

LIVED EXPERIENCE OF PRIMARY TEACHERS  
USING INTERACTIVE WHITEBOARDS  
IN THEIR CLASSROOM

By

SHAWN KEVIN GREGORY

Bachelor of Music in Music Education

Oklahoma State University

Stillwater, OK

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Thesis Approved:

Dr. Pamela U. Brown

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Thesis Adviser

---

Dr. Hongyu Wang

---

Dr. Kathryn Castle

---

Dr. A. Gordon Emslie

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Dean of the Graduate College

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## CHAPTER I

### INTRODUCTION

I have always been interested in technology. I remember watching the reruns of the original Star Trek wishing I had all the cool technology they had. Gadgets and gizmos have always fascinated me: how do they work? What do you use them for? As a child, I had the early Atari, the handheld electronic games like Simon and Merlin.

As an adult, I was purchased a personal computer and set out to learn everything I could about it, from copy and paste to the Internet. When the school district I work for purchased computers in the late 1990s, they identified a cadre of teachers to serve as teacher leaders in the district. For two years, I was an elementary music teacher by day and a technology trainer after school, training new teachers on Microsoft Word and Power Point. That experience was one of the most enjoyable of my teaching career.

Two years ago, the school district posted a job for a full time technology trainer. I jumped at the opportunity, applied for the job, and was hired. During the first year of this job, our district started purchasing interactive whiteboards, in particular SMART Boards. Part of my job was to design a training program for teachers who received the SMART Board. With some help from a fellow teacher, I created a nine-hour training program.

During this past school year, I conducted once a month trainings and professional development for the teachers who received SMART Boards. At least once a month, I go into their classrooms to observe and help.

I chose to research the topic of the interactive whiteboard in the classroom and the effects it has had on teaching style because I work with the SMART Board and SMART Board teachers almost everyday. What I have never had time to do was fully investigate the impact the SMART Board was making on the teacher's lives. I spend my time looking at the technical side of usage, not the personal or curricular. This study was an attempt to investigate what it is like to have in interactive whiteboard in the classroom.

As the world the world becomes technological, the use of instructional classroom technology is becoming essential in today's classrooms. This paper details a qualitative research study examining the use of interactive whiteboard (IWB) technology in the primary classroom. The purpose of the study was to discover what changes having IWB technology brought to the primary classroom. These changes were explored in relation to the teachers' daily experiences with the technology. The first chapter presents the background of the study, the problem that was studied, why the study was important, and a brief overview of the methodology used in the study.

### **Background**

Before 1801, teachers struggled to find ways to present information visually as they had no method to introduce mathematical concepts, historical references, or written work to the whole class at once. Their students wrote on wooden boards that were covered with black ashes, paint or whose surface was charred. The teacher had to go from student to student and write on each student's board. This was an inefficient, time

consuming task. In 1801, instructor George Baron, while teaching at West Point Military Academy, was believed to have used a large slate board to teach mathematics (Ergo in Demand).

During the 1960s, large sheets of steel coated with green porcelain started to replace the chalkboard in some classrooms. These green “chalkboards” were in use until the 1980’s when the whiteboard (or dry erase board) was introduced to classrooms. By the end of the 1990s, 21% of all American schools had whiteboards instead of blackboards (Ergo in Demand).

A new type of presentational technology emerged in 1991 when SMART Technologies invented the first interactive whiteboard (IWB), which they named the SMART Board (SMART Board Interactive Whiteboards). IWB technology was originally developed for presentations in the business world and came of educational use in higher education. Today IWBs are available from many different companies such as Promethean, Mimio, SMART Technology, and Hitachi. IWBs are now being used in schools “as a pedagogical tool for promoting whole class teaching” that experts predict will be in every classroom of the future (Smith, Hardman, & Higgins, 2005, p.91). The end of the 1990s saw IWBs being used in classrooms in Great Britain while the use of the IWB in the United States for classroom instruction is a more recent development.

IWBs have an advantage over both chalkboards and whiteboards in that “they have the potential to enhance demonstration and modeling” (BECTA, 2005, p.2). An interactive whiteboard is a touch-sensitive display that connects to a computer and a digital projector. Through this connection a person can control computer applications, write notes in digital ink, present lessons, and save all work to be shared later (SMART



Board Interactive Whiteboards). By using the software that accompanies the IWB, Kennewell (n.d.) reported a teacher could imitate non-digital technologies such as flip charts, dry erase boards, slide projector, and overhead projectors.

### *IWB Research*

Research on the use of Interactive Whiteboards in the classroom is a budding field. Smith, Higgins, Wall, and Miller (2005) wrote, “The available academic literature is limited and emerging only slowly” (p. 91). Two main categories of research have emerged from their study of the literature “the IWB as a tool to enhance teaching and as a tool to support learning” (Smith et al., 2005, p.91).

It has been reported that teachers using an IWB have changed their pedagogy, from presentation of material to preparing lessons for use on the IWB. Higgins, Beauchamp, and Miller (2007) wrote, “as teachers become more fluent in their use of IWB and as they recognize the link to pedagogical change, the IWB becomes a potential catalyst for further change” (p.217). According to Higgins et al. (2007), providing successful pedagogical interactive lessons requires teachers to plan structured lessons.

### *Self-Efficacy*

Teacher self-efficacy in relation to technology may be another influence of having the IWB in the classroom. There is some evidence that when instructional classroom technology is effectively entrenched into the classroom, “teachers embraced learning for themselves while using the technology to transform their knowledge of their subject areas and develop, expand and adjust their teaching repertoire” (Sutherland et al., 2004, p. 420). Smith et al. (2005) wrote, “Teaching from the front of the class with the aid of a board is a familiar...stance for most teachers. This is claimed to support more

‘technophobic’ teachers to engage with IWBs and integrate instructional classroom technology into their lessons” (p. 94).

### **Problem Statement**

The purpose of this study was to discover in what ways a teacher’s practice changed when an IWB was employed in his or her classroom. “Many teachers are likely to use an IWB as an extension of their non-digital whiteboard” (Armstrong, Barnes, Sutherland, Curran, Mills, & Thompson, 2005, p. 458), which means IWBs are generally not being used interactively.

#### *Research Questions:*

Drawing on my experiences working with teachers who are using an IWB in their classroom, I formulated the questions I have not had time to research in the course of my job.

1. What is the experience of having an Interactive Whiteboard in a primary classroom like for teachers?
2. How has having an Interactive Whiteboard shaped teaching and learning in the teacher’s classroom?
3. What role does having advanced technology in the classroom play in a teacher’s technological development?

### **Professional Significance**

The study of technology in the classroom is becoming more important as technology begins to permeate our society. Today’s students live in a technological world where information is available at the click of a button. Prensky (2001) said, when writing about today’s students, “Our students have changed radically. Today’s students

are no longer the people our educational system was designed to teach” (p.1). They have spent more hours playing video games and surfing the Internet than reading books (Prensky). As educators, we need to acclimate to this rapidly changing technological world. One way to do this is by utilizing IWB technology in the classroom, taking advantage of a more interactive learning environment.

It may not be necessary for every teacher to have in IWB. Some teachers might integrate technology into their classroom by having a digital projector attached to their computer, giving them and their students’ access to the media available on the Internet. Sutherland et al. (2004) warned of unsuccessful technology usage when teachers somehow believed that content knowledge was embedded within the software believing the technology itself was doing the teaching. This examination into the lives of teachers who use the IWB will show that knowledge exists within the teacher, not technology.

By researching the experiences of teachers using an IWB in their classroom, teachers without one will be able to get a glimpse into how the IWB has changed everything from their teaching style to the time they spend lesson planning. Administrators can read the research to view how the IWB has changed their teachers, getting a hint of their classroom world.

In an article published in *The Journal of Computer Assisted Learning* Sutherland et al. (2004) commented, “the interactive whiteboard has a potential role to play in conjoining the teacher’s ‘personal curriculum’ to the knowledge of students in classroom settings” (p.420).

Lesson planning for the IWB initially takes more time to prepare but once lessons are created, they can be modified and re-used for many years. Lessons using the IWBs

can cover more material than lessons where an IWB is not used (Smith, Hardman & Higgins, 2005).

Research conducted on the effects of using IWBs in the classroom has been found to be inconclusive with some research being very positive and other research raising questions about the positive benefits of IWBs. Because widespread use of the IWB for classroom instruction in education is a fairly new development, it may take many years before a body of research is established. My research may be of interest to educators and school systems facing the dilemma of how best to spend thousands of dollars purchasing technology for use in classrooms.

### **Methodology**

A general frame of qualitative research was used for this study for the reason that the methods and techniques involved are interviewing, observing, and analyzing data, which fit my research questions (Merriam, 1998). Because the research was a study of the lived experiences of teachers instructing students using IWB technology, the qualitative research was phenomenological (van Manen, 1990). The methods involved with phenomenological research, as described by van Manen (1990), are the interaction among the activities of turning to the nature of a lived experience, investigating the experience, reflecting on essential themes, writing and rewriting, maintaining an oriented relation to the question, and balancing the research by considering parts of the question. Van Manen (1990) called this research of the lifeworld *human science research*.

Van Manen (1990) identified four existential themes “which probably pervade the lifeworlds of all human beings” (p.101). Observations and interviews were conducted with these four existentials of spatiality, corporeality, temporality, and relationality or

communality as a guide (van Manen). In phenomenological research, “the interview serves very specific purposes: it may be used as a means for exploring and gathering experiential narrative material” to develop an understanding of human experience (van Manen), which in this case was the experience of using an IWB. Close observation is another way of gathering information about the lived human experience by allowing the researcher to enter and participate in the “person’s lifeworld” (van Manen, p. 69). Classroom observation allows the researcher to “notice things that have become routine to the participants themselves, things that may lead to understanding the context” (Merriam, 1998, p. 96).

Because of its strength in choosing information-rich cases for study (Patton, 1990, as cited in Erlandson et al., 1993), purposive sampling was employed to choose research participants. Expertly chosen teachers were invited to participate in this research project via email. A detailed analysis of methodology will be given in Chapter 3.

### **Delimitations**

There were delimitations to this study with one being a lack of generalizability with the study’s findings. One factor that may lead to lack of generalizability is that although the study looked at the impact of an IWB on the teacher and contained classroom observations, no students were interviewed, and no observations were recorded concerning students, with the limitation being that the study relied on teacher and researcher opinions and observations. Because teacher interviews were conducted with just three teachers, this could contribute to the lack of generalizability.

The boundaries of the study could be seen as delimitation. This study was conducted in primary schools and did not take into account usage of IWBs in a secondary

or higher education setting. Because of limited time in which to conduct the research, the study contained observations and interviews with only three teachers.

### **Conclusion**

I started this chapter by describing my life long interest in technology. That was followed by a discussion of the background of presentational tools in education from the chalkboard to interactive whiteboards. Self-efficacy theory was briefly addressed in reference to teachers' using the interactive whiteboard. After these sections, I stated my problem statement and research questions followed by an exploration of the professional significance of the study. The next two sections gave a brief discussion of the methodology and delimitations involved with the research. In the next chapter, I review the professional literature pertaining to instructional classroom technology, interactive whiteboards, and self-efficacy.

## CHAPTER II

### REVIEW OF LITERATURE

As classroom technology develops, teachers are presented with more ways to present information. A recent technological development for classroom use is the interactive whiteboard (IWB) a touch-sensitive display that connects to a computer and a digital projector. Through this connection, a person can control computer applications, write notes in digital ink, present lessons, and save all work to be shared later (SMART Technologies). Because of the pedagogical possibilities an IWB affords, teachers who use them in the classroom may change everything from their presentation of materials to lesson preparation. The IWB could develop into a vehicle for changes in the ways a teacher plans lessons, presents material, paces lessons, collaborates with other teachers, and develops technological skills. However,

Good teaching remains good teaching with or without the technology; the technology might enhance the pedagogy only if the teachers and pupils engaged with it and understood its potential in such a way that the technology is not seen as an end in itself but as another pedagogical means to achieve teaching and learning goals. (Higgins, Beauchamp, & Miller, 2007, p.217)

#### **Instructional Classroom Technology**

With the advances in technology, teachers are being asked to integrate technology into

their lessons at an ever-increasing rate. Today's teachers have access to multiple types of technology including iPhones, iPods, flash drives, digital books, text messaging, document cameras, and personal laptop computers. Teaching in today's world does not necessarily mean using a chalkboard or over-head projector for instruction, which for some teachers means learning to use IWB's in their classroom. Albion and Ertmer (2002) wrote that teachers would integrate technology if they know how the technology can improve student learning.

### *Socio-Cultural Learning Theory*

For many researchers, information and communication technology use in the classroom draws upon a socio-cultural theory of learning (Sutherland, Armstrong, Barnes, Brawn, Breeze, Gall, et al., 2004.). According to Sutherland et al., a central aspect of the socio-cultural theory is that tools, in this case instructional classroom technology, mediate all human action. All technological tools are created within a particular socio-cultural setting where their use is determined by the culture in which they originated (Sutherland et al.).

Underlying socio-cultural theory is the fact that students and teachers bring their own perspectives to any learning environment and construct knowledge based on what they already know (Sutherland et al., 2004). Schmid (2006) reported that each piece of classroom technology is "constructed" by the relationship between its design and use. Additionally, the socio-cultural setting in which a technological tool is developed can change because of the use of the technology. An example of this is the IWB, which was developed for business presentations and whose potential for use in primary education not recognized until the late 1990s (Higgins et al., 2007). By using an IWB in the



classroom, teachers “encourage an interactive environment wherein pupils actively participate in the social (re)construction of knowledge and understanding is presented as a means to transform educational practices” (Smith, Higgins, Wall, and Miller, 2005).

### *Instruction using Technology*

Successful use of instructional classroom technology is a balance between the tool being highly visible in the classroom but not so visible that it renders the subject invisible (John, 2005). The focus must still be upon the lesson being taught, not the flashy new tool or toy in the classroom. Until the newness of the tool wears off, teachers of children who are easily distractible may need to find ways to engage the students in the learning process.

According to John (2005), three conditions must exist before teachers use technology well: the teacher needs to be certain that using the technology will meet educational objectives; they need confidence in their technological skills; and they need to be certain that using instructional classroom technology will not distract from learning objectives. For this to occur, teachers will need ongoing training on how to use instructional classroom technology in the classroom. A criticism of instructional technology in the classroom is teachers who take informational technology courses and do not practice the skills they learn, which is inadequate training for continued good practice and could lead to the belief that the technology would do the teaching and merely having the technological tool in the classroom will lead to learning (Slay, Sieborger, and Hodgkinson-Williams, 2008; Sutherland et al., 2004).

Kennewell and Morgan (2003) report that evidence exists linking instructional classroom technology to the beneficial characteristics associated with whole class

learning claiming the IWB as the most effective tool in facilitating this type of learning. However, IWB use alone will not bring about changes in whole class teaching (Smith, Hardman, and Higgins, 2005). If there are classroom management issues, teachers may not use the IWB to its potential (O'Sullivan, 2008). One caveat is that whole-class teaching with IWB may be detrimental to individual student instruction (Mahon, 2008) because the teaching never focuses on the individual needs of the student.

### **Interactive Whiteboards**

There are many reasons why teachers use IWBs in their classroom. Teachers use IWB's to: save time writing by preparing the presentation beforehand, display text and pictures large enough for all children to see, increase student interactivity during the lesson, retain student attention, and provide images or text that may not otherwise be seen (Kennewell and Higgins, 2007). The IWB gives teachers the ability to create interactive and imaginative lessons that keep the students' attention, motivates them to learn, and aides in concentration (Cogill, 2004; Wall, Higgins, & Smith 2005). Warwick and Kershner (2008) support this idea adding that the IWB helps students gain understanding of a lesson, and categorize information. All of these benefits are linked to the software used with the IWB (Armstrong, Barnes, Sutherland, Curran, Mills, & Thompson, 2005), which in this study is the SMART Board and the accompanying software, SMART Notebook.

Interactivity, a reported benefit of IWB use, can be defined in many different ways with a common definition being the give and take between teacher and student that leads to learning and on the IWB gives users the ability to be in command of the computer by touching the screen (Armstrong, Barnes, Sutherland, Curran, Mills, &

Thompson, 2005; Smith, Higgins, Wall, and Miller, 2005). For kinesthetic learners, the physical and tactile properties of the board help to reinforce their learning by giving them this hands-on activity (Smith et al.; McCormack & Ward, 2003).

Not all research on IWBs in the classroom is positive. According to Smith et al. (2005), “there is insufficient evidence to identify the actual impact of such technologies upon learning either in terms of classroom interaction or upon attainment and achievement” (p.91). Smith et al. write one reason for this may be the quality of the interactive lessons and the quality of the students’ participation in that lesson. Another negative aspect of this technology occurs when teachers are not fully trained on the IWB and its software. Wall, Higgins, and Smith (2005) interviewed students in classrooms with IWBs and discovered that some students thought the pace of the lesson was decreased by their teachers poor skills. Warwick and Kershner (2008) claim that students could become preoccupied with the images and animation on the IWB and with the pen tray or eraser causing them to lose interest in the lesson. This seems to be true when the IWB is first placed in the classroom. There is a danger that teacher will use the IWB solely as a presentational platform or video screen and not as a resource for promoting questioning and interactive learning, (Beauchamp, 2004).

### **Interactive Whiteboards and Pedagogy**

Instructional classroom technology can lead to changes in pedagogy and instruction that are a reflection of a teacher’s personal philosophy of teaching (Mahon, 2008). When teachers become aware of the IWB’s potential to change and enhance their practice, they may start to merge their skills as educators with the skills and knowledge of their students and create a new pedagogy, but they need time to engage with the IWB

(Beauchamp, 2004; Slay, Sieborger, & Hodgkinson-Williams, 2008). John and Sutherland (2005) warn of the IWB enhancing interest in the technology itself rather than persuading the teacher to create a new pedagogical approach to learning by finding uses where the technology fits their current practice and enhances the pedagogical objectives and not the other way around (Slay, et al., 2008; Warwick and Kershner, 2008). In this instance, the technology is more important than the curriculum.

Albion and Ertmer (2002) write that some teachers with advanced technological skills and who use classroom technology have a constructivist educational philosophy. John (2005) found that changes that took place in a teacher's practice were linked to a constructivist philosophy with the technology guiding them to student-centered teaching enabling them to follow their students' interests and quest for knowledge.

### **Lesson Planning for the Interactive Whiteboard**

When presented with a new curriculum or teaching tool, educators spend a great deal of time preparing lessons, including lessons for the IWB. Higgins, Beauchamp, and Miller (2007) found lesson planning for the IWB takes longer in the beginning, decreasing as the teacher becomes more technically proficient with the board and the software. Beginning IWB users need more time to plan and research lesson resources and search for or create interactive content (Green, 2005; Kennewell, n.d.). They also need the extra time to plan structured lessons that use a variety of the features of the IWB which leads to effectual lesson interactivity; however, this extra time could be reduced in the future because of the capability to save and re-use lessons (Higgins et al., 2007; Kennewell, n.d., Mahon, 2008).

## **Instruction using the Interactive Whiteboard**

IWBs are used interactively to facilitate whole class learning, dialogic teaching, and effective questioning by teachers and students. For the IWB to be used interactively, the teacher needs to recognize it can be used this way and to integrate the use of the IWB software with the lesson objectives (Armstrong et al., 2005). Interactivity during a lesson, however brief, can ensure that multiple students get a turn using the board, which might lead to increased focus among the students (Preston & Mowbray, 2008).

Advocates of IWB in the classroom argue that physical interaction with the board results in understanding lessons on a deeper cognitive level, and this happens when the teacher plans the interaction as an integral part of the lesson (Beauchamp, 2004).

IWBs could lead to a more dialogic and interactive approach to instruction because it promotes more teacher-student interaction helping to create more teachable moments (Kennewell & Higgins, 2007; Smith et al. 2006). In the dialogic classroom teachers and pupils discuss the objectives together, listen to each other when sharing knowledge with each considering alternative viewpoints, and build on each other's ideas linking them to create the lesson's outcome (Smith, et al., 2006). Interactivity is sustained through questioning between teacher and students making dialogic teaching essential to using an IWB in the classroom (Higgins, Beauchamp, & Miller, 2007; Schmid, 2006).

## **Interactive Whiteboards and Learning Styles**

Interactive whiteboards show promise in meeting the needs of the many different learning styles and learning modalities of students because teachers can incorporate a variety of media and material into a lesson (Beeland, 2002; Glover & Miller, 2001).

When using an IWB, a teacher can provide information in a manner based on three modalities of learning: visual, auditory, and tactile (Beeland, 2002; Preston & Mowbray, 2008). Visual learning comes about from the teacher's use of text, pictures, animation, and video. Auditory learning is supported when the teacher's include speech, music, or sounds in the lesson. The needs of tactile learners are met when students touch the board (Beeland, 2002).

In classrooms where IWBs are used, students report that the most valued ability of the IWB is the visual aspect, the ability to see lesson content on a large scale (Wall et al., 2005). The capability to flip back and review material is especially advantageous to learners who have special needs or lower abilities (Smith, Higgins, Wall, & Miller, 2006).

### **Technological Self-Efficacy**

In order to use classroom technology effectively, teachers must have either technological skills or enough confidence to learn new skills. Beauchamp (2004) states that teachers need to have the following computer proficiencies before beginning use of an IWB: ability to move around the operating system; open files and save them; manage files; click and drag objects; minimize and maximize windows; switch between open programs; use different graphics; capability to use Internet search engines; and organize web pages by saving to favorites or bookmarks folder. Having belief in their computer skills is seen as an important qualification for teachers to use the IWB successfully, and without this belief, teachers are inclined to avoid using them (Beauchamp; Green, 2005).

### *Self-Efficacy Theory*

Self-efficacy theory can be used to predict how well a teacher will use IWB in their classroom. According to Bandura (1997), self-efficacy theory refers to a person's belief in their personal success and abilities, in this case their technological skills (as cited by Albion & Ertmer, 2002, p. 35; Kennewell and Morgan, 2006). The most influential source for self-efficacy information is mastery of an experience (Bandura, 1986, cited by Kennewell et al.), which in this study would come from use of the IWB.

Most people only attempt tasks that they think they are capable of accomplishing using their self-efficacy beliefs to guide their choices and actions (Bandura, 1997 as cited by Green, 2005). Green explains that people who have high self-efficacy are self-motivated, respond to criticism by working to improve their actions, and are capable of learning from others, and people who have a low self-efficacy are more likely to give up on a task. Self-efficacy with technology is not the same as self-esteem. A person who has a self-efficacy with technology may be more adapt at using technology than a person with self-esteem or confidence, with technological self-efficacy shown to be a better predictor of developing ICT skills than self-esteem (Kennewell et al., 2006).

### *Technological Self-Efficacy in the Classroom*

Green (2005) wrote that teacher efficacy regarding instructional classroom technology is correlated to the teacher's personal attitude about informational technology in the classroom, best practices, and total efficacy. Green also stated that teachers with high levels of confidence are less anxious about using instructional technology in their teaching while teachers with little familiarity with instructional technology and low confidence are not able to be self-reliant and often prefer to learn technological skills on a

“need to know” basis (Granger et al. as cited by Smith, Higgins, Wall, and Miller, 2005, p.98).

There are several ways for teachers to gain confidence and technological efficacy. Warwick & Kershner (2008) report that teachers need professional development opportunities that integrate curriculum and pedagogy with technical skills necessary to become confident instructional classroom technology users. When teachers see a correlation between lesson delivery and technological tools such as an IWB, they are able to integrate the technology into their subject area and expand their teaching repertoire (Sutherland, Armstrong, Barnes, Brawn, Breeze, Gall, et al., 2004). Another way to increase teachers’ confidence with instructional classroom technology in their curriculum is through play. Kennewell and Morgan (2006) state that technological skills are largely developed through “playing around” which may help to increase a teacher’s confidence in their ICT abilities (p.266). According to Green (2005), teachers also need time to work collaboratively to learn and practice their skills, leading to an increase in confidence and self-efficacy.

### **Conclusion**

This chapter reviewed the literature pertaining to classroom technology, in particular the IWB in the classroom. The literature concerning the IWB was divided into sections dealing with the IWBs’ influence on lesson planning, pedagogy, learning styles, and teacher technological self-efficacy. The focus of the following chapter is on the methodology employed while conducting this research study.



## CHAPTER III

### METHODOLOGY

This chapter will describe the methodology used in conducting this research on teachers using interactive whiteboards (IWB). In keeping with qualitative design, the research method has evolved over the course of conducting this study. This chapter will include a perspective of the methodology, a description of the research context and participants, the instruments used for collecting data, the procedures carried out, and an analysis of the data.

Before describing the research, it might be helpful to review what an interactive whiteboard is and what it can do. The interactive whiteboard is an electronic whiteboard that can display the image from the computer screen and can be operated as a touch screen allowing the user to manipulate images and text. The IWB can vary in size from small to large and are usually wall mounted or attached to a stand. Touching the whiteboard can control the user's computer. Most interactive whiteboards use a projector connected to a computer to display the images on the computer screen, although rear-projection IWBs are available (Preston and Mowbray, 2008; SMART Technologies).

## **Research Perspective**

Qualitative research was best suited for my research questions because the methods and techniques involved in it are interviewing, observing, and analyzing data (Merriam, 1998). Simply put, research about teaching and what happens within a school and classroom setting “is often more qualitative than quantitative” (Chiseri-Strater & Sunstein, 2006, p.21). Conducted in my own teaching setting, this research is a type of teacher inquiry or action research wherein the researcher tries to capture a “snapshot” of life in the classroom (Chiseri-Strater & Sunstein). In this case, the snapshot tried to capture the lived experience of teachers using Interactive Whiteboards in their classrooms. My research was looking for what was unique, interesting, or curious in the lives of these teachers in terms of their use of IWBS. Although I work with these teachers regularly, during the classroom observation part of this research I was able to focus on my research questions and collect data related to their lived experience.

The term qualitative research is the initial category under which many sub-categories of research live (Merriam, 1998). The form of qualitative research I plan to conduct is phenomenological, specifically van Manen’s (1990) human science research. The key concern of qualitative research is to understand the phenomenon from the participants’ viewpoints, not the just the researchers (Merriam). Phenomenology is a “school of philosophical thought that underlies all of qualitative research” because it is a study of a person’s experience (Merriam). Van Manen (1990) stated that phenomenological research is a study of the lived world experiences in everyday situations and relations.

According to van Manen (1990), phenomenological research studies a person's lived experience while also trying to explain phenomena as related to the participant. George Willis held that phenomenological inquiry "is that form of interpretative inquiry which focuses on human perceptions, particularly on the aesthetic qualities of human experience" (Willis, 1991, p.173). I studied classroom teachers' lived experience with the phenomena of having an IWB, in this case a SMART Board, in their classroom. Max van Manen in his book *Researching Lived Experience* (1990) wrote about the phenomenological researcher being a scholar sensitive to intricacies of everyday life as they relate to the researcher's interest.

In this study, I looked at all the above as it pertains to the lived experiences of teachers who have IWBs in their classrooms. The methods of phenomenological research are the interaction among the activities of turning to the nature of a lived experience, investigating the experience, reflecting on essential themes, writing and rewriting, maintaining an oriented relation to the question, and balancing the research by considering parts and whole of the question (van Manen, 1990). These methods were suitable to the research questions because I investigated the participants' experience teaching with the IWB and reflected on essential themes or commonalities among their experiences, always remembering the research questions. Once these were found, I wrote and rewrote to discover my findings.

Observations and interviews were conducted through the framework of the four-lifeworld existentials of spatiality, corporeality, temporality, and relationality because "these are productive categories for the process of phenomenological question posing, reflecting and writing" (van Manen, 1990, p. 101 – 102). Van Manen explained (1990)

spatiality or lived space as being felt space. The existential of lived body or corporeality examined the feelings and emotions associated with IWB and classroom technology. Temporality or lived time looked at the perception of time both when creating lessons for the IWB and when using it. Relationality or lived other assessed the relationships the teacher has with students while using the IWB, the relationship the teacher has with other colleagues who use an IWB, and the relationships with teachers who do not have an IWB in their classroom.

### **Research Context**

This research study was conducted using interviews and observations of three elementary school teachers who use a SMART Board in their classroom. These educators work in a small college town in the south-central part of the United States. The school system in this town is comprised of six elementary schools, a middle school, a junior high school, and one high school. The district has approximately 320 teachers who serve roughly 5400 students. Two of the participants, Felicia and Cynthia, work in a lower class to lower-middle class Title I elementary school. The other teacher, Patricia, works in a middle to upper class elementary school. All the elementary schools serve Pre-Kindergarten to fifth grade students.

This past year the district started purchasing SMART Boards for teachers in elementary schools. In May of 2008, fifteen teachers were selected to receive SMART Boards through an application process where the teachers described how they planned to use the IWB. These teachers went to three three-hour trainings during the summer and began using their SMART Boards in their classroom in the fall of 2008.

## **Research Participants**

Purposive sampling was used to choose participants for this study. “Purposive sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned” (Merriam, 1998, p. 61). The strength of purposive sampling lies in choosing information-rich cases for study (Patton, 1990).

Participants were selected using a type of purposive sampling called expert sampling. “Expert sampling involves the assembling of a sample of persons with known or demonstrable experience and expertise in some area” (Trochim, 2006). These expertly chosen participants were invited to participate in the study via email. For the purpose of this study, pseudonyms replaced real names.

Felicia has been teaching for 29 years. She teaches Pre-Kindergarten in a Title I elementary school. Felicia holds a Bachelors of Education in Elementary Education and Early Childhood Education. She is a National Board Certified Teacher in Generalist/Early Childhood. Felicia is in her fifth year in her present teaching position. Before this assignment, Felicia taught in a small rural school. She has been using the SMART Board since the beginning of the school year, about seven months ago.

Cynthia teaches at the same school as Felicia. She has been teaching for eight years and is in her second year in her current assignment. Cynthia holds a Bachelors of Education in Elementary Education and a Masters in Educational Administration. Cynthia is also a National Board Certified teacher with certification as Generalist/Middle Childhood. Cynthia came to her district with two year’s experience using an IWB and has now been using an IWB for a total of four years.

Patricia works in a middle class – upper class elementary school. She has been teaching for 14 years. She holds a Bachelor’s in Elementary Education and a Master’s in Curriculum and Instruction with an early childhood specialization. Patricia too is a National Board Certified teacher with certification as Generalist/Middle Childhood. Patricia has been using her IWB since the school year started about seven months ago.

### **Data Collection**

Qualitative research consists of information gathered through in-depth interviews and observation and includes direct quotes from the participants (Trochim, 2006). Data were collected through interviews with the participants and through classroom observation. In phenomenological research, “the interview serves very specific purposes: it may be used as a means for exploring and gathering experiential narrative material” to develop an understanding of human experience (van Manen, 1990, p. 66), which in this case is the experience of using an IWB.

The semi-structured interviews were between 45 minutes and 60 minutes long. I started the interview with the following list of likely interview questions:

1. What does it mean to you to have a SMART Board in your classroom?
2. What does the IWB do to the perceived space in your classroom?
3. How has the climate in your classroom changed since you have had a SMART Board?
4. Tell me about your comfort level, nervousness when using the SMART Board?  
Do you feel a difference from when you first started using it?
5. Describe how your routine or teaching style has changed since using the SMART Board?

6. What is your perception of time when using the SMART Board in your classroom? Does time move slower, faster?
7. Has your perceived or real time changed in regards to planning lessons? In regards to teaching lessons?
8. How has a SMART Board affected your interactions with students?
9. Describe the effect having a SMART Board has had on your relationships with the teachers in your building who do not have a SMART Board.
10. Describe your relationship with other teachers who have SMART Board.

Each participant chose where and when the interview took place. Felicia's interview took place on a Sunday afternoon in her classroom; Cynthia's interview took place after school in her classroom; and Patricia's interview took place in her classroom during a school day when her students were out of the room in physical education. Each interview was recorded on a digital recorder and then transcribed by the researcher. Short follow up interviews were conducted with each of the participants to for the purpose of clarification.

Close observation is another way of gathering information about the lived human experience by allowing the researcher to enter and participate in the "person's lifeworld" (van Manen, 1990, p. 69). As a researcher, observation will allow the researcher to "notice things that have become routine to the participants themselves, things that may lead to understanding the context" (Merriam, 1998, p. 96). Observations took place in each of the participants' classrooms during the school day at a time of the participants' choosing. The teachers' use of the SMART Board was observed in relation to lesson content, the way they touched the board, and their proximity to the SMART Board.

These observations were recorded as field notes in the researcher's notebook. In addition, a simple sketch of each classroom arrangement was recorded.

### **Permissions and Ethics**

Permission was obtained from a variety of sources in order to conduct this research study. The Institutional Review Board (IRB) at the university gave permission to conduct the research. The school district in which the study took place received a letter and a copy of the research proposal asking permission to conduct the research. The district was assured that all names will be kept confidential or pseudonyms used in the writing of study, and no notes or comments would be made about individual students. The superintendent of the district approved the research by sending me a letter, a copy of which was sent to the Institutional Review Board.

I sent an email to 18 potential participants asking them to participate in the study. Of those 18, three were expertly chosen for observation and interview because they were adapt and committed to finding ways to use the IWB to enhance their practice and engage students. The participants a signed informed consent form, which stated I was not studying them personally or their teaching methods but was specifically studying their use of the IWB.

### **Ethical Issues**

Merriam (1998) warns that when collecting data and disseminating results ethical dilemmas are likely to occur. Ethics is always a concern when conducting any type of research. In writing about research, Alderson et al. (1993) call "a code of ethics a series of safeguards to protect subjects...from the research" (p. 155). Ethical guidelines are



designed to protect subjects' privacy and confidentiality, to keep them from harm, and to give the participant informed consent (Alderson et al., 1993).

Besides the benefit of an interpersonal relationship being established, interviewing carries with it some risks. Research participants may feel their privacy has been violated, be embarrassed by some questions, or reveal things they did not intend to reveal (Merriam, 1998). The main ethical issues related to this research, as with any research that involves observations and interviews, is consent. The researcher needs to be cognizant of participants' feelings. If at any point potential participant opts of the research for any reason, then their wishes need to be acknowledged. The research must be done on a voluntary basis with no coercion towards potential participants.

Consent forms were kept separate from all data so as not to reveal participant identities. The interviews with the participants were recorded with only the researcher having access to those recordings. These interviews were transcribed, and the recordings were erased after thesis completion. Observations were kept in a journal, which was stored in the researcher's home.

The participants were given the opportunity to review the transcripts and the findings. This is to further protect them from harm that may occur and to make sure no misrepresentation of the facts has indeed occurred.

### **Data Analysis**

Thematic analysis was used to analyze data. Van Manen (1990) defines a theme as the focus or meaning of an anecdote that "describes an aspect of the structure of lived experience" (p. 87). Forming a thematic knowledge of a human experience is not a rule-bound process that is learned or taught but "a free act of 'seeing' meaning" in text or

lived experiences (van Manen, pp. 79, 88). “ ‘Theme analysis’ refers to the process of recovering the theme or themes” that are seen in the structures of experience (van Manen, 1990, p. 79).

Thematic statements can be found through reading transcripts of interviews, in written observations, and in the writings found in journals and other sources. Van Manen (1990) describes “three approaches toward uncovering or isolating thematic aspects of a phenomenon: (1) The holistic approach; (2) the selective or highlighting approach; (3) the detailed or line-by-line approach” (p. 92 – 93).

In reading my observations and the transcripts of the interviews, I used two of these approaches: the holistic approach and the highlighting approach. The holistic approach allowed me to read the data and find the “fundamental meaning or main significance of the text as a whole”(van Manen, p1990, p.93). This approach is subject to the interpretation of the researcher and with it comes the “possibility to err or to see meaning that is idiosyncratic” (van Manen, p.94).

The highlighting approach was used to scrutinize the data and compare the findings to what was found using the holistic approach. When using the highlighting approach, van Manen suggest that the researcher “select some sentences or part-sentences that seem to be thematic of the experience” being studied (van Manen, 1990, p. 94.)

### **Conclusion**

In this chapter, I described the methodology used in this study. The next chapter discusses the findings of the study. I describe the common experiences of Patricia, Felicia, and Cynthia. In the findings chapter I will detail the essential themes I discovered by using van Manen’s highlighting approach.

## CHAPTER IV

### FINDINGS

During the course of this research, three elementary teachers were each observed for one hour as they were teaching with the IWB and were interviewed using a semi-structured interview process. The participants were purposively selected because of their use of the IWB and their self-acknowledgement of how the IWB has changed their teaching and their technological abilities. The three participants had qualities in common I was not aware at the time they were asked to participate. For example, when I chose the participants for the study, I did not realize that all three were National Board Certified teachers or that all three of these teachers have their Masters in Education.

This chapter will report the findings from the research. I will start by describing the interviews and observations that took place with each of the three teacher participants. I will then look at what I feel are the essential themes found in the results.

#### **Participants' Backgrounds**

##### *Felicia*

Felicia has been teaching for 29 years. She taught first grade for the first two years of her teaching career and kindergarten or pre-kindergarten for the next 27 years. Felicia holds a Bachelors of Education in Elementary Education and Early Childhood Education and a Masters in Early Childhood Education. She holds certification in Early Childhood Education and Elementary K – 8<sup>th</sup> Grade Education with several endorsements

for Middle School and Junior High. Despite holding these certifications, Felicia has no interest in teaching anything other than Kindergarten or Pre-Kindergarten. She is a National Board Certified Teacher as Generalist/Early Childhood.

Felicia does not remember receiving any special honors or recognitions during her teaching career. She is a member of the National Education Association and is active in her local affiliation. She also belongs to the National Association for the Education of Young Children being an advocate for young children. For the past five years, Felicia has taught Pre-Kindergarten in a Title I elementary school. Before taking this teaching position, Felicia taught in a small rural school. She has been using the IWB for about seven months.

I observed Felicia and her class on a Friday morning during which time she used the IWB both for large group instruction and as a center for learning. The class was celebrating the anniversary of Dr. Seuss' birth. Felicia read the book *One Fish, Two Fish, Red Fish, Blue Fish* to the class. She used the IWB to model a sorting activity wherein the children were to drag red fish, blue fish, and red-blue fish to a Venn diagram. After modeling the activity for the students, the class went to separate centers with each child getting a turn to use the IWB to sort the fish.

The interview with Felicia took place on a Sunday afternoon, two days after my classroom observation, in the location of her choice, her classroom. Our interview covered many topics and semi-structured. While I went in with likely interview questions in mind, the questions followed the course of the interview. For example, when discussing space in the classroom, Felicia described how she has very purposefully designed her classroom so that it has a flow and no center interferes with another. I

followed this question with an unplanned question whether she had to redesign the layout of her room because of the addition of the IWB. Another example was when Felicia brought up that the IWB has helped her build a community amongst her students, I asked a follow up question about how well behaved her students were when using the IWB. All through the interview, Felicia was very open and effusive in discussing the impact the IWB has had in her daily teaching life.

### *Cynthia*

Cynthia teaches at the same school as Felicia. Cynthia holds Bachelors of Education in Elementary Education and a Masters in Administration. Cynthia is certified in Elementary Education and Elementary Principal. Cynthia is also a National Board Certified teacher with her certification as Generalist/Middle Childhood.

Cynthia serves on many district committees and likes to be involved in her district. Although she belonged to the National Education Association in her previous teaching assignment, she does not currently belong to any professional organizations. Cynthia has been teaching for eight years and is in her second year in her current assignment as a third grade teacher. Cynthia came to her district with two years experience using an IWB and has now been using one for four years. Cynthia is in a unique position as she is one of two IWB trainers in the district and has helped train all of the teachers in the district. This experience gives her a different perspective on using the IWB and its impact in the classroom.

I observed Cynthia and her class the week before Spring Break started and found her using the IWB for a science lesson on rocks and minerals. Cynthia's hour long interview took place in her classroom after school on the day before Spring Break started.

During the course of the interview, I used the same initial interview questions that I used with Felicia. We discussed her experiences using an IWB, what it means to her to have an IWB in the classroom, how it has changed her teaching style. Because the interview was semi-structured, I asked questions pertaining to topics she brought up. When choosing Cynthia as a participant, I had not considered asking questions relating to her previous experiences with IWBs or questions pertaining to her experience as a trainer of other teachers. Cynthia mentioned these experiences and how they created pressure on her to be a resource for other teachers.

*Patricia*

Patricia works in a middle class – upper class elementary school and has been teaching for 14 years. She holds a Bachelors of Education in Elementary Education and a Masters in Curriculum and Instruction with an Early Childhood specialization. As with the other two participants, Patricia is a National Board Certified teacher with her certification being in Generalist/Middle Childhood.

For the past seven years, Patricia has been a member of the National Council of Teachers of English and attends their annual meetings. Patricia is also a member of the local college's branch of the National Writing Project. Until this year, she was an active member of the National Education Association's local affiliation where she previously served as vice president. Patricia has been the recipient of many honors and rewards such as national trainer for National Board for Professional Teaching Standards, teacher of the year at her school in 2000 and in 2007, and member of the Arbor Lake Writing Group and Publishing with Rigby 2000 Reading Series. Cynthia is a grant writer and winner having won grants from the local education foundation twice and one grant from Lowe's.

Patricia has been using her IWB for about seven months. Before attending IWB training, Patricia did not own a computer at home and considered herself a technological novice. During the course of her interview, she related that she had been comfortable using Microsoft Word and using email but these were the limitations of her technological knowledge.

Patricia's interview took place on a Friday morning immediately following my observation, while her students were in physical education. The topics discussed ranged from her developing confidence in her technological skills, how her daily routine has changed since using the IWB, to the relationships she has formed with other IWB teachers. During my observation, Patricia was teaching math while her students were at their desk working on a worksheet matching the problem on the board. Patricia and her students took turns writing on the IWB.

### **Emerging Themes**

In examining the lived experience of these teachers, I have read and reread both the transcripts of interviews and my observation notes in the hopes to discover common themes in the findings. I have attempted to separate incidental themes from essential themes to find out what makes the experience of teaching with an IWB what it is. Van Manen (1990) wrote about finding the essential themes saying, "In determining the universal or essential quality of a theme our concern is to discover aspects or qualities that make a phenomenon what it is and without which the phenomenon could not be what it is" (p. 107). To determine an essential theme, Van Manen said the researcher needed to ask "Is the phenomenon still the same if we change or delete the theme from the phenomenon?"(p. 107).

I have tried to isolate the themes common to all three teachers and those which make the experience of teaching with an IWB what it is. Common words and phrases appeared in interviews with all three teachers. The teachers all mentioned automaticity in using the IWB, with automaticity being the ability to “execute the process without consciously thinking about the parts of the process” (Marzano, 2007, p.61). Having more “teachable moments” was also a recurring phrase mentioned by the participants.

The rest of this chapter covers the themes that I uncovered as a researcher. While other researchers may find there to be other themes within the data, I noted as themes the following: the teachable moment, automaticity, collaboration and community, and flow or lost time.

### **The Theme of the Teachable Moment**

Van Manen (1990) defined the existential lived space, “spatiality”, as “the world or landscape in which human beings move and find themselves at home” (p.102). For teachers, the lived space is the experience created with the flow of teaching. Lived space was examined through the flow of teaching in the space created by the IWB.

Teachers are always looking for ways to easily answer students’ questions in a timely manner, while the topic is fresh and important. The participants in this study say the IWB affords them the opportunities to do so. All three participants mentioned the ability to have more teachable moments as one outcome of their lived experience with the IWB. All three teachers felt that having the technology to research and present information at the request of students, or when the opportunity presents itself has led to a positive effect on the environment in their classroom.



A teachable moment is a time where the teacher ventures away from the planned curriculum and engages in the spontaneity of the moment. The teachable moment can be described as a moment of educational opportunity in which a student is inclined to learn something which is unplanned (Desai & Graves, 2008). This teachable moment becomes part of the enacted curriculum, that which is actually taught.

*Patricia*

Patricia related an anecdote about the ability to “pull up information on the fly” and create teachable moments. Patricia’s class has a subscription to *Time Magazine for Kids*, which they read together as a class. One particular issue featured a mystery person on the back cover with some clues as to who this person was. Through discussion, the class decided that the mystery person was Harriet Tubman “since the clues said she was a famous speaker who spoke out against slavery and had met Abraham Lincoln.” She typed “Harriet Tubman” into the Google search and the picture that came up did not match the picture on the back of the magazine.

Patricia saw this as an opportunity for a teachable moment that “20 years ago wasn’t done.” This was an opportunity to teach using the information on technology literacy she had learned at the National Council for Teachers of English national convention in November 2007. The magazine gave four sentences about the mystery person. Patricia told the students they would have to be “smart about using key words in the clues to put into our Google search.”

The students decided that the key words from the sentences were “African-American woman, slavery, met Abraham Lincoln.” Patricia typed these words into the Google search engine and the first site that came up had the same picture of Sojourner

Truth as the magazine. The students cheered with excitement at having found their mystery person.

When reflecting on this teachable moment, Patricia said she realized that this moment could not have happened last year. In her words, “Last year, I would have gone to my bookshelves and looked for biography books with Sojourner Truth and acted surprised when I said, ‘Look what was next to the biography of Harriet Tubman’.”

Another teachable moment in Patricia’s classroom was when a student announced the class that over Spring Break he was riding the train from Oklahoma City to Galveston, Texas. Being familiar with this train and its route, Patricia knew that he was not riding the train to Galveston but to another town in Texas whose name started with “G.” Using the tools provided to her with the IWB, projector, and computer she went to the Internet and typed “Train ride from OK to TX” into a Google search and the train Heartland Flyer came up. The students were able to see a picture of the train, a map of the route, and pictures taken along the route to Gainesville, Texas.

Patricia feels the students would not have had the chance to learn vital search skills without the ability the IWB and projector provided. She feels having all the tools of a computer readily available and the ability to project her computer screen onto the IWB for the rest of the class to see makes these moments possible. The digital projector was what made this teachable moment important. Before receiving the technology in her classroom, Patricia could have performed both of these teachable moments from her teacher computer on her desk; however, she feels many kids would have been lost as they all came to stand behind her small computer screen and look at the results. Now she can tell her students, “We can look that up” when they ask questions.

## *Cynthia*

Cynthia relayed many teachable moments as well during the course of her interviews, saying that she has resources available at the click of a button on the Internet, negating the need to stop and go to a dictionary or pull a map down during a lesson. Cynthia's class is taking part in the "Flat Stanley Project" which is based on the 1964 children's book and can be found on the Internet at <http://www.flatstanleyproject.com>. Students mail Flat Stanley to people around the world and receive Flat Stanleys from around the world.

Immediately upon receiving Flat Stanley from Peru, the class wanted to discuss Peru. Someone in the class asked, "Where's Peru" and, Cynthia took this as an opportunity to have a teachable moment with her class. Cynthia's school has a subscription to Discovery Education's online curricular content resource called United Streaming. Cynthia turned on her projector and logged into United Streaming where she knew there was an interactive atlas. Pulling up the interactive atlas, she typed Peru into the search box and a map showing Peru came on the screen. Linked to this map of the country were videos about the culture of Peru. As Patricia before her, Cynthia feels this kind of learning activity would not have been possible eight years ago when she started teaching.

The presence of the IWB and projector connected to her teacher computer allows her to "go with what the kids are interested in and not say 'let's go to the library and look that up' or 'Let's get an atlas out'." She can now teach in a more constructivist style following the students' lead in their quest for knowledge

*Felicia*

For Felicia, the IWB presents teachable moments as well. She states that, “you can plan down to the ‘nth’ degree” but when working with four year olds the planned curriculum is never going to be exactly what she thinks it is going to be. She describes her students as “little sponges” having their own ideas about what they want to learn and “sometimes you just let them go with it.” Like Cynthia and Patricia, Felicia feels that with IWB technology she does not have to stop a lesson to go to books or to the library to find information. Felicia reports that instead of saying, “All right...wait...how do we figure this out?” she can now say, “let’s look this up.”

Felicia thinks the IWB creates more teachable moments that may happen any time during the day. The IWB allows her quickly and easily to modify her planned curriculum at any time. She expressed that if a student asks a question and she wants to provide more information, if she feels she needs to reinforce a concept, or provide information about a topic that sparks her students’ interest, the IWB is a “flexible tool that lets me use my own resources, resources from Notebook software, or use the many resources available online” such as maps, pictures, video, sounds, music, charts.”

One example is the time a boy brought a giant stuffed orca to class that he got at Sea World. When an opportunity such as this occurs, she asks the students, “What are the places where I can go to learn more about it?” After suggesting looking in books, Felicia’s students then said that she could go to the computer to look something up. In the case of the orca whale, she told the students where she was going on the Internet, what to type, and what comes up. The students could see the process step-by-step and

within two or three minutes of the beginning of the conversation, Felicia was showing them a video from United Streaming on orca whales.

Another teachable moment happened when she was reading *And The Dish Ran Away With The Spoon* during a unit about nursery rhymes. In the story, the Cat, Cow, and Dog set out to rescue their friends, Dish and Spoon, in time for the next evening's reading of their rhyme. On the way, they meet a fork that saw Dish and Spoon and who draws the three friends a map showing all the places they need to look.

Felicia says that she teaches a unit on maps towards the end of the school year but because this year the children asked questions about the compass and noticed things about the fork's map, she modified her plans. She used her document camera to take a picture of this map and put it into the SMART Notebook software. Using the IWB, the children were able to see the different things on the map, and she could draw attention to specific map skills. Felicia added clip art of the dish, spoon, cat and fiddle, cow, and moon to the map and had the children move them around the map as she reread the story. Using the software's ability to draw lines, the children marked the path the characters took on the map. The children were able to learn map skills and extend their learning in a kinesthetic way

Answering in much the same way as the two other participants, Felicia said, "I could not have done this before. We would have talked about it or I would have pulled it up on the little screen, but they wouldn't have been able to see it." She feels she is now able to scaffold their learning better by using technology. Felicia's philosophy concerning technology is to use it to get information and enhance the learning experience.

Using technology in this manner is in keeping with her constructivist philosophy of teaching.

### *Summary*

The teachable moment formed with the IWB created an atmosphere where the students were given the opportunity to explore the world from the safety of the classroom, the lived space (van Manen, 1990). The lived space created with the IWB made the classroom a safe haven where the teachable moment could occur. For the three participants in the study, the IWB has allowed the teachable moments to occur. Each feels that having so many resources available at the touch of a button has allowed her to present more information to her students that she would have been able to do in the past.

### **The Theme of Automaticity**

This study looked at the existential of corporeality or lived body. Van Manen (1990) defined this as the fact that we are always bodily in the world. Lived body was examined through automaticity and the connection between the mind and body.

The theme of automaticity is related to this existential. In his book *The Art and Science of Teaching*, Marzano (2007) wrote of automaticity saying it develops from procedural knowledge, which is “knowledge oriented toward skills, strategies, or processes” (p. 60). When the skill or process can be performed “without consciously thinking about the parts of the process,” automaticity has developed (Marzano, p. 61). Automaticity can be likened to driving a car. When learning to drive, people have to consciously think about their bodies when moving their arms and putting the car in Drive, moving their eyes to check the rearview mirror every few seconds, putting their feet on

either the gas pedal or the breaks. Over time, these driving skills become automatically performed.

During their interviews, each of the participants relayed how using they have developed automaticity when using the IWB. While performing classroom observations, I noticed the teachers automatically using tools in the SMART Notebook program.

*Patricia*

Patricia remembered “going slowly at the beginning of the year” because she was trying to remember which buttons to push on the toolbar in the software to get a highlighter or assign a different color to a pen. She now feels there are tasks she can perform without thinking such as adding a new page to her document and using the tools on the toolbar. She feels comfortable using the screen capture tool in the software to take a “picture” of something she finds online and wishes to share with her students.

Patricia thinks that as she became more comfortable using the SMART Board and SMART Notebook software, automaticity developed, saying that “automaticity...is where you figure out...you are not going to have to think through three steps in order to get to what you want kids to do.” Patricia developed efficiency and speed as she gained automaticity. When presenting material or creating lessons, several options run through her brain. An example would be asking herself if it is faster and more efficient to draw something on the board, to freeze the projector screen, to screen capture material found on the Internet, or to find clip art or pictures in the software’s gallery, and making an instant decision on the fly.

I asked Patricia a question based on the above description of the automaticity involved in driving a car, asking her to compare her skills with the IWB to her memory of

learning to drive at 16 when all her decisions were consciously thought about. She reported she was now a 17-½ year old driver, where some of the things she does are automatic and some still require conscious thought. In observing Patricia, I noticed the ease with which she teaches using her IWB and feel that she underestimates her ability.

The SMART Board software drivers install something called a floating toolbar. This toolbar is located on either the right or left of the display screen and among its many tools it contains are tools for highlighting, screen capturing, drawing, and magnifying objects. Of the three teachers I observed, Patricia is the only person I have seen use this toolbar. Most users find its presence on the screen a nuisance and check the option to hide it. On the other hand, I observed Patricia uses the toolbar to get a highlighter and change the color of the highlighter to emphasize information. I observed her perform this task fluidly, not stopping to think.

Patricia's use of the IWB and software seems effortless and automatic. In observing her, I watched as she pushed different buttons on the toolbar, switched pen colors, and "extended" the page when there was not enough room to continue writing. When Patricia wanted to show her students information on two separate pages, she used the dual page display button without having to stop to think about where it was. These are all skills that I have seen other teachers struggle with.

### *Cynthia*

Cynthia described two types of automaticity: the kind that occurs when you are creating lessons at your computer and the kind that occurs when you are standing in front of others. Cynthia has been using an IWB for four years. For her, automaticity developed from her four years of experience leading to her belief that she is quicker now



when using the board. To Cynthia, automaticity came from being prepared and having everything ready for her lessons. When she is prepared, she “feels less flustered” leading to smoother transitions and proficient use when standing in front of the class.

When asked if using the toolbar and switching between pages when teaching is automatic, Cynthia described how using the IWB and software has become routine. When something goes wrong, she has to stop and really think about what happened. She reported, “I’m so used to doing it the way I do it that I use it without thinking about it.”

As a trainer, Cynthia has taught other teachers using the IWB. When teaching trainees, she explains that the process of using the IWB was not as automatic and was tinged with a certain amount of fear. She has to concentrate on what she is doing to avoid making mistakes in front of the trainees.

Most teachers create the lessons they will present on the IWB while working on their desktop computer. For Cynthia, creating lessons while using her desktop computer has become automatic. Without the pressures of a crowd or a group of peers, she is more relaxed and she instinctively uses the SMART Notebook software to create lessons.

As with Patricia, when observing Cynthia I noticed that she undervalues her skills. Cynthia has a document camera in her room that is attached to her digital projector. During the lesson I observed, Cynthia easily switched between video sources from projecting the lesson on the IWB to projecting material placed on the document camera.

Cynthia’s class was disruptive on the day I observed causing her to stop her lesson many times to wait for them to settle. During one of those times, she told the class “Let’s take five minutes.” She went to her SMART Notebook software and searched the

interactive object gallery for a countdown timer. Placing it on the displayed page, she set it at five minutes and clicked start. The class had to sit still without talking for that entire five minutes. I found this to be evidence to me that she is very familiar and comfortable with her SMART Board and the SMART Notebook software.

### *Felicia*

It was from Felicia that I first heard of the word “automaticity.” In the course of her interview, Felicia repeatedly mentioned the automaticity that has developed in using her IWB, its software, and presenting material to her class. Talking about what it means to her to have an IWB in her classroom, Felicia said, “It opens up a lot of possibilities and it makes teaching easier in a lot of ways...it creates that automaticity, that educational flow.”

Felicia said she does not have to stop and think now when working with her IWB. Using the IWB has become so automatic for Felicia, that when other teachers watch her at her IWB and ask, “How did you do that?” she has to stop and ask herself “Now what did I do?” The skills and processes involved in using the IWB have become like typing on a typewriter for her, something she does without thinking.

Felicia said that there is a price to pay for automaticity in using the IWB to develop. The price is spending hours and hours using the software and becoming familiar with it. If a teacher learns the software, which can only be done by using it daily, then they get to know the software well enough that they do not have to stop and think about each thing they want to do. Felicia believes that taking the time in the beginning will lead to less time later on as the skills become automatic.

Felicia is confident in her skills and knowledge. Observing her class, I noticed the confidence in her teaching. She has many files open on her computer and fluidly moves between her open files by touching the Windows taskbar displayed on her IWB. When Felicia's class started to get restless, she knew she had a song hyperlinked on one of her open files and smoothly found the file, clicked on the song, and the class sang the song. I watched as Felicia helped students who were having problems using the board during the *Red Fish, Blue Fish* lesson. One student could not move the fish and Felicia came to the board and showed the student how to drag the fish using his knuckle instead of his fingertip. Another student was starting to get upset because the digital ink was not writing for him. Felicia calmly came over and investigated, fixing the problem by placing the pen back in the pen tray and picking it up again.

### *Summary*

Each of the participants demonstrated the automaticity of the lived body created when using the IWB. This automaticity was developed through practice and long hours of work. The teachers all realize that it was the “doing” of building lessons and teaching those lessons that created their newfound skills; skills created when the body performs a task enough for the brain to make the task automatic. Automaticity becomes part of the existential of the lived body through the connection made between the mind and body.

## **The Theme of Collaboration and Community**

The existential relationality or lived other “is the lived relation we maintain with others in the interpersonal space that we share with them” (van Manen, 1990, p.104). This lived relation was explored through the theme of community and collaboration.

When the participants received their IWBs at the beginning of the school year, they agreed to come to a monthly “user’s group” meeting of teachers with IWBs in the school district. During these meetings, the users share strategies, try to solve common problems, and collaborate on creating lessons. Over the past seven months, a community has developed among the IWB users. This community is composed of teachers from pre-kindergarten through fifth grade from five of the six elementary schools. Teachers who did not know each other in the beginning have developed relationships they would not otherwise have formed. This theme of collaboration, growth, and community was a common theme among the three research participants.

### *Patricia*

Along with Patricia, there were two other IWB teachers in her building at the beginning of the year. All three of these teachers were novices. Patricia reported that as they first started using the IWB, they relied on each other for “small details...and at the beginning would run into each others’ rooms saying ‘I can’t figure out how to turn it (IWB) on. Or it’s not letting me move the table I created. Help!’” After seven months of use, they now run into each other’s rooms to ask to see a clever new lesson they have created or to show a new skill they developed.

Patricia loves attending the monthly meetings and feels that these meeting are some of the best professional development meetings she has attended in her teaching

career. Learning a skill that she can use the next day has much appeal to her. Patricia feels that being able to collaborate citywide and to share ideas and lessons with other teachers across the district at the grade level improves her students learning and her teaching daily.

*Cynthia*

For Cynthia, the collaboration starts within her grade level at her building. The four third grade teachers she works with all take one subject and create IWB lessons on that topic, building the directions and instructions from the teacher's manual into the file. Cynthia feels that she has formed closer bonds with her grade level team this year than she did last year because of the collaboration when using the IWB.

Cynthia's building received eight IWBs at the beginning of the school year. One of the questions I asked her was whether she has formed relationships with teachers in her building this year that she did not form last year. She told me that she had never talked to the pre-kindergarten or kindergarten teachers before they all received IWBs. Because of the user group meetings, they talk more than they ever did before. While some teachers may feel that they cannot learn any skills from teachers beyond their grade level, especially from early childhood teachers, Cynthia does not feel this is true saying, "I might not be doing the same subject matter but the way they (pre-kindergarten and kindergarten teachers) present materials and the ideas they bring to the meetings I can definitely use."

As a new teacher in the district, Cynthia has found the IWB to be an avenue for developing relationships within the district. In the course of the interview, Cynthia said that she now feels she could call or email most of the IWB users to ask questions or share

new ideas. This collaboration has crossed into her personal life as she now can go to church or the store and talk with other IWB teachers.

### *Felicia*

As with Cynthia, collaboration starts for Felicia in her building. A kindergarten teacher a few doors down also has an IWB and she and Felicia frequently collaborate, building files and lessons together. During *Read Across America* week celebrating the anniversary of Dr. Seuss's birth, Felicia and the kindergarten teacher developed a rather large lesson for use on the IWB. Over the course of the interview, Felicia said, "We work together a lot and we work separately. We'll just kind of mesh and it really works well."

Felicia said she learns more from watching her colleagues work than she could ever figure out on her own. For her, collaboration helps her build her own skills using the IWB. Because of her confidence in working with the IWB, teachers come to Felicia for help or ideas. Helping others with problems is another way Felicia develops her skills; she learns by teaching.

The user group meetings have helped Felicia get to know teachers from across the district and from within her school. Because of these meetings, Felicia reported learning from others and expressed her hope that others learned from her. Felicia stated that having an IWB "has built some relationships that probably wouldn't have happened. I like collaborating with other people."

### *Summary*

The experience of relationality or lived other created the collaboration and community that was an important part of the experience of teaching with an IWB. For

each of these teachers, collaboration while using an IWB has created a community that they can rely on for support. All three teachers expressed that sharing ideas and discussion during user group meetings have helped them to increase their technological knowledge and skills using the IWB. It is my feeling that these three teachers, and the other like them, would not have been as successful at using their IWB without the community that was built.

### **The Theme of Lived Time**

This study looked at lived time (temporality), which is not clock time. Van Manen (1990) defined lived time as “the time that appears to speed up when we enjoy ourselves, or slow down when we feel bored” (p.104). Lived time was looked at both in terms of preparing lessons and in teaching.

For the teachers who use an IWB in their classroom, lesson preparation takes more time at first because lessons created using the SMART Notebook software take time to create. Each of the teachers in this study was willing to spend the time needed to create well planned, and well developed lessons for their classrooms. Not having enough time is a common complaint among teachers. The teachers in this study talked about lived time in terms of losing track of time; time that sped up when teaching with the IWB.

#### *Patricia*

In the interview with Patricia, I asked her if her perception of time has changed since she has begun using her IWB. Patricia told me that for her time flies because people do not tend to notice time when they are doing something enjoyable. She reported that there have been many times this year when she and the class have been so involved

in their work that they have been late for a specials class, lunch, or recess. Patricia and her class get involved in manipulating objects on the IWB or having deeper conversations than in previous years.

Since receiving an IWB, Patricia has purchased a laptop computer to use at home in creating her lessons. Creating lessons at home has become a “time eater” where she will say to herself “oh my goodness I have worked on this for two hours.” While she does want to create the best lessons she can, Patricia is worried about spending too much time working. She has been concerned all year that creating lessons for the IWB could turn into an obsession and works hard to make herself cognizant of the passage of real time.

### *Cynthia*

As with Patricia and many other teachers, Cynthia creates lessons at home. Cynthia said that when creating lessons for the IWB at home, time goes by quickly, sometimes spending as much as one hour searching the Internet for clip art to add to her lessons. She reported that there were times when she found herself “fidgeting with something” as many as six times and then not liking what she had created and starting over again. Creating and planning lessons was simpler for Cynthia in the years she did not have an IWB when she could quickly create an example for class on chart paper. Now she spends more time creating and preparing for lessons because the IWB affords her the chance to put more details and instructions into a lesson.

When asked about whether teaching time goes fast and if she extends past her planned schedule, Cynthia reported that it happens often. The class will get into more conversations than in the years when she taught without the IWB. She also said that she



was part of the reason she goes over schedule. Wanting to make sure all students understand the concept being studied, she said that she frequently explains a concept for twenty minutes, adding new page after new page to her presentation to present different strategies.

### *Felicia*

Time flies in Felicia's class as well. When teaching her class, Felicia said she had several "oh my goodness" moments realizing suddenly she has spent more time than planned. Using the IWB while teaching, Felicia has lost time on many occasions. She said that her class is late to breakfast often because she and her class are so engaged in their work.

When working at home creating lessons, three hours pass without Felicia realizing it. She said that when creating lessons she will "get in a groove" because she is having fun and being creative. At home she gets into a zone and will look up and realize that it is 8:00PM and she has not fixed dinner, and yet she tells herself that "I will finish this one little project" and look up and another hour has passed. Felicia said she sometimes makes herself turn off the computer or she might never stop working.

### *Summary*

The experience of lived time, time she feels like it is moving faster when performing enjoyable tasks, was central to the experience of all three teachers (van Manen, 1990). They lost track of time while creating lessons or while teaching, which seems to be a common problem among the participants in this study. They are so focused on what they are creating that they can miss supper or stay up too late at night working. The three teachers in this study all are perfectionists for whom their lesson is never right.

They are constantly remaking and redoing the lessons they create. Often times, the teachers are late for other scheduled activities because of the lived time experience. In the classroom, the lived time experience of time moving faster happens because of the intense focus and in-depth discussions that occur with the IWB and software.

### **Conclusion**

After discovering the essential themes presented in this chapter, I ask myself, “What does it mean? What are the implications of what I have discovered?” The following chapter will discuss my reflections and what I think are the implications based upon the findings reported in this chapter.

## CHAPTER V

### REFLECTIONS AND IMPLICATIONS

Having interviewed the participants and done classroom observations, I wonder if I have conveyed the lived experience of the participants. Have I portrayed what the experience of teaching with an IWB is? What conclusions can be made from the essential themes found in the “Findings” chapter? In this chapter, I hope to offer some thoughts and conclusions on each essential theme.

This final chapter begins by restating the research problem and the methods employed in conducting this study. The major portion of this chapter consists of reflections about the results, recommendations for educators, and suggestions for future research.

#### **Research Problem**

This study attempted to examine the lived experience of primary classroom teachers using Interactive Whiteboards in their classrooms. When discussing the idea of a research study, van Manen (1990) wrote, “Lived Experience is to the soul what breath is to the body.... the breathing of meaning” (p.36). The purpose of this research study was to breathe meaning into how teaching with an Interactive Whiteboard can change a teachers’ teaching style.

The research questions that formed the basis of this study are:

1. What is the experience of having an Interactive Whiteboard in a primary classroom like for teachers?
2. How has having an Interactive Whiteboard shaped teaching and learning in the teachers' classroom?
3. What role does having advanced technology in the classroom play in a teacher's technological development?

### **Review of Methodology**

For this research study, observations and interviews were conducted using the four-life world existentials of spatiality, corporeality, temporality, and relationality or communality as a guide (van Manen, 1990). Van Manen (1990) described thematic analysis as the highlighting approach was used to unsnarl and begin to analyze the data. Reading and rereading transcripts of the interviews and studying notes taken during observation, essential themes emerged. While I had planned to use a blind technological survey on presenting my results, I found the survey not to contribute meaningful data to the study. The survey did show that teaching with an IWB did led to an increase in the teachers' technological skills; however, I felt that relationality created through community and collaboration better represented this increase in technological skills. Also, the survey was given to seven teachers, which would have changed the manner in which the findings chapter was organized and made it difficult to report out the results.

## Variations on Themes

### *Teachable Moments*

As I listened to each teacher tell her story about teachable moments in her classroom and as I observed for myself teachable moments in the classroom, I wondered whether the IWB enabled the teacher to have these moments. Was there some property inherent in the IWB and its accompanying software that created teachable moments? Or was it possible that other factors contributed to these teachable moments?

In most of the examples above, the teachers described moments where their students wanted more information than they had planned to present. Each relayed how they used the Internet as a resource. In one case, Google was the search engine employed in teaching research skills. Two anecdotes described using Discovery Education's United Streaming to find information. Only one participant told of using the SMART Notebook program that came with the SMART Board in their teachable moment.

There is little doubt that technology contributed towards teachers pursuing teachable moments. While it is possible that using the IWB factored into creating teachable moments in the classroom, an alternative theory could be that three of the described teachable moments could have taken place using only a digital projector connected to a computer and a live Internet connection. I have to wonder whether the participants of this study fully realize the affordances of the IWB technology. The IWB software gives teachers the ability to reuse and review lessons, which in turn could help create teachable moments. This software also gives teachers easily manipulated resources that a whole class can see instantly. The opportunity to create teachable

moments lies in the software, the IWB, and the educators' understanding of the potential of both.

### *Automaticity*

Marzano (2007) defined automaticity as procedural knowledge that creates skills or strategies, which are performed without conscious thought. All of the participants reported that with increased use of the IWB and associated software, automaticity developed. I observed all three participants teaching with the IWB, using lessons created with the accompanying software. All three looked to be comfortable teaching with the technology. Each was at ease in their classrooms and remained unflustered when the technology did not respond as expected.

Reflecting on the interviews and observations, what comes to mind is that all skills, not just those related to technology, develop with continued use and practice. Teachers wishing to teach with an IWB need to realize the amount of time and dedication needed to realize all the potential and affordances of the technology. Only with many hours of use and practice with the software and the IWB does automaticity develop.

### *Collaboration and Community*

The participants in this study are part of a group of teachers who meet once a month to share strategies and techniques for creating lessons to use on the IWB, to solve common problems encountered in using the IWB, and to discuss how they use the IWB in their classroom. During the course of seven months, a community of users developed. The teachers involved in this study all reported on how community and collaboration contributed to the growth of their skills when teaching with the IWB. Self-efficacy

developed through collaboration because through community each teacher encouraged the others to increase their skills.

The participants in the study felt that collaboration helped them to develop relationality, or a sense of community. Reviewing what the teachers reported, it appears that one key to successful use of the IWB is community. For the teachers in this study, the development of community created a support system. Using this support system, the teachers increased their skills with the IWB and accompanying software. Within this support system, the feeling of being as proficient as other users helped to create successful integration of the IWB into their daily lives. I question whether an informal support system would develop even if the regularly scheduled meetings ended. I think that the support system would possibly develop among teachers of the same grade level but not necessarily among all teachers teaching with the IWB.

### *Lived Time*

Participants in the research reported on having moments of lost time or the existential experience that van Manen (1990) refers to as “temporality” (p.104). The experience of lived time was examined in interviews through lesson planning and teaching. All the teachers stated that they lost track of time when preparing lessons. One of the reasons this time was lost during lesson planning was because the activity was enjoyable. Another reason the participants lost track of time when planning lessons was due to their desire to create the perfect lesson, searching for clip art or other resources.

The teachers also reported that they lost time when teaching with the IWB, giving examples of times when they were late to a special class, lunch, recess, or some other activity. This time appears to have been lost because of the interaction between students

and teachers. In the interviews, the two third grade teachers relayed that conversations with students are more in depth than in previous years, which they attribute to the IWB. All three teachers felt that students were more engaged when using the IWB. The interaction, conversations, and engagement led to losing track of time in the classroom.

### **Implications**

Teachable moments, automaticity, losing track of time, and community seem to have developed when the teachers were knowledgeable about the IWB and its software. Extensive training combined with ongoing professional development gave the teachers the skills and tools necessary to fully utilize the affordances brought from using the IWB. Teachable moments were pursued when teachers knew the IWB and software well enough to instantly extend a lesson as called for. Without this knowledge, it is probable these moments would not have occurred, at least not as effortlessly and efficiently as when using the IWB. Because of extensive ongoing professional development and training, the teachers developed the automaticity that allowed them to utilize the IWB while teaching without having pauses or gaps in instruction as they stopped to figure something out. Lost time occurred because of the combination of training and automaticity. Losing time when creating lessons occurred once the teachers had the knowledge needed to both create engaging lessons and enjoy creating them. Community and collaboration were created through the ongoing training that occurred. This led to the teachers sharing skills and ideas with each other.

The results of this small study seem to indicate that for teachers to become successful users of technology, integrating it into every subject, they need thorough hands-on training and ongoing professional development. To use the IWB as something



more than a projection screen, teachers need training on its capabilities for enhancing teaching and learning. When not given training, professional development, and time for collaboration, the IWB becomes merely a projector screen, hanging on the wall unused. Too often, money is spent on hardware and software but not on training, leading to frustration, little-used equipment, and wasted money. Teachers also need time to collaborate with each other. The teachers in this study increased their skills partly through the support system created by collaborating with other users, formally and informally. Knowledge lays in the teacher not in the IWB itself, the IWB software, the Internet, nor the computer. Having an IWB in the classroom does not automatically make a teacher a better teacher; it is merely a tool to be used in teaching. Skills lay within the teacher not the technology. Technology is part of today's culture that teachers need to adopt and use. Teachers with IWBs in their classroom need to understand the time and learning involved in teaching with it.

Administrators and policy makers need to understand that spending money on hardware or software without training is wasting money. They need to provide opportunities for teachers to collaborate, whether through meetings before or after school, or through observing each other. On-going professional development should be provided for teachers using an IWB, not the one time professional development that still happens frequently. Administrators and policy makers should attend trainings on hardware or software, in this case the IWB, so that they are fully cognizant of the potential that lies within the tool. Finally, administrators and other decision makers need to understand that certain technological tools are not mandatory for quality instruction. For example, not every teacher needs an IWB in his or her classroom. For some teachers, a digital

projector attached to a computer connected to the Internet will create some of the same teachable moments described in chapter four.

### **Recommendations for Future Research**

As I was writing the findings chapter and this chapter, I thought about future research possibilities. This research looked at the lived experience of teachers using IWBs in the classroom. I have come to wonder which is more important: the IWB or its software? Can one be used without the other? In the interviews, the teachers told several anecdotes about using the IWB, but upon reflection, I see that for the most part they were talking about what the software could do. The software gave the teachers the ability to create lessons with animation, lessons where students could manipulate objects on the IWB. The software made it possible for teachers to present material in a different manner. For this study, the presentation software used was SMART Notebook. Future studies might want to look at the difference between using the software to create lessons and using the IWB as a large mouse, a projection of a teacher's computer screen.

Another possibility for further study is the relationship between time on task and interactive lessons. I have read many studies claiming the IWB created student motivation and helped keep students on task. In some ways, I think this is true. However, while observing I saw teachers using the IWB and students who were not motivated and were not on task. One factor that could play into this is students not being able to see the board from their desk or table. I have watched children in third grade lose interest in the lesson presented. This occurred in lessons where there was less interaction between the students and the IWB, where the teacher was the primary user of

the IWB. Could interactivity increase time on task and student engagement? This is something to be pondered in future studies.

An additional question for future research could be looking at teachers who request the IWB versus those teachers for whom it is forced upon. How does usage differ between these groups of teachers? In this study, the teachers requested the IWB by completing an application stating how they would use it and why they needed it in the classroom. Are teachers more or less likely to use a tool that is forced upon them?

During the course of this study, I discovered that all three teachers held Masters in Education and were National Board certified. One wonders whether having these qualities leads them to seek innovative teaching methods and tools. Are these teachers constantly seeking avenues for professional growth? Is this true autonomy?

### **Final Musings**

Reflecting on the interviews, observations, and journal articles I processed during the course of this study, I see many positive benefits to having an IWB in the classroom such as being able to instantly follow through on teachable moments and being able to create and teach more interactive lessons where students can manipulate resources on the IWB. The danger with IWBs and any technology lies in making the learning serve the technology rather than using the technology to enhance the learning. The IWB is just a tool to use in teaching much as the chalkboard was a new tool to use over 200 years ago when it was first introduced. Knowledge lies within the teacher and results come through practice and collaboration. In my job, I have heard of parents who want to place their children in classrooms that have an IWB, as if the IWB is the only deciding factor in how

well their child learns. As teachers, parents, or administrators, we need to remain mindful to keep the focus on the children not on the tools and new technology.

What makes the three teachers in this study use the IWB to its potential? What drives them to work long hours creating lessons? These teachers do what they do for the children. In the end, teachers need time and training invested in them for them to do their job well. The technology is exciting and promising but cannot replace a well-prepared and well-trained educator who cares about his or her students.

## REFERENCES

- Albion, P. A., & Ertmer, P. A. (2002, September/October). Beyond foundations: The role of vision and belief in teachers' preparation for integration of technology. *TechTrends*, 46(5), 34-38.
- Armstrong, V., Barnes, S., Sutherland, R., Curran, S., Mills, S., & Thompson, I. (2005, November). Collaborative research methodology for investigating teaching and learning: the use of interactive whiteboard technology. *Educational Review*, 57(4), 457-469. Retrieved January 10, 2009, doi:10.1080/00131910500279551
- Beeland W.D. (2002) Student engagement, visual learning and technology: Can interactive whiteboards help? Available at: <http://plato75.ncl.ac.uk/beeland.pdf>. Last accessed February 21, 2009.
- Beauchamp, B. (2004). Teacher use of interactive whiteboard in primary schools: towards an effective transition framework. *Technology, Pedagogy, and Education*, 13(3), 327 – 348.
- British Educational Communications and Technology Agency (Becta) (2004). *Getting the most from your interactive whiteboard: A guide for secondary schools*. From <http://foi.becta.org.uk/display.cfm?cfid=1476190&cftoken=29154&resID=35754>

- Cuthell, J. (2005). The Impact of interactive whiteboards on teaching, learning and attainment. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2005* (pp. 1353-1355). Chesapeake, VA: AACE. Retrieved February 12, 2008, from [www.virtuallearning.org.uk/changemanage/iwb/Impact%20of%20IWB.pdf](http://www.virtuallearning.org.uk/changemanage/iwb/Impact%20of%20IWB.pdf)
- Desai, C., & Graves, S. (2008, Spring2008). Cyberspace or face-to-face: The teachable moment and changing reference mediums. *Reference & User Services Quarterly*, 47(3), 242-255. Retrieved April 4, 2009, from Professional Development Collection database.
- Ergo in Demand. (2009). Chalkboard education goes back to 1801 long before whiteboards & corkboards were in existence. In *About blackboards - blackboard technology and chalkboard history advances*. Retrieved March 1, 2009, from [http://www.ergoindemand.com/about\\_chalkboards.htm](http://www.ergoindemand.com/about_chalkboards.htm)
- Erlanson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry*. Newbury Park, California: Sage.
- Glover, D. & Miller, D.J. (2001) Running with technology: the pedagogic impact of the large-scale introduction of interactive whiteboards in one secondary school *Journal of Information Technology for Teacher Education*,10(3) 257- 276
- Glover, D., Miller, D., Averis, D., & Door, V. (2007). The evolution of an effective pedagogy for teachers using the interactive whiteboard in mathematics and modern languages: an empirical analysis from the secondary sector. *Learning, Media and Technology*,3 (1), 5-20. Retrieved February 25, 2009, from

<http://www.informaworld.com.argo.library.okstate.edu/10.1080/17439880601141146>

- Green, J. D. (2005). The impact of teacher self efficacy and attitudes toward classroom computers(s) on the use of classroom technology. Dissertation Abstracts, AAT 3218278. (UMI No. 3218278) Retrieved January 19, 2008, from Dissertations \$ Thesis: A&I Database
- Hall, I., & Higgins, S. (2005). Primary school students' perceptions of interactive whiteboards. *Journal of Computer Assisted Learning* 21(2), 102 – 117. Retrieved February 13, 2009, doi:10.1111/j.1365-2729.2005.00118.x
- Higgins, S., Beauchamp, G., & Miller, D. (2007, September). Reviewing the literature on interactive whiteboards. *Learning, Media, & Technology*, 32(3), 213-225. Retrieved January 10, 2009, doi:10.1080/17439880701511040
- John, P. (2005). The sacred and the profane: Subject sub-culture, pedagogical practice and teachers' perceptions of the classroom uses of ICT. *Educational Review* 57(4). 471 – 490.
- John, P., & Sutherland, R. (2005). Affordance, opportunity and the pedagogical implications of ICT. *Educational Review* 57(4), 405 – 415.
- Kennewell, S. (n.d.) Reflections on the interactive whiteboard phenomenon: A synthesis of research from the UK. From <http://www.aare.edu.au/06pap/ken06138.pdf>
- Kennewell, S., & Higgins, S. (2007, September). Introduction. *Learning, Media & Technology*, 32(3), 207-212. Retrieved February 21, 2009, doi:10.1080/17439880701511024

- Kennewell, S., & Morgan, A. (2003) Student teachers' experiences and attitudes Towards using interactive whiteboards in the teaching and learning of young children, in *Proceedings of Young Children and Learning Technologies Conference*. Retrieved on February 24, 2009, from <http://crpit.com/confpapers/CRPITV34Kennewell1.pdf>
- Kennewell, S., & Morgan, A. (2006, April). Factors influencing learning through play in ICT settings. *Computers & Education*, 46(3), 265-279. Retrieved February 24, 2009, doi:10.1016/j.compedu.2005.11.001
- Marzano, R. J. (2007). The art and science of teaching: A comprehensive framework for effective instruction. Alexandria, VA: Association for Supervision and Curriculum Development. Retrieved on March 29, 2009, from [http://www.ascd.org/publications/books/107001/chapters/What\\_will\\_I\\_do\\_to\\_help\\_students\\_practice\\_and\\_deepen\\_their\\_understanding\\_of\\_new\\_knowledge%2%A2.aspx](http://www.ascd.org/publications/books/107001/chapters/What_will_I_do_to_help_students_practice_and_deepen_their_understanding_of_new_knowledge%2%A2.aspx)
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Josey-Bass.
- Mahon, E. (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
- O'Sullivan, S. (10/19/2008). Box clever or board stupid?. *The Sunday Times*, Retrieved January 12, 2009, from Newspaper Source database.
- Prensky, M (2001). Digital natives, digital immigrants. *On Horizon* (9)5, p 1 – 6.



- Preston, C., & Mowbray, L. (2008). Use of smart boards for teaching, learning and assessment in kindergarten science. *Teaching Science (54)*, 50 – 53.
- Slay, H., Sieborger, I., & Hodgkinson-Williams, C. (2008, November 1). Interactive whiteboards: real beauty or just "lipstick"?. *Computers & Education*, 51(3), 1321-1341. Retrieved February 23, 2009, doi:10.1016/j.compedu.2007.12.006
- SMART Technologies ULC. (2009). *SMART Board™ interactive whiteboards*. Retrieved November 9, 2007, from <http://www2.smarttech.com/st/en-US/Products/SMART+Boards/default.htm>
- 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.
- Smith, H., Higgins, S., Wall, K., & Miller, J. (2005, April). Interactive whiteboards: Boon or bandwagon? A critical review of the literature. *Journal of Computer Assisted Learning*, 21(2), 91-101. Retrieved January 10, 2009, doi:10.1111/j.1365-2729.2005.00117.x
- Schmid, E. (2006, February). Investigating the use of interactive whiteboard technology in the English language classroom through the lens of a critical theory of technology. *Computer Assisted Language Learning*, 19(1), 47-62. Retrieved January 10, 2009, doi:10.1080/09588220600804012

- Springer, S. (2004) Effects of multimedia staff development presentations on faculty's conceptual understanding and computer anxiety. Ph.D. dissertation, The University of Nebraska - Lincoln, United States -- Nebraska. Dissertation Abstracts, AAT 3150694. (UMI No. 3150694) Retrieved January 19, 2008, from Dissertations & Thesis: A&I Database
- Starkman, N. (2006, May). The wonders of interactive whiteboards. *THE Journal*, 33(10), 36-38. Retrieved January 10, 2009, from Academic Search Elite database.
- Sutherland, R., Armstrong, V., Barnes, S., Brawn, R., Breeze, N., Gall, M., et al. (2004, December). Transforming teaching and learning: Embedding ICT into everyday classroom practices. *Journal of Computer Assisted Learning*, 20(6), 413-425. Retrieved January 10, 2009, doi:10.1111/j.1365-2729.2004.00104.x
- Wall, K., Higgins, S., & Smith, H. (2005, September). '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. Retrieved January 10, 2009, 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
- Willis, G. (1991). Phenomenological inquiry: Life-world perceptions. In E. C. Short (Ed.), *Forms of curriculum inquiry* (pp. 173 - 209). Albany, New York: State University of New York Press.

## APPENDICES

## Appendix A – Instructional Review Board Human Subjects Research Approval

### Oklahoma State University Institutional Review Board

Date: Tuesday, February 17, 2009  
IRB Application No: ED0922  
Proposal Title: Teachers' Lived Experience with Interactive Whiteboards in the Primary Classroom

Reviewed and Processed as: Exempt

**Status Recommended by Reviewer(s): Approved Protocol Expires: 2/16/2010**

Principal Investigator(s):

|   |   |
|---|---|
| Shawn Gregory<br>209 South Hartford<br>Stillwater, OK 74074 | Pamela Brown<br>237 Willard<br>Stillwater, OK 74078 |
|---|---|

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Skelia Kennison, Chair  
Institutional Review Board

VITA

Shawn Kevin Gregory

Candidate for the Degree of

Master of Science

Thesis: LIVED EXPERIENCE OF PRIMARY TEACHERS USING INTERACTIVE WHITEBOARDS IN THEIR CLASSROOM

Major Field: Curriculum and Leadership Studies

Biographical:

Personal Data: Born in Okeene, Oklahoma on December 12, 1966.

Education: Graduated from Enid High School, Enid Oklahoma in May, 1985; received a Bachelor of Music Degree in Vocal Music Education in May, 1993. Completed the requirements for the Master of Science or Arts in Curriculum and Leadership Studies at Oklahoma State University, Stillwater, Oklahoma in May 2009.

Experience: Taught elementary vocal music for Stillwater Public Schools for 12 years; the past two years have been technology Trainer for Stillwater Public Schools.

Professional Memberships: National Education Association  
Association for Supervision and Curriculum Development

Name: Shawn Kevin Gregory

Date of Degree: May, 2009

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: LIVED EXPERIENCE OF PRIMARY TEACHERS USING  
INTERACTIVE WHITEBOARDS IN THEIR CLASSROOMS

Pages in Study: 71

Candidate for the Degree of Master of Science/Arts

Major Field: Curriculum and Leadership Studies

Scope and Method of Study: This study was a phenomenological inquiry in teacher use of Interactive Whiteboards in the primary classroom. The study was conducted through observations and interviews with three teachers who use the Interactive Whiteboard in their practice. The goal of the study was to find how having this technology in the classroom has changed their pedagogical styles. The study also looked at the teachers' technological skill development as they use the board.

Findings and Conclusions: This study found that the interactive whiteboard helped to create teachable moments. The themes that emerged are: teachable moments, automaticity, collaboration and community, and lost time. Teachers developed automaticity in using the interactive whiteboard. Through collaboration and community teachers increased their technological self-efficacy and knowledge of the interactive whiteboard. The participants in the study found that they lost track of time when creating lessons and teaching lessons for the interactive whiteboard. This study has implications for technology placement in the classroom and shows a need for sustained and quality professional development.

ADVISER'S APPROVAL: Dr. Pamela U. Brown

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