(3), 343-349. Retrieved from http://thescipub.com/jss.toc

Beauchamp, G., & Parkinson, J. (2005). Beyond the "wow" factor: Developing interactivity with the interactive whiteboards. *School Science Review, 86*(316), 97-103. Retrieved from http://www.ase.org.uk/journals/school-science-review/

Beauchamp, G., & Kennewell, S. (2010). Interactivity in the classroom and its impact on learning. *Computers & Education, 54*(3), 759-766. doi:10.1016/j.compedu. 2009.09.033

Beeland, W. (2002). *Student Engagement, Visual Learning and Technology: Can Interactive Whiteboards Help?* Retrieved from http://chiron.valdosta.edu/are/

Bélisle, C. (2006). Literacy and the digital knowledge revolution. In A. Martin & D.

Madigan (Eds.). *Digital Literacies for Learning*. London, GB: Facet.

Bell, M.A. (1998). *Survey of Use of Interactive Electronic Whiteboard in Instruction.* Retrieved from http://www.shsu.edu/~lis_mah/documents/surveymain.htm

Bell, M.A. (2001). *Update to Survey of Use of Interactive Electronic Whiteboard in Instruction*. Retrieved from http://www.shsu.edu/~lis_mah/documents/updateboardindex.htm

Berkun, S. (2005). *The Art of Project Management.* Sebastopol, CA: O'Reilly Media.

Bhargava, M. (2010). *Teachers-Librarian Collaboration in Building the Curriculum for an IB World School: A Case Study*. Proceeding of the 12th Biennial School Library Association. Queensland, Australia. Retrieved from http://eric.ed.gov/

Biró, P. (2011). Students and the interactive whiteboard. *Acta Didactica Napocensia, 4*(2/3), 29-38. Retrieved from http://adn.teaching.ro/

Biró, P. (2012). Interactive whiteboard in mathematics education. *Acta Universitatis Sapientiae. Social Analysis, 2*(10), 111-127. Retrieved from http://www.acta.sapientia.ro/acta-social/social-main.htm

Blurton, C. (1996). New directions of ICT-use in education. *UNESCO's World Communication and Information Report 1996.* Retrieved from http://www.unesco.org/education/

Boone, T. (2013). *Multiple Measures Regarding the Competence of the Andragogical Learner.* (Doctoral dissertation). Walden University. Retrieved from ProQuest Dissertations & Theses Full Text database. (UMI No. 3554531).

Bray, M., & Hollandsworth, R. (2011). School library media specialists: What's in a

name? A lot it seems. *TechTrends, 55*(4), 19-20. doi:10.1007/s11528-011-0507-7

Branscombe, N.A., Castle, K., Dorsey, A.G., Surbeck, E., & Taylor, J.B. (2003). *Early Childhood Curriculum: A Constructivist Perspective.* New York, NY: Houghton Mifflin.

Brewer, S., & Milan, P. (2006). SLJ's technology survey 2006. *School Library Journal, 52*(6), 46-50. Retrieved from http://schoollibraryjournal.com/slj/

Brown, C. A., Dotson, L. K., & Yontz, E. (2011). Professional development for school library media professionals: Elements for success. *TechTrends, 55*(4), 56-62. doi:10.1007/s11528-011-0512-x

Bylund, J. (2011). Thought and second language: A Vygotskian framework for understanding BICS and CALP. *Communiqué, 39*(5), 4-6. Retrieved from http://eric.ed.edu/

Callahan, S., Schenk, M., & White, N. (2008). *Building a Collaborative Workplace*. Retrieved from http://www.anecdote.au/

Canter, L., Voytecki, K., Zambone, A., & Jones, J. (2011). School librarians: Forgotten partners. *Teaching Exceptional Children, 43*(3), 14-20. Retrieved from http://eric.ed.gov/

Carnahan, C. R., Williamson, P. S., Hollingshead, A., & Israel, M. (2012). Using technology to support balanced literacy for students with significant disabilities. *Teaching Exceptional Children, 45*(1), 20-29. Retrieved from http://journals.cec.sped.org/tec/

Carter, A. (2002). Using interactive whiteboards with deaf children. *Birmingham Grid for*

Learning. Retrieved from http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/teacher/ict/whiteboards/index.htm

Center for Media Literacy (2001). *Media literacy: A Definition and More*. Retrieved from http://www.medialit.org/media-literacy-definition-and-more

Cervetti, G., Damico, J., & Pearson, P. D. (2006). Multiple literacies, new literacies, and teacher education. *Theory into Practice, 45*(4), 378-386. doi:10.1207/s15430421tip4504_12

Chapman, C., Laird, J. Ifill, N. & KewalRamani, A. (2011). Trends in High School Dropout and Completion Rates in the United States: 1972-2009 (NCES 2012-006). U.S. Department of Education. Washington, D.C.: National Center for Education Statistics. Retrieved from http://eric.ed.gov/

Chau, M. (2008). *Connecting Learning Styles and Multiple Intelligence Theories Through Learning Strategies: An Online Tutorial for Library Instruction.* Retrieved from http://libres.curtin.edu.au/libres16n1/

Chen, S.-H., & Tsai, M.-Y. (2013). Using the interactive whiteboards to teach picture books: The case of Taiwan. *International Education Studies, 6*(11), 86-93. doi:10.5539/ies.v6n11p86

Clemmitt, M. (2008). Reading crisis? Do today's youth read less than past generations? *CQ Researcher, 18*(8), 169-192. Retrieved from http://www.cqresearcher.com

Cogill, J. (2003). *How Is the Interactive Whiteboard Being Used in Primary Schools and How Does This Affect Teachers and Teaching?* Retrieved from http://www.virtuallearning.org.uk/

Common Core State Standards Initiative. (2010). *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects.* Washington, DC: National Governors Association Center for Best Practices. Retrieved from http://eric.ed.gov/

Conrad, R. M., & Donaldson, A. (2011). *Engaging the Online Learner: Activities and Resources for Creative Instruction*. San Francisco, CA: Jossey-Bass.

Cope, B., & Kalantzis, M. (2007). New media, new learning. *International Journal of Learning, 14*(1), 75-79. Retrieved from http://ijl.cgpublisher.com/product/pub.30/prod.1298

Cope, B., & Kalantzis, M. (2009). "Multi-literacies": New media, new learning. *Pedagogies: An International Journal, 4* (3), 164-195. doi:10.1080/15544800903076044

Cox, A. M. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science, 31*(6), 527-540. doi:10.1177/0165551505057016

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (2nd Ed.).* Thousand Oaks, CA: Sage.

Creswell, J.W. (2007). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches (2nd Ed.).*Thousand Oaks, CA: Sage.

Crippen, K. J., & Archambault, L. (2012). Scaffolded inquiry-based instructions with technology: A signature pedagogy for STEM education. *Computers in the Schools, 29*(1), 157-173. doi:10.1080/07380569.2012.658733

Crook, C., Harrison, C., Farrington-Flint, L., Tomas, C., & Underwood, J. (2010). The Impact of Technology: Value-Added Classroom Practice. Coventry, UK: British Educational Communications and Technology Agency (BECTA). Retrieved from http://oro.open.ac.uk/

Cuthell, J.P. (2006). Ms. Chips and her battle against the cyborgs: Embedding ICT in educational practice. In O'Murchu, D. & Sorensen, E. (2006). *Enhancing Learning Through Technology.* Hershey, PA: Information Science.

Cuthell, J. (2010). Classroom as crucible and catalyst: Case studies in pedagogy and praxis, developing and supporting visual learning. In *Society for Information Technology & Teacher Education International Conference* (Vol. 2010, No. 1, pp. 1406-1411). Retrieved from http://www.editlib.org/j/EDMEDIA.

Dana, N.F., & Yendol-Silva, D. (2003). *The Reflective Educator's Guide to Classroom Research: Learning to Teach and Teaching to Learn Through Practitioner Inquiry.* Thousand Oaks, CA: Corwin.

Davidson, L. Y. J. (2012). *Teachers' perspective on using technology as an instructional tool.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3548902).

Deaney, R., Chapman, A., & Hennessy, S. (2009). A case study of one teacher's use of an interactive whiteboard system to support knowledge co-construction in the history classroom. *Curriculum Journal, 20(*4), 365-387. doi:10.1080/0958 5170903424898

Dees, D., Mayer, A., Morin, H., & Willis, E. (2010). Librarians as leaders in professional

learning communities through technology, literacy, and collaboration. *Library Media Connection, 29*(2), 10-13. Retrieved from http://eric.ed.gov/

DeMonte, J. (2013). *High quality professional development for teachers: Supporting teacher training to improve student learning.* Center for American Progress. Retrieved from https://www.americanprogress.org/

Desai, S., Freeland, M., & Frierson, E. (2007). Lesson study in libraries: Building better lessons, better teachers, and better teams with creativity, collaboration, and revision. *College of Research Libraries News, 68*(5), 290-293. Retrieved from: crln.acrl.org//content/68/5/290.

DeSantis, J. (2012). Getting the most for your interactive whiteboard investment: Three guiding principles for designing effective professional development. *Clearing House, 85,* 51-55. doi:101080/00098655.2011.607867

Digregorio, P., & Sobel-Lojeski, K. (2010). The effects of interactive whiteboards on student performance and learning: A literature review. *Journal of Educational Technology Systems, 38*(3), 255-312. doi:10.2190/ET.38.3.b

Dilshad, R. M., & Latif, M. I. (2013). Focus group interview as a tool for qualitative research: An analysis. *Pakistan Journal of Social Sciences, 33*(1), 191-198. Retrieved from http://thescipub.com/jss.toc

Dixon-Krauss, L. (1996). *Vygotsky in the Classroom: Mediated Literacy Instruction and Assessment.* White Plains, NY: Longman Publishers.

Donham, J. (2011). Assignments worth doing. *School Library Monthly, 28*(2), 5-7. Retrieved from http://eric.ed.gov/

Duncan, A. (2010, October 9) *Transcript: A conversation with Arne Duncan, U.S. Secretary of Education.* Council on Foreign Relations. Retrieved from http://www.cfr.org/publication/23187/conversation_with_arne_duncan_us_secretary_of_education.html

Earl, L. M. (2007). Assessment as learning. In Hawley, W.D. (Ed.), *The Keys to Effective Schools: Educational Reform As Continuous Improvement.* Thousand Oaks, CA: Sage.

Emanuel, J. (2013). Digital native librarians, technology skills, and their relationship with technology. *Information Technology and Libraries, 32*(3), 20-33. Retrieved from http://journals.bc.edu/ojs/index.php/ital

Essig, D. (2011). *A Case Study of Interactive Whiteboard Professional Development for Elementary Mathematics Teachers*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3450045).

European Schoolnet (2011). *Interactive Whiteboard Procurement Guidelines Report.* Retrieved from http://www.europeanschoolnet.org

Everhart, N. (2007). Leadership: School library media specialists as effective school leaders. *Knowledge Quest, 35*(4), 54-57. Retrieved from http://aasl.metapress.com/content/g14102816022ut35/

Everhart, N., Mardis, M. A., & Johnston, M. (2010). *The Leadership Role of the Teacher Librarian in Technology Integration: Early Results of a Survey of Highly Certified Teacher Librarians in the United States.* Paper presented at the International Association of School Librarianship conference. Brisbane, Australia.

Retrieved from http://eric.ed.gov/

Francis, B., & Lance, K. (2011). The impact of library media specialists on students and how it is valued by administrators and teachers: Findings from the latest studies in Colorado and Idaho. *TechTrends, 55*(4), 63-69. doi:10.1007/s11528-011-0513-9

Gadbois, S. A., & Haverstock, N. (2012). Middle years science teachers voice their first experiences with interactive whiteboard technology. *Canadian Journal of Science, Mathematics and Technology Education, 12*(1), 121-135. doi:10.1080/14926156.2012.649053

Gatlin, M. (2007). *The Impact of the Interactive Whiteboard on Student Achievement*. (Doctoral dissertation). Athens, GA: University of Georgia. Retrieved from http://athenaeum.libs.uga.edu/

Gee, J.P. (2007). *What Video Games Have to Teach Us About Learning and Literacy.* New York, NY: Palgrave MacMillan.

Geer, R., & Sweeney, T. (2012). Students' voices about learning with technology. *Journal of Social Science, 8*(2), 294-303. doi:10.3844/ jssp.2012.294.303

Ghislandi, P., & Facci, M. (2013). Schools in the Digital Age: Teachers' training role in the innovative use of the interactive whiteboard. *Ricerche di Pedagogia e Didattica, 1,* 61-79. Retrieved from http://rpd.unibo.it/

Gill, S. R., & Islam, C. (2011). Shared reading goes high-tech. *The Reading Teacher, 65*(3), 224-227. doi:10.1002/TRTR.01028

Gillen, J., Staarman, J. K., Littleton, K., Mercer, N., & Twiner, A. (2007). A "learning revolution?" Investigating pedagogic practice around interactive whiteboards in

British primary classrooms. *Learning, Media, and Technology, 32*(3), 243-256. doi:10.1080/17439880701511099

Girlando, G. (2013). *Making the Shift from Traditional Teaching to 21st Century Teaching*. (Doctoral dissertation). Walden University. Retrieved from ProQuest Dissertations & Theses Text database. (UMI No.3604718).

Glover, D., & Miller, D. (2001). Running with technology: The pedagogic impact of the large-scale introduction of interactive whiteboards in one secondary school *Technology, Pedagogy and Education, 10*(3), 257-278. doi:10.1080/ 174398807015110099

Gordon, C.A. (2010). The culture of inquiry in school libraries. *School Libraries Worldwide, 16*(1), 73-88. Retrieved from http://www.iasl-online.org/pubs/slw/jan2010.htm/

Grieffenhagen, C. (2000). *Out of the Office into the School: Electronic Whiteboards for Education.* Retrieved from https://www.academia.edu/

Gruber, B. (2011). *A Case Study of an Interactive Whiteboard District-Wide Technology Initiative into Middle School Classrooms*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3455562).

Haldane, M. (2007). Interactivity and the digital whiteboard: Weaving the fabric of learning. *Learning, Media and Technology, 32*(3), 257-270. doi:10.1080/ 17439880701511107

Hamilton, B. J. (2011). The school librarian as teacher: What kind of teacher are you? *Knowledge Quest, 39*(5), 34-40. Retrieved from http://aasl.metapress.com/

content/g162w1v268755694/

Hamilton, B. J. (2012). Embedded librarianship in a high school library. *Library Technology Reports, 48*(2), 21-26. doi:10.5860/ltr.48n1

Harlow, A., Cowie, B., & Heazlewood, M. (2010). Keeping in touch with learning: The use of an interactive whiteboard in the junior school. *Technology, Pedagogy, and Education, 19*(2), 237-243. doi:10.1080/1475939X.2010.491234

Harris, F. (2011). The school librarian as information specialist: A vibrant species. *Knowledge Quest, 39*(5), 28-32. Retrieved from http://aasl.Metapress.com/

Hatch, J.A. (2002). *Doing Qualitative Research in Education Settings*. Albany, NY: State University of New York Press.

Hawley, W.D. (Ed.). (2007). *Keys to Effective Schools: Educational Reform as Continuous Improvement.* Thousand Oaks, CA: Sage.

Heider, K. L. (2009). Information literacy: The missing link in early childhood education. *Early Childhood Education, 36*(2), 513-518. doi:10. 1007/s10643-009-0313-4

Hennessey, S., Deaney, R., Ruthven, K., & Winterbottom, M. (2007). Pedagogical strategies for using the interactive whiteboard to foster learner participation in school science. *Learning, Media and Technology, 32*(3), 283-301. doi:10.1080/17439880701511131

Hennessey, S. (2011). The role of digital artefacts on the interactive whiteboard in supporting classroom dialogue. *Journal of Computer-Assisted-Learning, 27*(6), 463-489. doi:10.1111/j.1365-2729.2011.00416.x

Herrington, J., & Kervin, L. (2007). Authentic learning supported by technology: Ten

suggestions and cases of integration in classrooms. *Educational Media International, 44*(3), 219-236. Retrieved from http://eric.ed.gov/

Hill, K.D. (2014). A second grade teacher's innovations toward multimodal literacies in an urban primary school. *Language & Literacy: A Canadian Educational E-Journal, 16*(1), 21-33. Retrieved from http://ejournals.library.ualberta.ca/

Hillier, E., Beauchamp, G., & Whyte, S. (2013). A study of self-efficacy in the use of interactive whiteboards across educational settings: A European perspective forms the iTILT project. *Educational Futures, 5*(2), 3-22. Retrieved from http://www.educationfutures.com/tag/journal/

Hobbs, R. (2010). *Digital and Media Literacy: A Plan of Action. A White Paper on the Digital and Media Literacy Recommendations of the Knight Commission on the Information Needs of Communities in a Democracy.* Washington, D.C.: Aspen Institute Communications and Society Program. Retrieved from http://www.knightcomm.org/

Hockly, N. (2013). Interactive whiteboards: Technology for the language teacher. *English Language Teachers Journal, 76*(3), 354-358. doi:10.1093/elt/cct021

Hodge, S., & Anderson, B. (2007). Teaching and learning with an interactive whiteboard: A teacher's journey. *Learning, Media, and Technology, 32*(3), 271–282. doi:10.1080/17439880701511123

Hsu, S. (2010). Developing a scale for teacher integration of information and communication technology in grades 1-9. *Journal of Computer Assisted Learning, 26*(1)175-189. doi:10.1111/j.1365-2729.2010.00348

Hur, J. W. & Suh, S. (2012). Making learning active with interactive whiteboards, podcasts, and digital storytelling in ELL classrooms. *Computers in the Schools, 29*(4), 320-328. doi:10.1080/07380569.2012.734275

Hutchison, A. (2012). Literacy teachers' perceptions of professional development that increases integration of technology into literacy instruction. *Technology, Pedagogy and Education, 21*(1), 37-56. doi:10:1080/1475939X.2012.659894

Hwang, G., Wu, C., & Kuo, F. (2013). Effects of touch technology-based concept mapping on students' learning attitudes and perceptions. *Educational Technology & Society, 16*(3), 274-285. Retrieved from http://www.ifets.info

International Society for Technology in Education.(2012). *ISTE: Digital Age Learning.* Retrieved from http://www.iste.org/standards/standards-for-students

Ishtaiwa, F. F., & Shana, Z. (2012). The use of interactive whiteboards by preservice teachers to enhance Arabic language teaching and learning. *Learning and Teaching in Higher Education: Gulf Perspectives, 8*(2), 1-18. Retrieved from http://www.ithe.zu.ac.ae/

Isman, A., Abanmy, F., Hussein, H., & Al Saadany, M. (2012). Saudi secondary school teachers' attitudes towards using interactive whiteboard in classrooms. *Turkish Online Journal of Educational Technology, 11*(3), 286-296. Retrieved from http://www.tojet.net/

Jacobs, L. (2013). *Teacher perceptions on the effect of collaboration on student achievement.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3549997).

Jang, S.,& Tsai, M. (2012). Reasons for using or not using interactive whiteboards: Perspectives of Taiwanese elementary mathematics and science teachers. *Australasian Journal of Educational Technology, 28*(8), 1451-1465. Retrieved from http://eric.ed.gov/

Jewitt, C. (2008). Multimodality and literacy in school classrooms. *Review of Research in Education, 32*(1), 241-267. doi:10.3102/0091732x07310586

Jewitt, C., & Kress, G. (2010). Multimodality, literacy and school English. In D. Wyse, R. Andrews, & J. Hoffman (Eds.), *The Routledge International Handbook of English Language Literacy and Teaching* (pp.342-366). New York, NY: Routledge.

Jewitt, C., Moss, G. & Cardini, A. (2007). Pace, interactivity and multimodality in teachers' design of texts for interactive whiteboards in the secondary school classroom. *Learning, Media and Technology, 32*(3), 303-317. doi:10.1080/ 17439880701511149

Johns, S. (2008). What can teacher librarians do to promote their work and the school library media program? Offensive formula: P+M=A. *Teacher Librarian, 36*(2), 30-31. Retrieved from http://www.teacherlibrarian.com

Johnson, S. L. (2011). *Effectively Using Presentation Technology in the History Classroom*. (Doctoral dissertation). Walden University. Retrieved from ProQuest database. (UMI No. 3460697).

Johnston, M. P. (2012a). Connecting teacher librarians for technology integration leadership. *School Libraries Worldwide, 18*(1), 18-33. Retrieved from

http://www.teacherlibrarian.com

Johnston, M.P. (2012b). School librarians as school technology integration leaders: Enablers and barriers to leadership enactment. *School Library Research, 15*. Retrieved from http://www.ala.org/aasl/

Jones, A., & Vincent, J. (2010). Collegial mentoring for effective whole school professional development in the use of IWB technologies. *Australasian Journal of Educational Technology, 26*(4), 477-493. Retrieved from http://www.ascilite.org.au/ajet/

Jones, P., Kervin, L., & McIntosh, S. (2011). The interactive whiteboard: Tool and/or agent of semiotic mediation. *Australian Journal of Language & Literacy, 34*(1), 38-60. Retrieved from http://www.alea.edu.au/resources/australian-journal-of-language-and-literacy-ajll

Jong, M. C., Kourtzi, Z., & Ee, R. (2012). Perceptual experience modulates cortical circuits in visual awareness. *European Journal of Neuroscience, 36*(12), 3718-3731. doi:10.1111/ejn.12005

Jurkowski, O. (2006). *Technology and the School Library: A Comprehensive Guide for Media Specialists and Other Educators*. Lanham, MD: Scarecrow Press, Inc.

Jwaifell, M., & Gasaymeh, A. M. (2013). Using the diffusion of innovation theory to explain the degree of English teachers' adoption of interactive whiteboards in the Modern Systems School in Jordan: A case study. *Contemporary Educational Technology, 4*(2), 138-149. Retrieved from http://cedtech.net/

Kachel, D. E., & Lance, K. C. (2013). Latest study: A full-time school librarian makes a

critical difference in boosting student achievement. *School Library Journal.* Retrieved from http://www.slj.com/

Kalantzis, M., Cope, B., & Harvey, A. (2003). Assessing multi-literacies and the new basics. *Assessment in Education: Principles, Policies, and Practice, 10*(1), 15-26. doi:10.1080/09695940301692

Kelly, S. M. (2012). Assistive technology use linked to learning theory: A theoretical framework. *Insight,5*(3), 175-182. Retrieved from http://www.vision-research.eu

Kennewell, S., & Beauchamp, G. (2007). The features of interactive whiteboards and their influence on learning. *Learning, Media, and Technology, 32*(3), 227-241. doi:10.1080/17439880701511073.

Kennewell, S., Tanner, H., Jones, S., & Beauchamp, G. (2008). Analysing the use of interactive technology to implement interactive teaching. *Journal of Computer Assisted Learning, 24*(1), 61-74. doi:10.1111/j.1365-2729.2007.00244.x

Kenney, B. (2011). SLJ's 2011 Technology survey: Things are changing, fast. *School Library Journal*, *57*(5), 28-33. Retrieved from http://eric.ed.gov/

Kervin, L., & Mantei, J. (2010). Incorporating technology within classroom literacy experiences. *Journal of Literacy and Technology, 11*(3), 77-100. Retrieved from http://ro.uow.au/

Killian, L. (2009). New textual formats: Reading online is re-wiring the human brain and changing how we process information. *Dalhousie Journal of Interdisciplinary Management, 4*(1), 1-13. Retrieved from http:djim.management.dal.ca

Kitchenham, A. (2006). Teachers and technology: A transformative journey. *Journal of Transformative Education, 4*(3), 202-225. doi:10.1177/154134460629094

Kitchenham, A. (2013). The preservation of Canadian indigenous and culture through educational technology. *Alternative: An International Journal of Indigenous Peoples, 9*(4), 351-364. Retrieved from http://www.alternative.ac.nz/.

Koh, J., & Divaharan, S. (2013). Towards a TPACK-fostering ICT instructional process for teachers: Lessons from the implementation of interactive whiteboard instruction. *Australasian Journal of Educational Technology*, *29*(2), 233-247. Retrieved from http://eric.ed.gov/

Kopcha, T. J. (2010). A systems-based approach to technology integration using mentoring and communities of practice. *Education Technology Research Development, 58*(2), 175-190. doi:10.1007/s11423-008-9095-4

Kopkowski, C. (2008). Why they leave: lack of respect, NCLB, and underfunding. *NEA Today Online.* Retrieved from http://www.nea.org/home/12630.htm

Kramer, P.K., & Diekman, L. (2010). Evidence=Assessment=Advocacy. *Teacher Librarian, 37*(3), 27-30. Retrieved from http://www.teacherlibrarian.com.

Kress, G. (2003). *Literacy in the New Media Age*. London: Routledge.

Kumar Bahadur, G., & Oogarah, D. (2013). Interactive whiteboard for primary schools in Mauritius: An effective tool or just another trend. *International Journal of Education & Development Using Information & Communication Technology,* 9(1), 19-35. Retrieved from http://ijedict.dec.uwi/

LaBombard, J. C. (2009). *A qualitative case study of professional development processes*

in the classroom: From initiatives to implementation. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3344510).

Lacina, J. (2009).Technology in the classroom Interactive whiteboards: Creating higher-level, technological thinkers? *Childhood Education, 85*(4), 270-272. doi:10.1080/00094056.2009.10523097.

Lamb, A. (2011). Bursting with potential: Mixing a media specialist's palette. *TechTrends, 55*(4), 27-36. Retrieved from http://aect.site-ym-.com/

Lamb, A., & Johnson, L. (2011). Sensible approaches to technology for teaching, learning, and leadership. *Teacher-librarian, 38*(3), 62-65. ISSN: 14811782. Retrieved from http://www.teacherlibrarian.com

Lamb, A., & Johnson, L. (2012). Creativity & standards: Amazing authentic approaches. *Eduscapes.* Retrieved from http://Eduscapes.com/sessions/creativity

Lambert, L., Walker, D., Zimmerman, P., Cooper, J. E., Lambert, M.D., Gardner, M. E. (2002). *The Constructivist Leader*. New York, NY: Teachers College.

Lance, K. C., Rodney, M. C., & Schwarz, B. (2010). The impact of school libraries on academic achievement: A research study based on responses from administrators in Idaho. *School Library Monthly, 26*(9), 14-17. Retrieved from http://eric.ed.gov/

Latham, D., Gross, M., & Witte, S. (2013). Preparing teachers and librarians to collaborate to teach 21st century skills: Views of LIS and education faculty. *School Library Research, 16.* Retrieved from http://www.ala.org/aasl/slr/

Lawrence-Lightfoot, S., & Davis, J. H. (1997). *The Art and Science of Portraiture*. San

Francisco, CA: Jossey-Bass.

Leach, C. (2010). The use of SmartBoard and bespoke software to develop and deliver an inclusive, individual and interactive learning curriculum of students with ASD. *Journal of Assistive Technologies, 4*(1), 54-57. doi:10.5042/jat.2010.0045

Learning Forward. (2011). *Evidence of Effectiveness*. Edited by V. von Frank. Oxford, OH: Learning forward (formerly National Staff Development Council). Retrieved from http://www.learningforward.org/

Lewin, C., Scrimshaw, P., Somekh, B., & Haldane, M. (2009). The impact of formal and informal professional development opportunities on primary teachers' adoption of interactive whiteboards. *Technology, Pedagogy and Education, 18*(2), 173-185. doi:10.1080/14759390902992592

Lewis, J.P. (2007). *The Project Manager's Desk Reference (3rd Ed.).* New York, NY: McGraw-Hill.

Liang, T.-H., Huang, Y.-M., & Tsai, C.-C. (2012). An investigation of teaching and learning interaction factors for the use of the interactive whiteboard technology. *Journal of Education Technology & Society, 15*(4), 356-367. Retrieved from http://www.ifets.info/journals/

Liles, M. (2005). Interactive whiteboard system drives increased achievement at Texas School for the Deaf. *T H E Journal, 32*(10), 49-50. Retrieved from thejournal.com/

Lipscomb, L., Swanson, J., & West, A. (2004). Scaffolding. In M. Orey (Ed.), *Emerging Perspectives on Learning, Teaching, and Technology.* Retrieved from

http://projects.coe.uga.edu/epltt

Lisenbee, P. S. (2009). *Influences on young children's behavior, engagement level and representation during storytelling using an interactive whiteboard*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Text database. (UMI No. 3358965).

Littleton, K. (2010). Research into teaching with whole-class interactive technologies: emergent themes. *Technology, Pedagogy and Education, 19*(2), 285-292. doi: 10.1080/1475939X.2010.491240

Livingstone, S. (2012). Critical reflection on the benefits of ICT in education. *Oxford Review of Education, 38*(10), 9-24. doi:10.1080/03054985.2011.577938

Loertscher, D. (2010). Curriculum, the library/learning commons, and teacher librarians: Myths and realities in the second decade. *Teacher Librarian, 37*(3), 8-13. Retrieved from http://www.teacherlibrarian.com

Loertscher, D., & Diggs, V. (2009). From library to learning commons: a metamorphosis. *Teacher Librarian, 36*(4), 32-28. Retrieved from http://www.teacherlibrarian

Maher, D. (2011). Using the multimodal affordances of the interactive whiteboard to support students' understanding of texts. *Learning, Media and Technology, 36*(3), 235-250. doi:10.1080/17439884.2010.536553

Maher, D. (2012). Teaching literacy in primary schools using an interactive whole-class technology: Facilitating student-to-student whole-class dialogic interactions. *Technology, Pedagogy and Education, 21*(1), 137-152. doi:10.1080/ 14759392x.2012.659888

Manny-Ikan, E., Dagan, O., Berger-Tikochinski, T. & Zorman, R. (2011). Using the interactive whiteboard in teaching and learning – An evaluation of the Smart Classroom pilot project. *Interdisciplinary Journal of e-Learning and Learning Objects, 7*(1), 249-273. Retrieved from http://www.ijello.org/

Manzo, K.K. (2010). Whiteboards' impact on teaching seen as uneven. *Education Week, 3*(2), 34. Retrieved from http://www.edweek.org/

Marco, D. & Jennings, M. (2004). *Universal Meta Data Models.* Indianapolis, IN: Wiley.

Marcoux, E., & Loertscher, D. V. (2009). Achieving teaching and learning excellence with technology. *Teacher Librarian, 37*(3), 14-22. Retrieved from http://teacherlibrarian.org

Martin, A. (2008). Digital literacy and the digital society, pp. 151-176. In C. Lankshear & M. Knobel (Eds.), *Digital Literacies: Concepts, Policies and Practices.* New York, NY: Peter Lang.

Martin, A., & & Madigan, D. (Eds.). (2006). *Digital Literacies for Learning.* London, UK: Facet.

Marzano, R. J. (2009). Teaching with interactive whiteboards. *Educational Leadership, 67*(3), 80-82. Retrieved from http://www.ascd.org/

Mathews-Aydinli, J., & Elaziz, F. (2010). Turkish students' and teachers' attitudes toward the use of interactive whiteboards in EFL classrooms. *Computer Assisted Language Learning, 23(*3), 235-252. doi:10.1080/09588221003776781

Matteson, S. (2013). *College Students' Perceptions of College Preparedness*. (Doctoral dissertation). Walden University. Retrieved from ProQuest Dissertations &

Theses Full Text database (UMI No. 355-4788).

McLoughlin, E. (2012). *The Impact of Professional Development on Teaching*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Full Text database (UMI No. 3503406).

McPherson, K. (2004). Multiplying literacies in school libraries. *Teacher Librarian, 32*(1), 60-62. Retrieved from http://www.teacherlibrarian.com

McQuillan, K., Northcote, M., & Beamish, P. (2012). What matters most when students and teachers use interactive whiteboards in mathematics classrooms? *Australasian Primary Mathematics Classroom, 17*(4), 3-7. Retrieved from http://eric.ed.gov/

Mercer, N., Hennessey, S. & Warwick, P. (2010). Using interactive whiteboards to orchestrate classroom dialogue. *Technology, Pedagogy, and Education, 19*(2), 195-209. doi:10.1080/1475939X.2010.491230

Meyer, L. (2013). Most professional development 'sporadic, short term and divorce from teaching and student achievement. *T H E Journal, July 18, 2013.* Retrieved from http://thejournal.com/

Meyer, N. (2010). Collaboration success for student achievement in social studies: The Washington State story. *Teacher Librarian, 37*(4), 40-43. Retrieved from http:www.teacherlibrarian.com

Miles, M.B. & Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook (2nd Ed.).* Thousand Oaks, CA: Sage.

Miller, D., & Glover, D. (2007). Into the unknown: the professional development induction experience of secondary mathematics teachers using interactive

whiteboard technology. *Learning, Media and Technology, 32*(3), 319-331. doi:10.1080/17439880701511156

Miller, D., & Glover, D. (2010). Presentation or mediation: Is there a need for 'interactive whiteboard technology-proficient' teachers in secondary mathematics? *Technology, Pedagogy and Education, 19*(2), 235-259. doi:10.1080/1475939X.2010.491236

Mohon, E. H. (2008). SMART moves? A case study of one teacher's pedagogical change through the use of the interactive whiteboard. *Learning, Media and Technology, 33*(4), 301-312. doi:10.1080/17439880802497032

Montiel-Overall, P. (2008). Teacher and librarian collaboration: A qualitative study. *Library & Information Science Research, 30*(1), 145-155. doi:10.1016/j.lisr.2007.06.008

Montiel-Overall, P., & Jones, P. (2011). Teacher and school librarian collaboration: A preliminary report of teachers' perceptions about frequency and importance to student learning. *Canadian Journal of Information and Library Science, 35*(1), 49-75. doi:10.1353/ils.2011.0001

Moreillon, J. (2013). Educating for school library leadership: Developing the instructional partnership role. *Journal of Education for Library and Information Science, 54*(1), 55-66. Retrieved from http://www.alise.org/

Morgan, G. L. (2008). *Improving Student Engagement: Use of the Interactive Whiteboard as an Instructional Tool to Improve Engagement and Motivation in the Junior High School Classroom*. (Unpublished Ph.D. dissertation). Liberty

University, Virginia. Retrieved from http://digitalcommons.liberty.edu/

Morris, B.J. (2010). *Administrating the School Library Media Center (5th ed.)*. Westport, CT: Libraries Unlimited.

Moss, G., Jewitt, C., Levaãiç, R., Cardini, A. & Castle, F. (2007). *The Interactive Whiteboards, Pedagogy and Pupil Performance Evaluation: An Evaluation of the Schools Whiteboard Expansion (SWE) Project: London challenge.* London, England: University of London. Retrieved from http://eprints.ioe.ac.uk/

Mullamaa, K. (2010). ICT in language learning – benefits and methodological implications. *International Education Studies, 3*(1), 38-44. Retrieved from http://ccsenet.org/journal/

Murcia, K. (2013). Interactive and multimodal pedagogy: A case study of how teachers and students use interactive whiteboard technology in primary science. *Australian Journal of Education, 58*(1), 74-88. doi:10.1177/0004944113517834

Murcia, K., & Sheffield, R. (2010). Talking about science in interactive whiteboard classrooms. *Australasian Journal of Educational Technology* [Special issue], *26* (4), 417-431. Retrieved from http://www.ascilite.org.au/ajet/ajet26/murcia.html

Murray, E.A., Sheets, H.A., & Baldwin, N. (2009). *The New Work of Assessment: Evaluating Multimodal Compositions: A Theoretical Introduction to Multimodal Compositions and Assessment.* Retrieved from http://www.bgsu.edu/cconline/murray_etal/introduction.html

Nelson, Suzan. (2011).*School Librarian Perceptions of Professional Identity.* (Doctoral dissertation). Walden University. Retrieved from ProQuest Dissertations &

Theses: Full Text (UMI No. 3481822).

Neuman, D. (2012). Here comes the future: Information is the building block for learning. *Knowledge Quest, 40*(3), 24-28. Retrieved from http://eric.ed.gov/

Northcote, M., Midenhall, P., Marshall, L., & Swan, P. (2010). Interactive whiteboards: interactive or just whiteboards? *Australasian Journal of Educational Technology, 26*(4), 494-590. Retrieved from http://eric.ed.gov/

November, A. (2009). *Empowering Students with Technology (2nd Ed.).* Thousand Oaks, CA: Corwin.

November, A. (2012). *Designing libraries: Learning for a lifetime.* Retrieved from http://www.novemberlearning.com/educational-resources-for-educators/teaching-and-learning-articles/designing-libraries/

Oblinger, D., & Oblinger, J. (2005). Educating the net generation. *Educause.* Retrieved from http://www.educause.edu/

Ohler, J. (2009). Orchestrating the media collage. *Best of Educational Leadership 2008-2009, 66*, 8-13. Retrieved from http://eric.ed.gov/

Olson, B. (2008). *Interactive whiteboards in Minnesota media centers. Master's Thesis.* Retrieved from ProQuest Dissertations and Theses database. (UMI No. 1460219).

Orlando, J. (2013). ICT-mediated practice and constructivist practices: Is this still the best plan for teachers' uses of ICT? *Technology, Pedagogy and Education 22*(2), 231-246. doi:10.1080/147593911X.2013.782702

Palfrey, J. & Gasser, U. (2008). *Born Digital: Understanding the First Generation of Digital Natives.* New York, NY: Basic Books.

Patton, M. (2002). *Qualitative research and evaluation methods (3rd Ed.).* London, U.K: Sage.

Perez, L. (2010). The role of school librarians in promoting the use of educational technologies. *Teacher Librarian*, *38*(1), 72-73. Retrieved from http://www.teacherlibrarian.com

Petzke, J. (2009). *The Nature of Teacher Growth as Perceived by Extraordinary Elementary School Teachers in the Midwest.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses: Full Text (UMI No. 3353864).

Pierce, R. & Ball, L. (2009). Perceptions that may affect teachers' intention to use technology in secondary mathematics classrooms. *Educational Studies in Mathematics, 71,* 299-317. doi:10.1007/s16049-008-9177-6

Polly, D. & Hannafin, M. J. (2010). Reexamining technology's role in learner-centered professional development. *Educational Technology Research and Development, 58*, 557-571. doi:10.1007/s11423-009-9146-5

Prensky, M. (2001). Digital natives, digital immigrants, part II: Do they really think differently? *On the Horizon*, *9*(6), 15-24. doi:10.1108/10748120110424843

Pritchard, A. & Woollard, J. (2010). *Psychology for the Classroom: Constructivism and Social Learning.* New York, NY: Routledge.

Project Management Institute (2013). *A Guide to the Project Management Body of Knowledge (5th Ed.).* Newtown Square, PA: Project Management Institute.

Promethean (2014). *Other interactive products: ActivWand.* Promethean World. Retrieved from http://www.prometheanworld.com/us/english/education/other-

interactive-products/activwand/

Punie, Y., Zinnbauer, D., Cabrera, M. (2006). *A Review of the Impact of ICT on Learning*. Seville, Spain: Institute for Prospective Technological Studies. Retrieved from http://ftp.jrc.es/

Purcell, M. (2010). All librarians do is check out books, right? A look at the roles of a school library media specialist. *Library Media Connection, 29*(3), 30-33. Retrieved from http://eric.ed.gov/

Reedy, G. B. (2008). PowerPoint, interactive whiteboards, and the visual culture of technology in schools. *Technology, Pedagogy and Education, 17*(2), 143-162. doi:10.1080/14759390802098623

Reeve, F. & Church, A. P. (2013). Mentoring through collaborative partnerships. *Knowledge Quest, 41*(4), 1-15. Retrieved from http://www.ala.org/ala/mgrps/divs/aaslpubsandjournals/knowledgequest/knowledgequest.cfm

Riesland, E. (2003). Visual literacy and the classroom. *New Horizons for Learning.* Retrieved from http://www.newhorizons.org/strategies/literacy/Riesland.htm

Rivers, G. (2009). *Interactive Whiteboards in Third Grade Science Instruction*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Full Text database (UMI No. 3358895).

Roessingh, H. (2006). BICS-CALP: An introduction for some, a review for others. *TESL Canada Journal, 23*(2), 91-96. Retrieved from http://eric.ed.gov/

Rosen, L. D. (2001). Teaching the iGeneration. *Educational Leadership, 68*(5), 10-15. Retrieved from http://www.ascd.org/

Salend, S. (2009). Using technology to create and administer accessible tests. *Teaching Exceptional Children, 41*(3), 40-51. Retrieved from http://journals.cec.sped.org/tec/.

Scoggins, C. (2010). *Professional Development in Elementary School Mathematics*. Retrieved from ProQuest Dissertations & Theses Full Text database (UMI No. 3423909).

Schwartz, M. & Thormann, J. (2010). Science on the big screen. *Learning & Leading With Technology*, *37*(5), 32-33. Retrieved from http://www.learningandleading-digital.com/

Schweder, W., Wissack, C., & Mounce, A. (2008). Teaching content with interactive whiteboards. *Journal of Special Education Technology, 23*(1), 54-58. Retrieved from http://www.tamcec.org/jset/index/

Selfe, C. L. (2007). Students who teach us: A case study of a new media text. In A. Wysocki, J. Johnson-Eilola, C. L. Selfe, & G. Sirc (Eds.), *Writing New Media: Theory and Applications for Expanding the Teaching of Compositions* (pp.43-66). Logan, UT: Utah State University Press.

Senteni, A. & Tamin, R. (2011). Online collaboration empowering minds for the future. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011*. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE). Retrieved from http://www.editlib.org/j/EDMEDIA/

Serow, P. & Callinghan, R. (2011). Levels of use of interactive whiteboard technology in

the primary mathematics classroom. *Technology, Pedagogy and Education, 20* (2), 161-173. doi:10.1080/1475939X.2011.588418

Sharma, A. (2012). Interactive whiteboard technology in English language teaching classrooms in India. *Language in India, 12*(1), 93-98. Retrieved from http://www.languageinindia.com/

Shattuck, G. (2009). Understanding school leaders' role in teachers' adoption of technology integrated classroom practices. (Unpublished dissertation). Ph.D. dissertation, University of Georgia, United States. Retrieved from http://athenaeum.libs.uga.edu/handle/10724/11283

Shattuck, G. (2010). School leaders' role in teachers' adoption of technology integration classroom practices. *Educational Media and Technology yearbook, 35*(1), 7-28. doi:10.1007/978-1-4419-1516-0_2

Shenton, A. & Pagett, L. (2007). From 'bored' to screen: The use of the interactive whiteboard for literacy in six primary classrooms in England. *Literacy, 41*(3), 129-136. doi:10.1111/j.1467-9345.2007.00475.x

Sheppard, J. (2010). Developing multimodal literacy: The role of collaboration and constraints in the design of new media assignments. *Journal of Literacy and Technology, 11*(1), 42-62. Retrieved from http://www.literacyandtechnology.org/

Simpson, K. & Keen, D. (2010). Teaching young children with autism graphic symbols embedded within an interactive song. *Journal of Physical Development Disabilities, 22* (11), 165-177. doi:10.1007/s10882-009-9173-5

Sipilä, K. (2014). Educational use of information and communications technology:

Teachers' perspective. *Technology, Pedagogy and Education, 23*(2), 225-241. doi:10.1080/1475939X.2013.813407

Slama, R. B. (2012). A longitudinal analysis of academic English proficiency outcomes for adolescent English language learners in the United States. *Journal of Educational Psychology*, *104*(2), 265-285. doi:10.1037/a0025861

Slay, H., Sieborger, I., & Hodgkinson-Williams, C. (2008). Interactive whiteboards: Real beauty or just "lipstick"? *Computers & Education, 51,* (3), 1321-1341. doi:10.1016/j.compedu.2007.12.006

Small, R. V., Shanahan, K. A., & Stasak, M. (2010). The impact of New York's school libraries on student achievement and motivation: Phase III. *School Library Research, 13.* 1-31. Retrieved from: http://eric.ed.gov/

Small, R. V, Snyder, J., & Parker, K. (2009). The impact of New York's school libraries on student achievement and motivation: Phase I. *School Library Media Research,* pp.121-34. Retrieved from http://eric.ed.gov/

Smart Technologies Inc. (2005). *The Florida School for the Deaf and the Blind: Case study.* Retrieved from www.smarttech.com/

Smith, F., Hardman, F. & Higgins, S. (2006). The impact of interactive whiteboards on teacher pupil interaction in the national literacy and numeracy strategies. *British Educational Research Journal, 32*(3), 443-457. doi:10.1080/0141192 0600635452

Smith, H. J., Higgins, S., Wall, K. & Miller, J. (2005). Interactive whiteboards: boon or bandwagon? A critical review of the literature. *Journal of Computer Assisted*

Learning, 21(2), 91-101. doi:10.111/j.1365-2729.2005.00117.x

Snow, C. E. (2010). Academic language and the challenge of reading for learning about science. *Science, 328*(450), 450-452. doi:10.1106/science.1182597

Socol, I. D. (2010). The unhappy place: What libraries can do to welcome kids who struggle with print. *School Library Journal.* Retrieved from http://eric.ed.gov/

Solvie, P. A. (2004). The digital whiteboard: A tool in early literacy instruction. *Reading Teacher, 57*(5), 484-487. Retrieved form http://www.readingonline.org/

Solvie, P. A. (2007). Leaping out of our skins: Postmodern considerations in use of an electronic whiteboard to foster critical engagement in early literacy lessons. *Educational Philosophy and Theory, 39*(7), 737-754. doi:10.1111/j.1469-5812.2007.00312.x

Somyürek, S., Atasoy, B. & Özdemir, S. (2009). Board's IQ: What makes a board smart? *Computers and Education, 53*(2), 368-374. doi:10.1016/j.compedu.2009.02.012

Sorensen, E. & Murchú, Ó. (2006). *Enhancing Learning Through Technology*. Hershey, PA: Information Science.

Stark, R. (2010). *Qualitative Research: Studying How Things Work*. New York, NY: Guilford.

Stroup, L., deWolf, M., & Lincoln, M. (2010). School librarians as digital librarians. *Knowledge Quest, 39*(2), 70-78. Retrieved from http://www.ala.org/ala/mgrps/divs/aaslpubsandjournals/knowledgequest/

Sundberg, B., Spante, M., & Stenlund, J. (2012). Disparity in practice: Diverse strategies among teachers implementing interactive whiteboards into teaching practice in

two Swedish primary schools. *Learning, Media & Technology, 37*(3), 253-270. doi:10.1080.17439884.2011.586352

Swan, K., Schenker, J. & Kratcoski, A. (2008). The effects of the use of interactive whiteboards on student achievement. In J. Luca, J. & M. Weippl (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008 (pp. 3390-3297)*.. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE). Retrieved from http://www.editlib.org/p/28842/

Sweeney, T. (2010). Transforming pedagogy through interactive whiteboards: Using activity theory to understand tensions in practice. *Australasian Educational Computing, 24*(4), 28-34. Retrieved from http://eric.ed.gov/

Sweeney, T. (2013). Understanding the use of interactive whiteboards in primary science. *Australasian Journal of Educational Technology, 29*(2), 217-232. Retrieved from http://eric.ed.gov/

Tapscott, D. (1998). *Growing Up Digital: The Rise of the Net Generation*. New York, NY: McGraw-Hill.

Tapscott, D. (2009). *Grown Up Digital: How the Net Generation Is Changing Your World.* New York, NY: McGraw Hill.

Tay, L. Y., Lim, S. K., Lim, C. P., & Koh, J. H. (2012). Pedagogical approaches for ICT integrations into primary school English and mathematics: A Singapore case study. *Australasian Journal of Educational Technology, 28*(4), 740-754. Retrieved from http://www.ascilite.org.au/ajet/ajeet28/tay.htm

Terreni, L. (2010). Adding new possibilities for visual art education in early childhood settings: The potential of interactive whiteboards and ICT. *Australasian Journal of Early Childhood, 35*(4), 90-94. Retrieved from http://www.earlychildhoodaustralia.org.au/

Thiry, M. (2010). *Program Management: Fundamentals of Project Management.* Burlington, VT: Gower.

Troutner, J. (2012). Web wonders: Professional development. *Teacher Librarian, 39*(5), 54-56. Retrieved from http://www.teacherlibrarian.com

Trujillo, T. & Renée, M. (2013). Democratic school turnarounds: Pursing equity and learning from evidence. *The Education Digest, 78*(7), 55-59. Retrieved from http://greatlakescenter.org/

Tully, C. (2008). *What is multimodal composition and who is doing it? Taking a traditional composition program 'multimodal"; Web 2.0 and institutional change at a small liberal arts institution.* Retrieved from http://homepages.findlay.edu/tulley/whatisMMC.htm

Türel, Y. & Johnson, T. E. (2012). Teachers' belief and use of interactive whiteboards for teaching and learning. *Educational Technology & Society, 15*(1), 381-394. Retrieved from http://eric.ed.gov/

Underwood, J. & Dillon, G. (2011). Chasing dreams and recognizing realities: Teachers' responses to ICT. *Technology, Pedagogy and Education, 20*(3), 317-330. doi:10.1080/1475939X.2011.610932

University of Idaho Library (2011). *Information literacy.* Retrieved from

http://www.webs.uidaho.edu/info_literacy/

Urquhart, C., Thomas, R., Spink, S., Fentona, R., Yeoman, A. Lonsdale, R.,…Rowley, J. (2005). Student use of electronic Information Services in Further Education. *International Journal of Information Management, 25*(4), 347-362. doi:10.1016/j.ijinfomgt.2005.04.006

Van Duesen, J. (1996). The school library media specialist as a member of the teaching team: 'Insider' and 'outsider.' *Journal of Curriculum and Supervision, 11*(3), 229-248. Retrieved from http://eric.ed/gov/

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.

Walden University (n.d.). *Sample confidentiality agreement.* Retrieved from http://researchcenter.walden.edu/Office-of-Research-Integrity-and-Compliance.htm

Walker, T. (2013). Professional development: It's time for a change. *NEA Today.* Retrieved from http://www.nea.org/home/55173.htm

Wall, K., Higgins, S. & Smith, H. (2005). "The visual helps me understand the complicated things": Pupil views of teaching and learning with interactive whiteboards. *British Journal of Educational Technology, 36*(5), 851-867. doi:10.1111/j.1467-8535.2005.00508.x

Warwick, P. & Kershner, R. (2008). Primary teachers' understanding of the interactive whiteboard as a tool for children's collaborative learning and knowledge-building. *Learning, Media and Technology, 33*(4), 269-287. doi:10.1080/174398808024

96935

Warwick, P., Mercer, N., Kershner, R., & Staarman, J.K. (2010). In the mind and in the technology: The vicarious presence of the teacher in pupil's learning of science in collaborative group activity at the interactive whiteboard. *Computers & Education, 55*(1), 350-362. doi:10.1016.jcompedu.2010.02.001

Webb, P. (2010). Science education and literacy: Imperatives for the developed and developing world. *Science, 328*(5977), 448-450. doi:10.1126/science.1182596

Whitby, P., Leiniger, M., & Grillo, K. (2012). Tips for using interactive whiteboards to increase participation of students with disabilities. *Teaching Exceptional Children, 44*(6), 50-57. Retrieved from http://eric.ed.gov/

Whiting, M. (2011). Why school libraries are more important than ever! *School Library Association of New Zealand: Collected, 4*(11), 9. Retrieved from http://www.slanza.org.nz/

Wilson, C. (2012). Media and information literacy: Pedagogy and possibilities/ Alfavetizacion mediática e informacional: Proyecciones didácticas. *Comunicar, 20*(30), 15-22. doi:10.3916/C39-2012-02-01

Wink, J. & Putney, L. (2002). *A Vision of Vygotsky*. Boston, MA: Allyn and Bacon.

Winzenreid, A., Dalgarno, B., & Tinkler, J. (2010). The interactive whiteboard: A transitional technology supporting diverse teaching practices. *Australasian Journal of Educational Technology*, *26*(24), 534-552. Retrieved from http://eric.ed.gov/

Wolf, S., Brush, T., & Saye, J. (2003). *The Big 6 Information Skills as a Metacognitive*

Scaffold: A Case Study. Chicago, IL: American Library Association. Retrieved from http://www.ala.org/aasl/aaslpubandjournals/

Wong, K-T., Goh, P. S. C., & Osman, R. (2013). Affordances of interactive whiteboards and associated pedagogical practices: Perspectives of teachers of science with children aged five to six years. *Turkish Online Journal of Educational Technology, 12,* (1) 1-8. Retrieved from http://eric.ed.gov/

Wood, R. & Ashfield, J. (2008). The use of the interactive whiteboard for creative teaching and learning in literacy and mathematics. *British Journal of Educational Technology, 39*(1), 84-96. doi:10.1111/j.1467-8535.2007.00703.x

Wysocki, A., Johnson-Eilola, J., Selfe, C. L., & Sirc, G. (Eds.). (2008). *Writing New Media: Theory and Applications for Expanding the Teaching of Compositions.* Logan, UT: Utah State University Press.

Xin, J. F. & Sutman, F. X. (2011). Using the Smart Board in teaching social stories to students with autism. *Teaching Exceptional Children, 43*(4), 18-24. Retrieved from http://eric.ed.gov/

Xu, H. L. & Moloney, R. (2011). "It makes the whole learning experience better": Student feedback on the use of the interactive whiteboard in learning Chinese at tertiary level. *Asian Social Science, 7*(10), 20-34. Retrieved from http://www.ccsenet.org/journal/

Yakubova, G. & Taber-Doughty, T. (2013). Brief report: Learning via the electronic whiteboard for two students with autism and a student with moderate intellectual disability. *Journal of Autism and Developmental Disorders, 43*(6), 1465-1472.

Retrieved from http//eric.ed.gov/.

Yán□ez, L. & Coyle, Y. (2011). Children's perceptions of learning with an interactive whiteboard. *English Language Teaching Journal, 65*(4), 446-457. doi:10.1093/elt/ccq069

Yang, K., Wang, T., & Kao, Y. (2012). How an interactive whiteboard impacts a traditional classroom. *Education as Change, 16*(2), 313-332. doi:10.1080/16823206.2012.745759

Yelas, J. & Engles, P. (2010). Project ACTIVate: Innovations from New Zealand. *Australasian Journal of Educational Technology, 26*(4), 432-446. Retrieved from http://www.ascilite.org.au/ajet/

Yin, R. (2009). *Case Study Research: Design and Methods (4th ed.)*. Thousand Oaks, CA: Sage.

Yudt, K. & Columba, L. (2011). Interactive whiteboards: A tool for enhancing teaching and learning. *Journal of Technology Integration in the Classroom, 3*(2), 17-22. Retrieved from http://www.joti.us/

Zepeda, S. J. (2008). *Professional Development: What Works*. Larchmont, NY: Eye on Education.

Zevenbergen, R. & Lerman, S. (2008). Learning environments using interactive whiteboards: New learning spaces or reproduction of old technologies? *Mathematics Education Research Journal*, *20*(1), 108-126. Retrieved from http://eric.ed.gov/

Zmuda, A. & Harada, V. H. (2008). Librarians as learning specialists: Moving from the

margins to the mainstream of school leadership. *Teacher Librarian*, *36*(1), 15-20. Retrieved from http://www.teacherlibrarian.com/

Appendix A: Professional Development Project

Audience:

- This project is designed first for librarians and other teachers who will then share information with other teachers, instructional coaches, instructional technologists, and other teacher librarians.

Objectives:

1. The professional development would provide a more complex understanding of the interactive whiteboards for all attendees, including how best to incorporate it into pedagogical goals and classroom teaching experiences. This training would include technology fundamentals and their application to lesson plans, as well as basic troubleshooting for interactive whiteboards.
2. The participants would discuss how to provide enhanced use of technology in pedagogical goals for promoting student learning in multiple literacies.
3. The participants would discuss ways to create opportunities for collaboration at all levels, including formalizing opportunities to meet regularly with teacher librarians during their grade level meetings to plan collaborative lessons. With the demands placed on teachers' schedules and the need to reinforce or learn new skills, a framework for ongoing collaboration is necessary for successful implementation of technology.
4. The teacher, teacher librarians, instructional coaches, and instructional technologists would develop the structure, user requirements, and technologies for a repository of interactive whiteboard-based lesson plans.

5. The participants would discuss the creation of interactive whiteboard technology mentors for all grade levels or subject levels. These mentors would provide mentoring and coaching to fellow teachers on how to best use interactive whiteboards to support the curriculum. The mentors would act as the subject matter experts for both the technology and lesson plans associated with the technology.

Agenda

Breakfast, lunch, and snacks will be provided to encourage attendees to arrive early and stay for the entire workshop (Matteson, 2013, p. 66**).**

Day 1

Participants will focus on objectives 1 and 2, understanding the use of application of interactive whiteboards into classroom lesson plans.

Session 1 –

7:30-7:55: Participants will be provided with a simple breakfast of pastries, fruit, coffee, tea, juice, and water to encourage early arrival.

7:55: Participants would take the formative assessment (Handout 1). This will be used to benchmark their level of knowledge of ActivBoards.

8:00-8:30: The presenter would introduce the professional development workshop using the provided PowerPoint presentation.

8:30-9:30: In a large group discussion, participants will be provided basic / intermediate training on the interactive whiteboard. Participants will demonstrate favorite tools, tips, tricks, and techniques (Handout 2). Attendees will recommend their preferred interactive whiteboard applications.

9:30-9:45 Break (refreshments, restroom).

10:00-10:45: Participants will divide into small groups to discuss best practices of interactive whiteboard lessons, such as differentiated instruction and the incorporation of other technological resources.

10:45-11:30: In a large group discussion, participants will discuss how to enhance literacy instruction, including digital, information, media, and print literacy. The attendees will brainstorm ways to encourage the use of interactive whiteboards throughout the school.

11:30-11:45; Participants will take the summative assessment (Handout 3), followed by the session wrap up and a question and answer period.

11:45-12:30: Break for lunch.

Session 1 Materials
Handout 1 – Formative Assessment
Handout 2 – Basic/Intermediate ActivBoard Training Materials
Handout 3 – Summative Assessment

Session 2

12:30-1:30: The presenter will describe the social studies lesson plan. In small group discussions, teachers create an interactive whiteboard lesson using Handout 4 (Possible Resources for Interactive Whiteboards), Handout 5 (Lesson Plan Websites), and Handout 7 (Social Studies Lesson Plan).

1:30-1:45: Break (restroom, refreshments).

1:45-3:15: In a large group discussion, the attendees will present the lesson plans they created in their small group discussions.

3:15-3:30: Participants will take the summative assessment (Handout 3). This will be followed by the session wrap up and a question and answer period.

Session 2 Materials

Handout 4 – Possible Resources for Interactive Whiteboards

Handout 5 – Lesson Plan Websites

Handout 6 – Lesson Plan Template

Handout 7 – Social Studies Lesson Plan

Handout 3 – Summative Assessment

Day 2

Participants will focus on objectives 3 and 4 (collaboration and technology mentors).

Session 3

7:30-8:00: Participants will be provided with a simple breakfast of pastries, fruit, coffee, tea, juice, and water. Copies of the formative assessment (Handout 1) will be completed by the attendees and returned to the presenter.

8:00-9:45: The teacher librarian will discuss the objectives for the day of creating and locating interactive whiteboard lessons. The teacher librarian and a teacher will model a collaborative effort to teach a topic together. Using Handout 6 Lesson Plan Template). The

9:45-10:00: Break (restroom, refreshments).

10:00-11:30: The teacher librarians and the teachers would create a tentative timetable, assigning each grade or subject level a different month in which to collaborate. Utilizing the interactive whiteboard lesson plan format created in Session 3, each grade level or subject level would define a topic to be co-taught with the teacher librarian for that assigned month. The teacher librarian would give a copy of the timetable to the administrators for consideration.

11:30-11:45: Participants will take a summative assessment, followed by the session wrap up and a question and answer period.

11:45-12:30: Break for lunch.

Session 3 Materials
Handout 6 – Collaborative Lesson Plan Template
Handout 3 – Summative Assessment

Session 4

The participants will focus on objective 5 (creating technology mentors for each grade or subject level).

12:30-1:30: In large group discussion, participants will discuss the creation of interactive whiteboard technology advocates at each grade level. Topics will include best practices for technology adoption, and pedagogical integration.

1:30-1:45: Break (restroom, refreshments).

1:45-3:00: In small group discussions, teachers will discuss the characteristics needed for technology mentors. They will recommend the best persons to be the technology mentors for coaching and mentoring for their grade or subject level. The mentors would act as the subject matter experts for both technology and technology-integrated lesson plans. The recommendations for the mentors would be given to the administrators for consideration.

3:00-3:30: Participants will take the summative assessment (Handout 3) before the session wrap up and a question and answer period.

Session 4 Materials
Handout 3 – Summative Assessment

Day 3

The participants will focus on objective 5 (lesson plan repository).

Session 5

7:30-8:00: Participants will be provided with a simple breakfast of pastries, fruit, coffee, tea, juice, and water. Each attendee would complete the formative assessment (Handout 1)

8:00-8:30: The presenter will discuss the benefits of a repository of technology-based lesson plans, available to all teachers in the school system. Each participant would receive a copy of Handout 6 (Collaborative Lesson Plan Template), Handout 7 (Sample Lesson Plan), and Handout 8 (Samples of Lesson Plan Metadata).

8:30-9:30: In large group discussion, the participants will explore what elements or metadata the lesson plans should have, so that they could be located easily within the repository. All suggestions would be recorded on the interactive whiteboard for re-use...

9:30-9:45: Break (restroom, refreshments).

9:45-11:30: Using Handout 6 (Collaborative Lesson Plan Template), Handout 7 (Sample Lesson Plan), and Handout 8 (Samples of Lesson Plan Metadata), teachers would divide into small groups to discuss the requirements for each lesson plan to be submitted, such as author, title, date, objectives, grade level(s), keywords, standards addressed, technologies used, author(s), and a brief description of the lesson. These suggestions would be recorded on the interactive whiteboard by a representative of each group. These metadata will be used in Session 6.

11:30-11:45: Participants will take the summative assessment (Handout 3) followed by the session wrap up and a question and answer period.

11:45-12:30: Break for lunch.

Session 5 Materials
Handout 6 – Collaborative Lesson Plan Template
Handout 7 – Sample Lesson Plan
Handout 8 – Samples of Lesson Plan Metadata
Handout 3 - Summative Assessment

Session 6

The participants will focus on objective 5 (creation of lesson plan repository).

12:30-1:45: The participants will discuss and create a preliminary draft of the metadata to be used for the technology-rich lessons plans in the repository, using the information created on the interactive whiteboard during Session 5.

1:45-2:00: Break (restroom, refreshments).

2:00-3:15: Participants will examine what would constitute best practices for the use of the repository (i.e., content lifecycle management, governance, and stewardship). For example, the lifecycle governance could provide review by determining what lessons to publish, to retain, and what lessons to revise. The governance could determine which lessons to delete, such as lessons used for Expeditionary Learning, which might not be used by the school system again.

Other topics to discuss might be the creation of a preliminary draft of a charter for the repository, which would define the scope and management, as well as the mission and goals. The participants could discuss what supports would be needed from stakeholders (administrators, parents, and members of the school board). The participants could explore how the repository could be used to increase student literacy and student achievement. The draft(s) created by the participants, as well as their suggestions, could be used by the presenter for a deliverable to the administration of the school system.

3:15-3:30: Participants will take the summative assessment (Handout 3) followed by the session wrap up and a question and answer period.

Session 6 Materials
Handout 3 – Summative Assessment

Handout 1: Formative Assessment Handout for Sessions 1 and 5

ActivBoard Quiz - Formative Assessment

1. A computer and a projector are required for an ActivBoard.

- True
- False

2. You use an USB cable to connect your ActivBoard to the projector.

- True
- False

3. You can re-calibrate your ActivBoard at any time.

- True
- False

4. What are the correct steps to do the initial calibration for your ActivBoard?

- Click on Promethean character, hover stylus over top left icon, click on 4 X's, set display resolution.
- Set display resolution, click on Promethean character, hover stylus over top left icon, click on 4 X's.
- Set display resolution, click on Promethean character, hover stylus over top left icon, follow instructions.
- Set display resolution, hover stylus over top left icon, click on board, follow instructions.

5. If your cursor doesn't move, you would first perform this task.

- Unplug and re-plug the USB cable.
- Unplug and re-plug the VGA cable.
- Verify the Promethean character is normal.
- Try another stylus.

Handout 2 for Session 1 and 5: Training on the ActivBoard

Promethean Activboard basic features

http://www.youtube.com/watch?v=h72kvLkQLwE

Making quizzes

http://www.youtube.com/watch?v=bHX55VkUkow

Creating Action objects - Hide & reveal texts

http://www.youtube.com/watch?v=iGIVaZ4ScWs

TeacherTube – How to create a flipchart in five minutes

http://www.teachertube.com/viewVideo.php?video_id=269510

TeacherTube – Using magic Ink

http://www.teachertube.com/viewVideo.php?video_id=263863

TeacherTube - Using Revealer

http://www.teachertube.com/viewVideo.php?video_id=263258

TeacherTube – Embedding HTML

http://www.teachertube.com/viewVideo.php?video_id=264052

Handout 3: Summative Assessment Handout for All Sessions

Survey - Summative assessment

1. How do you rate the workshop content?

- 1 - Poor
- 2 - Fair
- 3 - Neutral
- 4 - Good
- 5 - Excellent

2. How do you rate the workshop materials?

- 1 - Poor
- 2 - Fair
- 3 - Neutral
- 4 - Good
- 5 - Excellent

3. Did this workshop provide you with new information or ideas?

- Yes
- No

4. Is this workshop something you would recommend to others?

- Yes
- No

What do you recommend to improve this workshop?

Handout 4 for Session 2: Resources for Interactive Whiteboards

Multidisciplinary Resources

http://teacher.scholastic.com/whiteboards/languagearts.htm

http://thinkquest.org/pls/html/think.library

http://spaceplace.nasa.gov/menu/do/

http://www.teacherled.com/

http://eduscapes.com/sessions/smartboard/+

http://teacher.scholastic.com/activities/government/

http://amhistory.si.edu/onthemove/learning/

http://www.discoveryeducation.com/teachers/

http://think-bank.com/iwb/primary.html#science

https://www.google.com/maps/

http://www.whiteboardblog.co.uk/iwb-files/

http://www.edutopia.org/ [click on Browse by Grade Level in the top tool bar]

http://www.tumblebooks.com/ [eBooks – sign up for free trial]

http://www.globalschoolnet.org/ [linking kids around the world]

http://resources.woodlands-junior.kent.sch.uk/

http://www.readwritethink.org/files/resources/interactives/lit-elements/

[Literary elements mapping]

http://edheads.org/

http://www.booksshouldbefree.com/ [free public domain audio & eBooks]

http://pbskids.org/

Handout 4 – page 2

Tools and Guides

http://www.whiteboardblog.co.uk/guides/

http://www.readingrockets.org/strategies/word_maps/

http://www.wordle.net/

http://www.readingquest.org/strat/home.html [reading comprehension strategies]

http://www.algodoo.com

https://bubbl.us/

http://www.readwritethink.org/files/resources/interactives/compcontrast/

[compare/contrast guide]

http://www.readwritethink.org/files/resources/interactives/cube_creator/

[biographies, mysteries, key elements of a story]

http://eduscapes.com/electronic/12.htm [electronic materials for children & adults]

http://eduscapes.com/sessions/power/2.htm [differentiated learning techniques]

http://www.carnegielibrary.org/kids/storymaker/ [My StoryMaker – from the Pittsburgh Carnegie Public Library]

Games

http://www.sheppardsoftware.com/web_games_menu.htm

http://pbskids.org/

Handout 5 for Session 2: Lesson Plan Websites

DiscoveryEducation - http://www.discoveryeducation.com//teachers/

Internet4Classrooms - http://www.internet4classrooms.com/

Digital Learning Day - http://www.digitallearningday.org/learn-and-explore/lesson-portals/

Scholastic Interactive Whiteboard Lesson Activities - http://teacher.scholastic.com/whiteboards/languagearts.htm

Teachers Helping Teachers - http://www.pacificnet.net/~mandel/

TeachersFirst - http://www.teachersfirst.com/index.cfm

Thinkfinity - http://www.thinkfinity.org.lesson-plans

My StoryMaker - http://www.carnegielibrary.org/kids/storymaker/

eThemes from Univ. of Missouri - http://ethemes.missouri.edu/grades?locale=en

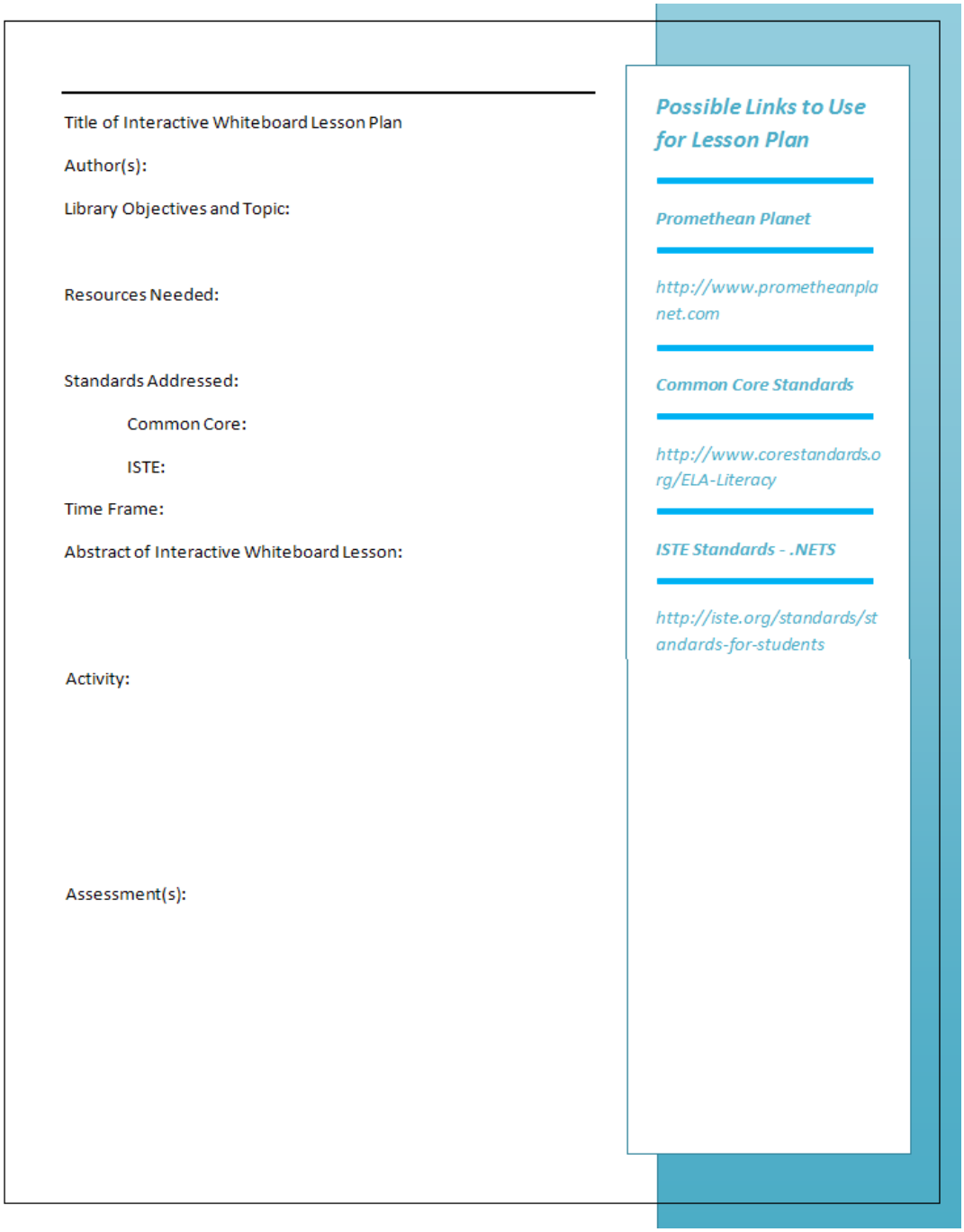
Carnegie Library of Pittsburgh:

- Blast. School Outreach Program: Early Learning Lesson Plans - http://www.carnegielibrary.org/research/parentseducators/educators/blast/earlylearning/programs/LessonPlansAlphabetical.html
- K-5 Thematic Program – theme based booklists http://www.carnegielibrary.org.research/parentseducators/educators/blast/elementary/K5Thematic/abcindex.html

Webquests.org – Creating webquests - http://webquest.org/index-create.php

Whiteboard Blog – IWB files http://www.whiteboardblog.co.uk/iwb-files/

Handout 6 for Sessions 2, 3, 4, and 5: Lesson Plan Template



Title of Interactive Whiteboard Lesson Plan

Author(s):

Library Objectives and Topic:

Resources Needed:

Standards Addressed:

Common Core:

ISTE:

Time Frame:

Abstract of Interactive Whiteboard Lesson:

Activity:

Assessment(s):

Possible Links to Use for Lesson Plan

Promethean Planet

http://www.prometheanplanet.com

Common Core Standards

http://www.corestandards.org/ELA-Literacy

ISTE Standards - .NETS

http://iste.org/standards/standards-for-students

Handout 7 for Session – Sample Lesson Plan

Native Americans – A Visit to Six Native American Tribes

Summary:

Students will compare and contrast the lifestyles of 6 Native American tribes, describing how the environment affected their styles of clothing, the shelters they built, and the food they ate.

Introduction for students:

"You and your classmates will take an imaginary trip to visit six Native American tribes. For each tribe that you meet, you will need to locate on a map where they settled. Describe how they found food, and made their own clothing and shelters using their environments. First, you will fly to the Arctic to spend time with members of the Aleut. In the Northwest, you will meet with the Chinook. In the Southwest, you will talk with the Diné. In the Plains, you will visit with the Lakota. In the Northwest, you will meet the Abenaki, and in the Southeast, you will visit with the Chickasaw.

Author(s): Dr. Alix Livingston (pseudonym for Judith Stanton)

Date: April 11, 2009

Standards Addressed: ELA History/SSCC Standards 3, 4, and 7

Possible Resources:

Library resources: Print or online encyclopedias

Books on Native Americans

Online Resources: www.chinooknation.org;

www.learner.org/interactives/historymap/indians.html

Other resources: Museums, History Centers

Activities:

Students will work in small groups to complete a project to present on the ActivBoard to show their work. The project may be a podcast, a webcast, a video, an interactive whiteboard flipchart, or other types of presentations.

Assessment(s): PowerPoint, webcast, podcast, digital collage, flipchart, or other types of presentations.

Rubric: (see next page for rubric)

Rubric for Social Studies Lesson Plan on Six Native American Tribes			
	Understanding	Analysis & Synthesis	Project
4	Key themes are identified and described.	All data organized, analyzed, and synthesized.	Demonstrated knowledge learned in visual, digital, video, podcast or webcast format.
	Supporting facts provided with few or no inaccuracies.	Demonstrated critical thinking skills to reach logical conclusions.	Presentation showed attention to detail with well-defined organization
3	Key themes are identified and described.	Most data organized, analyzed, and synthesized.	Demonstrated most of knowledge learned in visual, digital, video, podcast or webcast format.
	Supporting facts provided. Some inaccuracies, but most information correct	Demonstrated some critical thinking skills to reach logical conclusions.	Presentation showed attention to detail with well-defined organization with some mistakes
2	Some key themes are identified and described.	Some data organized, analyzed, and synthesized.	Demonstrated little knowledge learned in visual, print, digital, video, podcast or webcast format.
	Most information incorrect	Demonstrated little critical thinking skills to reach logical conclusions.	Presentation showed little attention to detail and poorly defined organization with many mistakes
1	Few to no key themes are identified and described.	Little to no data organized, analyzed, and synthesized.	Demonstrated no knowledge learned in visual, digital, video, podcast or webcast format.
	Information incomplete or lacking.	Demonstrated no critical thinking skills. Reached no logical conclusions.	Presentation showed no organization and numerous mistakes

Handout 8 for Sessions 5 and 6: Samples of Lesson Plan Metadata

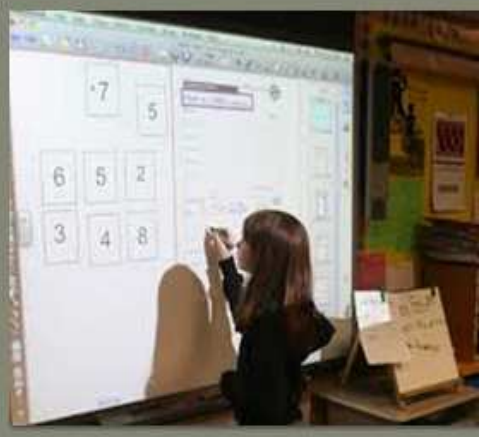
Author:	Dr. Laura Chin (Pseudonym for J. Stanton)
Title:	Civil Rights and Dr. Martin Luther King, Jr.
Created date:	April 11, 2009
Published date:	April 19, 2009
Objective:	Tech history of Civil Rights in US
Topic:	Civil Rights
Genre:	History
Standards:	ELA Literacy/ Social Studies Common Core.RH.6-8.6
Keyword 1:	King, Martin Luther
Keyword2:	Marches
Keyword 3:	Alabama
Summary:	Dr. King's contributions to civil rights in the US.
Activity:	Integrating photos, maps, charts, videos, and graphs with information from print and digital texts, students will research and discuss the contributions of Dr. King.
Assessment(s):	PowerPoint, webcast, flipchart, or digital quilt presentation
Resources:	Books, websites, videos, maps, e-books

Author:	Dr. Alix Livingston (Pseudonym for J. Stanton)
Title:	Native Americans - A visit to Six Tribes of Six Cultures
Created date:	May 2, 2011
Published date:	August 18, 2011
Objective:	Teach awareness of Native American culture
Topic:	Native Americans
Genre:	Social studies
Standards:	ELA History/Social Studies Common Core Standards 3, 4, and 7
Keyword 1:	Shelter
Keyword2:	Food
Keyword 3:	Clothing
Keyword 4:	Aleut
Keyword 5:	Chinook
Keyword 6:	Diné
Keyword 7:	Lakota
Keyword 8:	Abenaki
Keyword 9:	Chickasaw
Summary:	Compare/contrast lifestyles of six Native American tribes.
Activity:	Students will determine how environment affected clothing, shelter, and food for Native American tribes.
Assessment(s):	PowerPoint, Podcast, webcast, digital collage, or flipchart
Resources:	Books, websites, online encyclopedias, videos, maps

PowerPoint Presentation of the Collaborative Professional Development

TEACHING 21ST CENTURY MULTIPLE LITERACIES

Embedding ActivBoards into pedagogical goals



21st Century Skills with ActivBoards

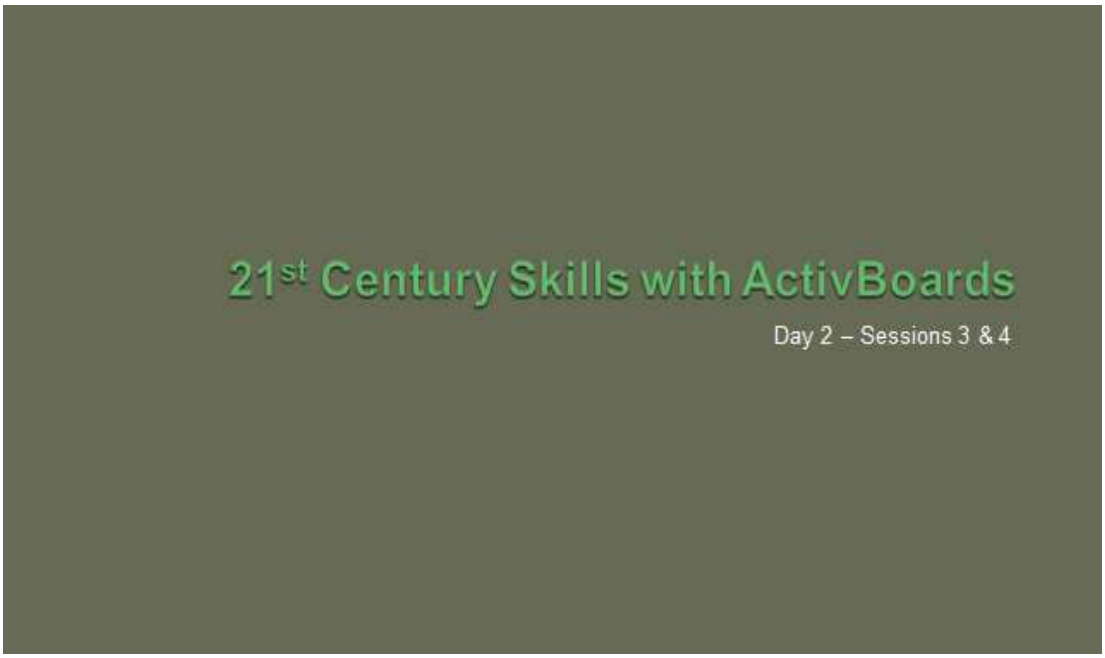
Day 1 – Sessions 1 & 2

Day 1

- Session 1
  - 7:30 – 8:00: Participants should be provided simple refreshments.
  - 7:55 – 8:00: Formative assessment (Handout 1).
  - 8:00 – 8:30: Workshop introduction
  - 8:30 – 9:30: Basic / intermediate training on the ActivBoard (Handout2).
  - 9:30 – 10:30: Small group discussion of best practices of ActivBoards.
  - 10:30 – 10:45: Break
  - 10:45 – 11:30: Large group discussion - Differentiated instruction/best apps.
  - 11:30 – 11:45: Summative assessment (Handout 3) / session wrap up / Q&A.
  - 11:45 – 12:30: Lunch

Day 1

- Session 2
  - 12:30 – 1:30: In small group discussion, the teachers create an ActivBoard lesson using Handouts 4, 5, and 7.
  - 1:30 – 1:45: Break (refreshments, restroom).
  - 1:45 – 3:15: In large group discussion, the attendees will present their lesson plans they created in their small group discussions, using the ActivBoard and other resources or technologies.
  - 3:15 – 3:30: Participants will take the summative assessment followed by the session wrap up and a brief question and answer period.
  - 3:30 – End of day.



Day 2

- Session 3
  - 7:30 – 8:00: Participants should be provided simple refreshments.
  - 8:00 – 9:45: The teacher librarian and a teacher will model a collaborative effort to teach a topic together using Handout 6 (the Lesson Plan template). Ideally, this will be a recap of a collaboration the two individuals have done in the past.
  - 9:45 – 10:00: Break
  - 10:00 – 11:30: Using Handout 6, participants will divide into small group discussions to share their ideas on ways to create opportunities for collaboration with teachers and teacher librarians. They would create a preliminary schedule for collaboration. This could be presented as a deliverable to the administration.
  - 11:30 – 11:45: Participants will take the summative assessment followed by the session wrap up and a brief question and answer period.
  - 11:45 – 12:30: Lunch

Day 2

- Session 4
  - *the participants will focus on objective 5 (creating technology advocates).
  - 12:30 – 1:30: In large group discussion, participants will discuss the creation of interactive whiteboard technology advocates at each grade level. Topics will include best practices for technology adoption and pedagogical integration.
  - 1:30 – 1:45: Break
  - 1:45 – 3:00: In small group discussions, teachers will discuss the best persons to be the technology advocates for coaching and mentoring. The advocates would act as the subject matter experts for both technology and technology-integrated lesson plans.
  - 3:00 – 3:30: Participants will take the summative assessment followed by the session wrap up and a brief question and answer period.
  - 3:30 – End of day.

21st Century Skills with ActivBoards

Day 3– Sessions 5 & 6

Day 3

- Session 5
  - 7:30 – 8:00: Participants should be provided simple refreshments.
  - 8:00 – 8:30: The presenter will discuss the benefits of a repository of technology-based lesson plans, available to all teachers in the school system. Each participant would receive a copy of Handouts 6, 7, 8.
  - 8:30 – 9:30: In large group discussion, the participants will explore what elements of metadata the lesson plan should have. Presenter will record all suggestions on interactive whiteboard.
  - 9:30 – 9:45: Break
  - 9:45 – 11:30: Using Handouts 6, 7, 8, teachers would divide into small groups to discuss the requirements for each lesson plan to be submitted (such as standards addressed, technologies used, author(s), a brief description of the lesson, keywords, grade level).
  - 11:30 – 11:45: Participants will take the summative assessment followed by the session wrap up and a brief question and answer period
  - 11:45 – 12:30: Lunch

Day 3

- Session 6
  - 12:30 – 1:45: The participants will create a preliminary draft of the metadata to be used for the technology-rich lesson plans for the repository. Participants will use information saved on the interactive whiteboard during session 5.
  - 1:45 – 2:00: Break
  - 2:00 – 3:15: Participants will examine what would constitute best practices for the use of the repository. They will discuss content lifecycle management, including review of lessons (to decide what to keep or revise), as well as what to keep. Participants may create a preliminary draft of a charter for the repository, including mission, goals, scope, management, and stakeholders.
  - 3:15 – 3:30: Participants will take the summative assessment followed by the session wrap up and a brief question and answer period.
  - 3:30 – End of day.

Appendix B: Letter Describing Study

November 7, 2012

Dear _____,

You are invited to take part in a research study to explore the benefits and limitations of using interactive whiteboards and what the teacher-librarian/ school/ district could do to promote literacy. You were chosen for the study because you are a teacher-librarian for the xxxxxxxxxxxx School District. As of the writing of this letter, there have been no studies at the doctoral level into how teacher librarians incorporate interactive whiteboards into their curriculum to promote literacy.

If you agree to be in this study, you will be asked to participate in a focus group that will last 45-60 minutes. The date for the focus group will be decided by the participating teacher librarians, and will take place at a time and place that is convenient for you.

You will also be asked to respond to a questionnaire that will take 5-10 minutes of your time. With your signed agreement, the questionnaire will be emailed to your private email account (such as Google Mail or Hotmail) so as to protect your confidentiality. Your participation in this study is voluntary. Any information you provide will be kept anonymous. Your name or anything else that could identify you will not be included in any reports of the study.

Sincerely,

Judith C. Stanton, LMS
Walden University doctoral candidate

Appendix C: Consent Form for Questionnaire

You are invited to take part in a research study to explore the benefits and limitations of using interactive whiteboards and what the teacher-librarian/ school/ district could do to promote multiple literacies. You were chosen for the study because you are a member of the faculty of the xxxxxxxxxxxx School District. Please read this form

and ask any questions you have before agreeing to be part of the study.

This study is being conducted by a researcher named Judith Stanton, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to discuss how the teacher librarians of the xxxxxxxxxxxx School District use interactive whiteboards to support their curricular goals.

Procedures:
If you agree to be in this study, you will be asked to:

- Participate in a questionnaire that will take 5-10 minutes to complete. The questionnaire will be emailed to you, at a personal email address of your choice, such as Google mail or Hotmail, so as to ensure your confidentiality.

Voluntary Nature of the Study:
Your participation in this study is voluntary. This means that everyone will respect your decision of whether or not you want to be in the study. No one in the xxxxxxxxxxxx School District will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. If you feel stressed during the study you may stop at any time. You may skip any questions that you feel are too personal.

Risks and Benefits of Being in the Study:
There are no risks associated with this study. The benefit will be learning more about how teacher librarians incorporate interactive whiteboards into their curriculum to promote literacy.

Compensation:
There is no compensation for being a participant in this study.

Confidentiality:
Any information you provide will be kept anonymous. The researcher will not use your information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in any reports of the study.

Contacts and Questions:
The researcher's name is Judith Stanton. The researcher's faculty advisor is Dr. Edith Louise Jorgensen. You may ask any questions you have now. Or if you have questions later, you may contact the researcher via xxx-xxx-xxxx or xxx.xxx@xxx.xxx. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Director of the Research Center at Walden University. Her phone number is 1-800-xxx-xxxx, extension xxxx.

The researcher will give you a copy of this form to keep.

Statement of Consent:

☐ I have read the above information. I have received answers to any questions I have at this time. I am 18 years of age or older, and I consent to participate in the study.

Printed Name of Participant _____

Participant's Written or Electronic* Signature _____

Researcher's Written or Electronic* Signature Judith Carroll Stanton _____

Electronic signatures are regulated by the Uniform Electronic Transactions Act. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically.

Appendix D: Questionnaire

Use of Interactive Whiteboards by Teacher Librarians

The purpose of this questionnaire is to examine the benefits and limitations of using interactive whiteboards and what the media specialist/school/district can do to promote literacy.

1. How do you use the interactive whiteboard?

- ☐ To teach the use of an online encyclopedia
- ☐ To teach the use of an online dictionary and/or thesaurus
- ☐ To demonstrate how to use the OPAC (library catalog)
- ☐ To demonstrate how to use an online database
- ☐ To demonstrate how to use a Microsoft Office package or other software packages

2. Where do you find your lesson plans for the interactive whiteboard?

- ☐ Promethean Planet
- ☐ Scholastic's SMART Exchange website (http://www.scholastic.com/smarttech/teachers.htm)
- ☐ BrainPOP (http://www.brainpop.com/educators/interactive_whiteboard_resources/)
- ☐ PBSKids Interactive Whiteboard Games (http://pbskids.org/whiteboard/)
- ☐ Other online resources
- ☐ Flipcharts provided by the school system
- ☐ Other resources provided by the school system

3. Have you found an interactive whiteboard to be appropriate for all lessons?

- ☐ Yes
- ☐ Sometimes
- ☐ No

4. I believe the interactive whiteboard encourages an interest in reading in my students.

- Strongly agree
- Agree
- Not sure
- Disagree
- Strongly disagree

5. I feel the interactive whiteboard helps my students with their digital literacy in their use of search engines and browsers.

- Strongly Agree
- Agree
- Not Sure
- Disagree
- Strongly Disagree

6. I help teachers incorporate the interactive whiteboard into their teaching curriculum.

- Always
- Often
- Sometimes
- Rarely
- Never

7. The interactive whiteboard helps my students' media literacy in identifying potential bias in news reports and websites.

- Strongly Agree
- Agree
- Not Sure
- Disagree
- Strongly Disagree

8. If you were to rate your ability to create your own flipchart for the interactive whiteboard, on a scale of 1 to 5, how would you rate your ability? Please circle your answer.

5- Expert

4-Excellent

3-Good

2-Needs Improvement

1-Poor

9. The interactive whiteboard enables me to match my curriculum goals and standards.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Not Sure
- ☐ Disagree
- ☐ Strongly Disagree

10. The interactive whiteboard helps my students with their use of online databases like the Destiny OPAC (Online Public Access Computer) and GALILEO.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Not Sure
- ☐ Disagree
- ☐ Strongly Disagree

11. Do you believe your students are more or less motivated to learn when you teach with

an interactive whiteboard?

- o More motivated
- o Less motivated

No difference in levels of motivation

12. When I teach with the interactive whiteboard, the students...

- ☐ Participate more in in the lesson.
- ☐ Participate about as much as they usually participate.
- ☐ Participate less in the lesson.

13. Teaching with the interactive whiteboard enables me to meet the multiple learning needs of all students.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Not Sure
- ☐ Disagree
- ☐ Strongly Disagree

14. Do you have sufficient resources to use with interactive whiteboard lessons?

- ☐ Always
- ☐ Sometimes
- ☐ Never

15. The students show evidence of extended learning (i.e., asking for more info or doing research on the lessons taught).

- ☐ Strongly Agree
- ☐ Agree
- ☐ Not Sure
- ☐ Disagree
- ☐ Strongly Disagree

16. I have had the training I need to take maximum advantage of the interactive whiteboard.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Not Sure
- ☐ Disagree
- ☐ Strongly Disagree

Appendix E: Focus Group Consent Form

You are invited to take part in a research study to explore the benefits and limitations of using interactive whiteboards and what the teacher-librarian/ school/ district could do to promote multiple literacies. You were chosen for the study because you are a member of the faculty of the xxxxxxxxxxxx School District. Please read this form and ask any questions you have before agreeing to be part of the study.

This study is being conducted by a researcher named Judith Stanton, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to discuss how the teacher librarians of the xxxxxxxxxxxx School District use interactive whiteboards to support their curricular goals.

Procedures:
If you agree to be in this study, you will be asked to:

Participate in a focus group that will last 45-60 minutes. The date for the focus group will be determined by the participating teacher librarians and will take place at a time and place that is convenient to you. The focus group will be audio-taped by the researcher. All responses to the focus group questions will be transcribed and emailed to the participants so that they can verify and/or clarify their responses. The researcher will store all information collected on password-protected flash drives that will be stored in a locked safe at the researcher's home.

Voluntary Nature of the Study:
Your participation in this study is voluntary. This means that everyone will respect your decision of whether or not you want to be in the study. No one in the xxxxxxxxxxxx School District will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. If you feel stressed during the study you may stop at any time. You may skip any questions that you feel are too personal.

Risks and Benefits of Being in the Study:
There are no risks associated with this study. The benefit will be learning more about how teacher librarians incorporate interactive whiteboards into their curriculum to promote literacy.

Compensation:
There is no compensation for being a participant in this study.

Confidentiality:
Any information you provide will be kept anonymous. The researcher will not use your information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in any reports of the study.

Contacts and Questions:
The researcher's name is Judith Stanton. The researcher's faculty advisor is Dr. Edith Louise Jorgensen. You may ask any questions you have now. Or if you have questions later, you may contact the researcher via xxx-xxx-xxxx or judith.stanton@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Director of the Research Center at Walden University. Her phone number is 1-800-xxx-xxxx, extension xxxx.

The researcher will give you a copy of this form to keep.

Statement of Consent:

☐ I have read the above information. I have received answers to any questions I have at this time. I am 18 years of age or older, and I consent to participate in the study.

Printed Name of Participant _____

Participant's Written or Electronic* Signature _____

Researcher's Written or Electronic* Signature Judith Carroll Stanton

Electronic signatures are regulated by the Uniform Electronic Transactions Act. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically.

Appendix F: Focus Group Questions

1- Do you prefer to teach with an interactive whiteboard or without one?

2- Describe benefits you have had in your usage of the interactive whiteboard.

3- Describe challenges you have had in your usage of the interactive whiteboard.

4- What percentage of the time are the students working at the interactive whiteboard, as compared to the percentage that you are teaching in front of it? What balance of teacher-driven to student-driven do you prefer? Why do you prefer that ratio?

5- Please describe the training that you have had on your interactive whiteboard. Describe the benefits and challenges you have had with the training.

6- Tell me about your interactive whiteboard lesson plans. How do you write them? How do you incorporate your curricular goals and the standards in your lessons?

7- How do you share them with other educators? If you do not share, why do you not choose to do that?

8- What would help you to be more successful in teaching with an interactive whiteboard? What would you like to see happen, or what do you feel that you need?

Appendix G: Confidentiality Agreement for Peer Reviewer

Name of Signer: xxxxxxxxxxxx

During the course of my activity as the peer reviewer for this research: "The Use of Interactive whiteboards by Teacher librarians Case Study" I will have access to information, which is confidential and should not be disclosed. I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participant.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.

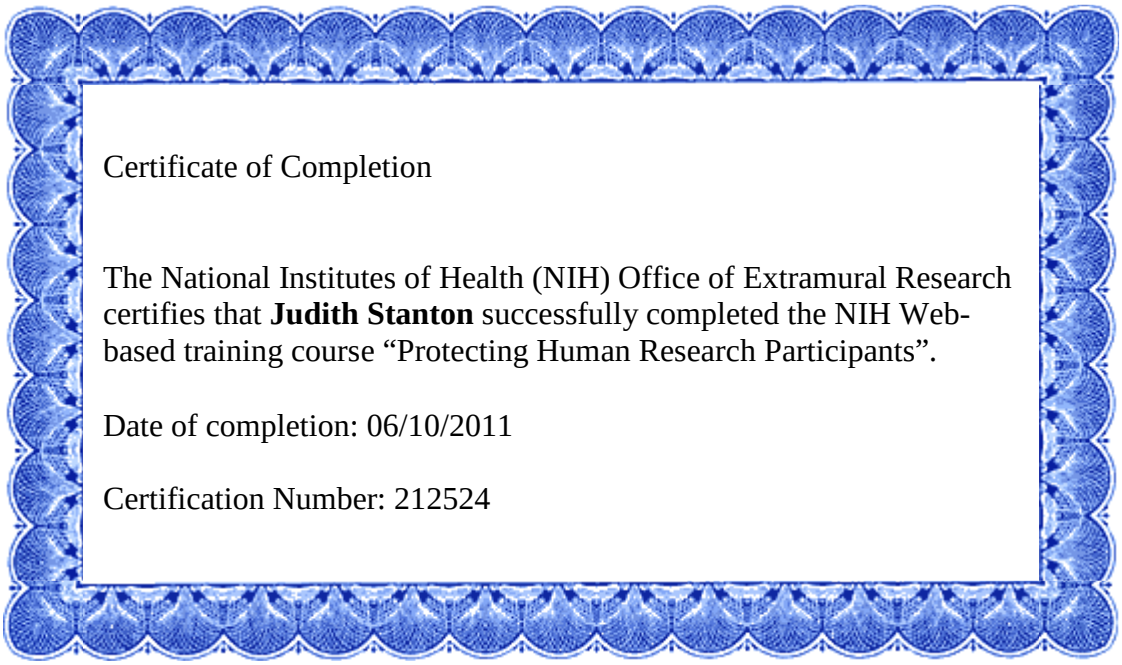
7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature: xxxxxxxxxxxx **Date: 11-2-12**

http://researchcenter.waldenu.edu/Office-of-Research-Integrity-and-Compliance.htm

Appendix H: NIH Certificate of Completion



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Judith Stanton** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/10/2011

Certification Number: 212524

Appendix I: Comparison of the Big 6 and the Super 3 Information Solving Models

Big6 model	Super3 model
1. *Task definition* • Define the information problem. • Identify the information needed.	1. *Plan* • What do I need to do? • What information do I need to do it? • Write a list of questions.
2. *Information seeking strategies* • Determine all possible sources. • Select the best sources.	
3. *Location and access* • Locate sources (intellectually and physically). • Find information within sources.	2. *Do* • Organize your information. • Make something to show what you learned. • Cite your sources—tell where you got your information.
4. *Use of information* • Engage (e.g., read, hear, view, touch). • Extract relevant information.	
5. *Synthesis* • Organize from multiple sources. • Present the information.	3. *Review* • Did I do what I was supposed to do? • Should I do something else before I turn it in? • Do I feel good about what I did?
6. *Evaluation* • Judge the product (effectiveness). • Judge the process (efficiency).	

Figure 1. Generic model of a comparison of the Big 6 and the Super 3 Information Solving Models by Berkowitz, R. E., & Eisenberg, M. Adapted from "Information literacy: The missing link in early childhood education" by K.L. Heider, 2009. *Early Childhood Education, 36*(2), 513-518. Copyright 2009 by Springer.

Used with permission from the author.

Dr. Heider,

May I use your chart comparing the Big 6 and the Big 3 from your article, Information Literacy: The Missing link in Early Childhood Education (Early Childhood Education Journal, April, 2009)?

The teacher librarians in my focus group discussed them during my research for my dissertation on the use of interactive whiteboards by librarians. Your chart would be of great benefit.

Thank you for reading this.

Judith Stanton, LMS
Walden University doctoral candidate

Original E-mail

From : Kelly Heider
Date : 09/27/2013 12:02 PM
To : Judith Stanton
Subject : Re: Requesting permission to use your research

Absolutely, Judith. Good luck with your dissertation research.

Sincerely,
Dr. Kelly Heider
Education Librarian/Associate Professor
Indiana University of Pennsylvania

Curriculum Vitae

Judith Carroll Stanton

Objective:

Adjunct Professor or Assistant Professor in Education or Instructional Technology

Education: Ed.D, Teacher Leadership Targeted graduation February, 2015

Walden University, Minneapolis, MN.

Dissertation topic: An Investigation of Teacher Librarians' Use of Interactive Whiteboard Technology for Literacy Instruction

M.L.T. Library Media Technology, Georgia State University, Atlanta, GA, 1998

B.A. Anthropology, Georgia State University, Atlanta, GA, 1986

Work Experience:

Taught multi-literacies and research skills to students in K-grade 12. Provided professional development to teachers and librarians on best practices for incorporating technology into the curriculum. Demonstrated how to create engaging lessons using Promethean Planet, podcasts, videos, e-books, webcasts, and various websites.

Newton County School System

Library media specialist responsible for training and mentoring students and faculty in skills in technology and multi-literacies. Team leader for all county-wide media specialist training programs for one year. Created library webpages with resources for both faculty and students. Managed student produced morning news show.

DeKalb County School System

Instructed students and faculty in multiple literacies and technology skills. Library media specialist responsible for creation of school webpage and student-produced morning news show.

Jefferson City Schools

Library media specialist in charge of instruction of information literacy skills to students. Updated library management procedures and library catalog. Evaluated, analyzed, and weeded collection. Purchased and cataloged additional resources for media center.

Publications

Stanton, J.C. (2014). Teaching multiple literacies through collaboration. In K. Kennedy & L. S. Green (Eds.). *Collaborative Models for Librarian and Teacher Partnerships.* Hershey, PA: Information Science Reference.

Organization Memberships

American Library Association

American Association of School Librarians