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Interactive White Board Use in a Second Grade Classroom During Content Area Lessons

Danielle Powers

The College at Brockport, powersd3@gmail.com

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During Content Area Lessons**

by

Danielle Powers

May 2011

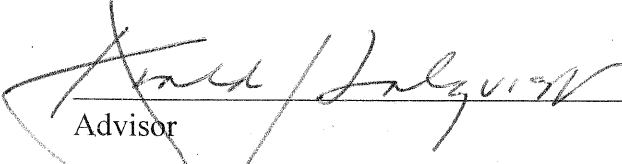
A thesis submitted to the Department of Education and Human Development of The
College at Brockport, State University of New York in partial fulfillment of the
requirements for the degree of Master of Science in Education

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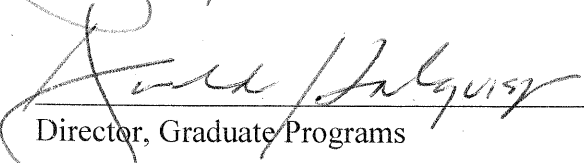
Danielle Powers

APPROVED BY:



Advisor

05.05.11
Date



Director, Graduate Programs

05.05.11
Date

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Chapter 1: Introduction

Throughout the past decade, technology has been integrated into nearly every facet of everyday life: From using a cell phone as an alarm clock, to using computers for various purposes and communicating with friends and family through a variety of technological means. Even within the elementary classroom, technology now comes in many shapes and sizes and can serve a variety of purposes. Classroom technology can range from an Interactive White Board (IWB) that consumes an entire wall and is the focal point of a classroom, to individual handheld student responders that are no larger than a calculator. Villano (2006) states that “statistics show that kids prefer to learn in a visual world and like to have information at their fingertips” (p. 16). Technology such as computers and Interactive White Boards (IWB) can provide that extra source of enthusiasm and engagement for students that otherwise could be lacking in a “traditional classroom” setting. Le Breuilly (2004), an educational consultant reports that “they [IWBs] have been hailed as a revolutionary resource for raising pupils’ literacy levels and their motivation” (p. 26). This way of thinking could cause a shift away from a more traditional teacher-centered environment to that of a more interactive, student-centered classroom. I agree with Villano (2006) when he says that technology is “a conduit for a new learning paradigm” (p. 17).

Significance of Problem

Technology is beginning to take on an increasing importance within the classroom. According to Clarke and Besnoy (2010), in order to keep up with this increase in technology we need new definitions, new ways to look at curriculum, and new instructional practices. We need to make sure that our students' learning is relevant to both their current lives and the world they will enter as adults. (p. 48)

If using technology is such a large part of life and society, why should teachers have to even think twice about finding an effective way to integrate it into the classroom? Because students are becoming more accustomed to using technology in their everyday lives, both in and out of school, they are at an advantage compared to students of previous generations. However, often in the classroom, it is the teachers who determine whether technology is implemented in a constructive and educational manner for the students. The use of technology can provide alternative modes of delivery to the "traditional" classroom lessons and it has the potential to reach students with a variety of learning styles. Imagine taking virtual tours of world landmarks, meeting a class of pen pals from miles away via a video conference, or simply being able to reorganize writing ideas by moving them around with a finger! With the advances in technology over the past decade, all of these things and more are possibilities in the classroom.

While research on instructional and educational technology is starting to become more popular, however, due to the relative newness of the topic and the recent surge

of technological advances, there is still a lack of research in this particular field. With the introduction of technological tools such as IWBs, document cameras and student response systems, in my opinion, educators must determine the value of these tools from an effective educational standpoint. Although a variety of studies have been conducted related to integrating technology into the classrooms of older students (Agee & Altarriba (2009), Clarke & Besnoy (2010), Daniels (2004)), there have been a limited number of studies conducted regarding technology in the elementary classroom, in particular, a second grade classroom. According to Agee and Altarriba (2009),

even with a growing number of studies on adolescent computer use, less is known about younger adolescents' conceptions of computer technologies, how their literacy skills affect their views and uses, and how these technologies are part of their daily literacy practices. (p. 363)

Because of the advances that have been made in technology recently and their increased presence in schools in a variety of forms, such as IWBs, document cameras and student response systems, technology is playing an increased role within classrooms and, in my opinion, it is imperative that its effectiveness be examined.

In 1991, SMART Technologies introduced the first Interactive White Board (IWB), however, due to a variety of factors such as skepticism, lack of compatible technologies and lack of information, the product did not become popularized until nearly a decade later (SMART, 2009). Now many schools and classrooms have the capability to support these specific technology products, and it is my belief that

research must be conducted in order to determine the overall value of having IWBs within the school and individual classrooms. I also believe that it needs to be determined if the cost of the product as well as other required technologies and training/professional development for staff needed to use it effectively are worth the investment for school districts. Also, the school and/or district needs to be able to maintain the equipment in order to ensure that teachers are able to use the available technology effectively in their classroom on a regular basis. If the school district chooses to invest in IWBs, teachers must also be willing to use them and must be able to use them effectively.

Purpose of this Study

As a future literacy specialist who is part of a generation that has seen the steady rise of technology in everyday life, I feel that it is imperative for educators to determine the effectiveness of technology, especially IWBs, in the schools. Due to the seemingly endless possibilities that technology appears to offer, how it can best be used to meet the needs of all students is essential knowledge to have as a teacher, in my opinion. The purpose of this study, then, is to explore the impact that technology in the form of IWBs can have within the elementary classroom, specifically at the second grade level. The question this study will answer is:

- ☆ How does the use of an Interactive White Board (IWB) impact second graders' involvement and engagement during content area lessons?

Within the school in which I will conduct this study, there is one interactive white board in a classroom at each grade level in the elementary classrooms. The teachers in these rooms are encouraged to use the interactive white boards to enhance their lessons, which in turn, are supposed to enhance student learning and overall understanding. Teachers choose to use this form of technology in a variety of ways in order to help enhance student learning and increase student involvement and motivation. Some teachers use them as a display screen, while other use some of the features to make their lessons more interactive for students.

The participants in this study will be a class of second graders from the elementary school in which I teach. The particular classroom does not have an IWB, however, the teacher and students have the opportunity to use an IWB on a regular basis in other classrooms and in the school's computer lab. The students have varied levels of experience using the IWB from first grade.

During the study, I will collect data through observations during lessons of three different content areas English Language Arts (ELA), Math and Theme (Science, Health and Social Studies). Half of the lessons I will observe will not incorporate the use of an IWB, while the other half of the lessons will have the IWB incorporated into the lesson. During the observations, I will collect observational data regarding student behaviors as well as levels of participation and engagement throughout the lesson. I have created a recording sheet has specifically for use during this study (see Appendix A).

After the observation sessions, I will have the students complete a short survey regarding their feelings about the use of an IWB during lessons (see Appendix B). Students will expand on their responses in order to help provide more in-depth insights to their thoughts. I will conduct interviews with three students in the form of having informal one-on-one conversations with them in order to have them elaborate on their responses and opinions regarding IWB use in their classroom. I will also conduct interviews with the cooperating classroom teacher and a teacher who has an IWB in their classroom. The interviews will provide teachers' perspectives on the use and effectiveness of IWB use in the elementary classroom setting.

Rationale

The technological advances that continue to be made in today's society are impacting the lives of adults, and children, everywhere, including within a classroom setting. Lai, Chang and Ye (2006) examined if and how computer usage (instructional operations, processes, and software) impacted reading interest and achievement of fourth grade students. The researchers found that while student reading interests were usually positively influenced by computer usage, reading achievements of those students who regularly used computers were significantly higher than those students who did not (Lai, Chang, Ye, 2006).

Mouza (2005) conducted a study regarding technology usage within the elementary classroom and examined how a common theme (*100 days of school*) could be integrated with technology to enhance student performance. The study was

conducted with lower elementary students in Kindergarten, first and second grade. The results of the study showed three positive impacts of technology: increased student motivation and persistence in doing school work; enhanced learning in the areas of literacy and mathematics; and increased student confidence, which encouraged the growth of social skills as well as peer teaching and collaboration. While this study will not be based on a specific content theme, it will compare levels of student engagement when an IWB is used to their engagement when one is not used.

The use of computer games is yet another way teachers can incorporate a different form of technology into the elementary classroom. Owston, Wideman, Ronda and Brown (2009) conducted a study of fourth grade students who both developed their own computer games and played their classmates' games and determined that students thought more critically about the material and therefore had a greater understanding.

In this study, I will look at the behaviors of second graders to understanding the impact a IWB has on the students' participation and engagement during content area lessons.

Summary

Technology is quickly finding its way into each and every aspect of our lives, including in the elementary classroom. Many students have grown accustomed to having computers in their classrooms and now newer technologies, specifically

IWBs, have entered the classroom and have the potential to help them to be successful. Because technology is constantly advancing and taking on a bigger role in the classroom, I believe that it is imperative that teachers are able to effectively integrate its many uses in ways that will benefit our students. Too often in the classroom technology is used in its most basic form and students are not given ample opportunities to reach their potential through the use of technology. For example, students use the computers to play games or word process a document or teachers use a projector or document camera to simply display information rather than using the available technology to create interactive lessons. By using technology, such as IWBs, teachers can create interactive lessons and students can become a part of the lesson and gain a better understanding of the content. Conducting this study will, I anticipate, reveal the positive role technology, in the form of an IWB, can have on student engagement during content area lessons.

Chapter 2: Literature Review

Various forms of technology serving a variety of purposes have filtered throughout our ever-changing society. From home to school and work to recreational settings, technology is becoming increasingly more prominent. Within the elementary classroom setting, technology can take on a multitude of forms, including Interactive White Boards (IWBs), and can serve a variety of purposes. According to Shenton and Pagett (2007), “IWBs, with their various typefaces, colors, images and animations, are part of a technological revolution in classrooms, that began with radio in the 1950s, and have encompassed television, film, video, computers and CD ROMs” (p. 129). If using technology is such a large part of life and society, why would teachers have to even think twice about finding an effective way to integrate it into the classroom? According to Villano (2006), statistics show that “kids prefer to learn in a visual world and like to have information at their fingertips” (p. 16). Technology can provide that extra source of enthusiasm and engagement for students that otherwise could be lacking in a “traditional classroom” setting. Some cases can be made to support that technology is “a conduit for a new learning paradigm” (Villano, p. 17). This chapter contains a review of previous research that has been done related to technology use in a classroom setting and is organized into the following categories: Technology in the Classroom, Student Engagement and Motivation, Technology in the Form of the Internet, Interactive White Boards, and Teachers and Technology.

Technology in the Classroom

With the increasing and rapid development of technologies over the past decade, the demand for technological “education” also increases, in my opinion. Because of the increased exposure to a variety of technologies at such a young age, the generation of students who are currently in school hold technology in a different light than those of older generations. According to Owston, Wilderman, Sinitskaya & Brown (2009), there is a

new generation of learners, frequently referred to as ‘digital natives’, [who] are regularly immersed in a wide variety of new electronic media and as a consequence are developing knowledge and skills that increasingly diverge from those that are valued in school.” (p. 977)

Some of these students seem to know more about technology and computers, in general, than some of their teachers which can have both positive and negative effects in the classroom. Positive factors include students being able to easily understand and use technology that may be present in their classrooms, if they are given the opportunity. According to a fourth grade teacher in a study conducted by Barone & Wright (2008), “Technology. Kids don’t see laptops, MP3 players, cell phones, PDAs, DVD players, and video games as technology, it’s just life. Schools need to connect education to their students’ lives with technology” (p. 298). A possible negative effect is that some teachers may be intimidated by newer technologies and “worry that they would have to spend more time dealing with technology than actually teaching and that they will not know enough about the technology

themselves” (Clarke & Besnoy, p. 48). If teachers choose to not integrate the available technology into their classrooms, their students may potentially be at a disadvantage.

Ogura, Coco and Bulat (2007) analyzed how the use of an innovative technology-enhanced program affected the early literacy skills of learning disabled students in a K-1 classroom. The study showed increased student motivation, independence in learning and fewer negative behaviors during lessons.

Student Engagement and Motivation

Keeping students engaged and motivated throughout a lesson can lead to a more complete understanding of the material being presented. “Student engagement in learning in school is an important and well-documented predictor of academic achievement in general, as well as in specific subject areas including reading” (Lutz, Guthrie & Davis, p. 3). Incorporating technology, in the form of an IWB, into these lessons, provide motivation for students because lessons are more interesting which leads to improved attention and behavior (Smith, Higgins, Wall & Miller, p. 96).

It has been found that students have a variety of learning styles that can be characterized into three major categories that include: auditory, visual, and kinesthetic (Gardner, 1983). While many students use a combination of styles, many rely more heavily on one style in particular (1983). Classroom technologies, IWBs in particular, can easily be used in a variety of ways that effectively meet the educational needs of students of all ages regardless of the potential differences in

learning styles and/or content areas. The versatility of technology lends itself to different learning styles simply because it has the capabilities to reach students through a variety of means (Austin, 2003). The IWBs are a very effective form of technology that can easily be used to help meet the needs of students with a variety of learning styles. “Another feature of IWBs, which is claimed to promote learning, is their multimedia and multi-sensory capacity. The presentation of stimulating visual images is claimed to enhance pupils’ recall. The multi-sensory input made learning more memorable [for students]” (Smith, Higgins, Wall & Miller, p. 97). Every student within a classroom does not learn in the same way therefore, by being able to appeal and attend to auditory, visual and kinesthetic learners teachers can be more effective by incorporating relevant features of the IWB into their lessons.

Lessons which employ the use of technology are oftentimes not only more interactive, but also more eye-catching and stimulating for the students. A fourth grade geometry lesson was created on an IWB and modeled after the game show Concentration in which students manipulated pictures and matched them to their name. In the same classroom, the spotlight feature on the particular IWB that was being used was utilized to emphasize specific vocabulary words in a piece of writing (Villano, 2006). Appealing to and incorporating student interests into lessons can help to hold their attention and in turn help them to understand the material that is being presented.

Technology in the Form of the Internet

One of the primary forms of technological interactions is through the Internet. According to Dillman (2010), as of August 2010, approximately 77 percent of the population of the United States has access to the Internet. In addition, Robinson (2009) reports in her study of California youth that the highest percentage of respondents, 30 percent stated that they average three to six hours per week on the Internet. Because of the easy availability of the Internet people of all ages tend to heavily rely on its use for various aspects of daily life (2009).

Think about your everyday life and how often you are on the Internet and chances are good that you not only use the Internet as a communication tool, but for an educational tool as well. We communicate frequently through emails as well as social networking sites such as Facebook, MySpace and Twitter. The Internet allows anyone to access millions of websites, thousands of databases and an overall wealth of knowledge by simply typing key words into any one of hundreds of search engines and having results at your fingertips (Schofield & Davidson, 2003).

The Internet also provides a source of entertainment for users. From sharing videos on sites such as YouTube to catching up on your favorite television shows, you can watch just about anything online. Online games are also a huge source of entertainment for people of all ages. From online poker games for adults to Webkinz World and Club Penguin sites for kids, the Internet has a game for everyone.

Because of the vast number of ways the Internet can be used, schools can use the Internet as supplemental sources for their classrooms. From research to games,

the Internet can be easily integrated with the classroom curriculum for any grade level (Schofield & Davidson, 2003). Sun, Lin and Yu conducted a study that examined how a web-based lab learning environment could influence the effectiveness of science instruction at a fifth grade level. The study found that classrooms that participated in the web-based lab procedures had higher scores on the post-assessment than those who participated in the traditional science class settings (Sun, Lin & Yu, 2008). It is up to teachers to find ways to incorporate effective Internet usage into their classrooms and the use of IWBs, in combination with the Internet, can display all of the positive aspects the Internet has to offer within the classroom to benefit students.

Interactive White Boards

Outside of school, students seem to be spending more and more time playing computer and games (Lai, Chang & Ye, 2006). It would seem to me that if schools could somehow incorporate this “video game” mentality into the classroom, then some of these students may be more likely to become involved and engaged with the lesson. Interactive whiteboards (IWBs) are an up and coming technology that more schools are starting to actively and effectively use. Interactive whiteboards are, according to Smith, Higgins, Wall & Miller (2005), “large, touch-sensitive boards, which control a computer connected to a digital projector” (p. 91). According to Villano (2006), a fourth-grade teacher in Waldorf, Maryland reports that youngsters are drawn to video games and therefore by using an interface such as an IWB,

learning seems more like a video game and therefore students are more interested. By incorporating technology and appealing to student interests, lessons and teachers can be more effective because students are more likely to want to become engaged with the lesson (Smith, Higgins, Wall & Miller, 2005). Because students of this generation are constantly immersed in a world of media images it is essential that we [teachers] bring this stimulation into the classroom in order to satisfy the expectations of students (Smith, Higgins, Wall & Miller, 2005).

The use of IWBs offers a viable option for teachers as a way easily incorporate all learning styles and present lessons in a visually appealing and interactive manner. Because IWBs can offer not only visually appealing lessons, but also interactive lessons for a range of learners, if used correctly, they can be invaluable in a classroom setting for both teachers and students (Austin, 2003).

Teachers and Technology

Because technology is ever-changing, it is imperative that teachers stay up to date on the technologies that are available to them in an effort to integrate the available technologies effectively (Mouza, 2002). Knowing what the technology is and being able to effectively incorporate it into classroom instruction are two different things. Teachers must be provided with the knowledge and skills that they need to use the technology to best meet the needs of their students, through professional development. Professional development can enhance teacher understanding and, in turn, improve student performance (Onn, 2010). Teachers must

receive the proper initial training for any technology, including and IWB that they will use in their classroom in order to make effective use of them (Smith, Higgins, Wall & Miller, 2005). Although teachers may undergo initial training sessions, the importance of continuing education, in the form of professional development, is essential to keep teachers up to date on the ever-changing technology they are expected to use while teaching (Onn, 2010). Knezek and Christensen (2007) conducted a study that examined the relationship between technology related professional development sessions attended by teachers and their first and second grade students' reading achievement. The results of the study showed an increase in reading accuracy at both grade levels and an increase in reading comprehension at the second grade level in the districts where teachers received technology related professional development (Knezek & Christensen, 2007).

The introduction of technology can have a snowball effect within the classroom setting. Teachers are expected to utilize the new technology and utilize it efficiently and effectively, which may significantly alter their teaching styles. In order to account for these expected changes, teachers can attend professional development sessions, which may interrupt their routines and instructional time in the classroom. Initial training sessions offer a brief introduction to the technology; however, further professional development is necessary to further explore the technology and programs that help to enhance it (Mouza, 2002). By nature, teachers revert to teaching styles they are comfortable with and experiences they had as students (2002). "Effective professional development is organized around real

problems of practice, provides access to outside resources and expertise, draws support from the community and is modeled around adult learning theories” (Mouza, 2002, p.273). Taking advantage of high-quality professional development opportunities and putting what is learned into classroom practice is one way to become more accustomed to technology and how to integrate it into the classroom. “While quality professional development opportunities in the use of technology are rare, evidence exists that both skill-based and integration training make a positive difference for the teachers who receive it” (Mouza, 2002, p. 274). Adequate teacher preparation, especially regarding technology in the classroom, benefits everyone involved (Smith, Higgins, Wall & Miller, 2005). As in any field, tools are only of value if they can be used effectively and efficiently.

Chapter 3: Methods and Procedures

In this chapter, I provide an overview and explanation of the methods and procedures that were used throughout the study. The purpose of this study was to explore how the use of the technology, specifically an IWB, influenced the learning processes of a class of second graders during content area lessons. Through the study, observational and interview data were collected to answer the question: How does the use of an Interactive White Board (IWB) impact second graders' involvement and engagement during content area lessons?

Participants and Context

Twenty two second grade students (ages 7-8) from a suburban school in western New York were invited to participate in this study. The school has approximately 350 students and of those students, approximately 70 percent of them are Caucasian. The other 30 percent of the student population is made up of Black (14 percent), Hispanic (11 percent), and Asian (5 percent) students. Within this school, approximately 20 percent of the students receive a free or reduced lunch.

The particular class that participated in this study was comprised of 12 male and 10 female general-education students with one teacher and a one-to-one aide for one child. Fourteen of the students are Caucasian and eight are Black. Seven students receive additional academic services either for math, English language arts

(ELA), or both and one student has an Individual Education Plan (IEP). Eight students receive a free or reduced lunch.

Within the classroom there are three computers that the students have access to for different activities such as centers, math workshops, composition of writing pieces and educational games throughout the day. Approximately three to five times per week, the class had the opportunity to use an IWB either in another classroom or in the computer lab for content area related lessons ranging from 30 to 45 minutes. The class also spent 45 minutes per week in the computer lab usually working on a learning-to-type program or playing educational games related to classroom instruction and grade-level curriculum. Currently, one classroom at each grade level has an IWB installed and there is also one available in the computer lab. For all of the classrooms without an IWB, a projector and screen are provided and in many cases a document camera is also provided for use within the classroom.

For the purposes of this study, I conducted an interview with two second grade teachers. The first interviewee was the cooperating second grade classroom teacher, a white, 37 years old female who has been teaching in the school district for twelve years and has taught second grade for the last five years. She has taken a professional development course on using an IWB in the classroom and this is the second year she has access to an IWB. The second interviewee was also Caucasian and teaches second grade in the same building. She had an IWB installed in her classroom last year and has also attended the professional development course. She is

39 years old, has been teaching in the school district for nine years and has taught second grade for the past seven years.

Convenience, accessibility and the willingness of the classroom teachers to participate in the study provided the basis for my participant selection. Throughout the study, all participants are referred to by a pseudonym to ensure confidentiality of everyone involved in the study.

My Positionality as the Researcher

I am a one-to-one aide in the classroom where the study took place. This is my first year as a one-to-one aide and my primary responsibility is working with a student with behavior issues when he needs additional support and I support other students in the class as needed. I am certified to teach regular education classes, grades 1-6. I will be certified as a reading specialist after completing my master's degree in childhood literacy education. I have previously been a teaching assistant in the reading center and have held long term substitute positions in first and second grade in the school in which I will conduct the study.

I have taken a professional development class (two 90-minute sessions) on IWB use in the classroom, have implemented a variety of lessons using an IWB with different groups of students and in general am very comfortable with technology. As a teacher, I try to incorporate technology, including IWBs, document cameras, student responders, websites and computer programs whenever possible in the

classroom and want to determine how it impacts student engagement and behavior during lessons.

Data Collection

In order to gain the most holistic and comprehensive perspective of how an IWB impacts the second grader' involvement and engagement during content area lessons data was collected from a variety of sources during the six week study.

Content Area Lesson Observations

I observed 18 content area lessons during the six week study. In nine of the eighteen lessons the teacher and/or the students used an IWB. For each observation session, I used a checklist to document and record student involvement and participation (see Appendix A). The recording sheet contained each student's name and a series of boxes or categories that were used to record the students' behaviors throughout each lesson. Student behaviors that were observed were categorized in the following ways:

- ☆ Students were distracted, exhibiting such behaviors as talking, playing with shoes/clothing/hair, looking around the room and/or playing with items in/at their desk, laying down/having their head down.
- ☆ Students were watching the lesson, eyes on the speaker, and appeared focused, however were not actively participating by raising their hand or offering responses or thoughts during the lesson.

- ☆ Students were engaged and participating in the lesson, volunteering answers and/or participating in the discussion.

Overall student behavior was categorized based on a general observation of the students' average level of engagement throughout the lesson.

A separate recording sheet was used during each observation. The format of the recording sheet did not change based on whether or not an IWB was being used. Because the same teacher will taught each lesson, I her teaching style and approaches, language, and class management strategies remained relatively consistent across all content lessons observed.

Student Survey

Each of the student participants individually completed a six-question survey (see Appendix B) regarding their thoughts and attitudes of using an IWB for content area lessons at the end of the six week study. I conducted the survey in a whole group setting in order to help ensure student understanding of questions and possible responses. Of the six questions, four questions (2, 3, 4, 5) had responses that fell on an interval scale (I don't like it, It's ok, I like it or No, Sometimes, Yes). The other two questions (1, 6) had multiple-choice type nominal responses. Questions 2 – 6 also provided space for additional comments and explanation of the response.

Teacher Interview

I interviewed the cooperating teacher as well as another second grade teacher who uses an IWB on a daily basis during a variety of content area lessons in order to gain insights into their experiences with this form of classroom technology and their thoughts regarding its integration into an elementary classroom setting. Appendix C contains the interview questions.

Data Analysis

Observation Data

After each observation session, I reviewed and tallied the results based on the students' level of engagement: engaged, watching, or distracted. After I had completed all of the observation sessions, I compiled the data from all of the sessions to form a comprehensive set of data, including charts and graphs to determine patterns of student behaviors during different types of lessons. By the conclusion of the observations I was able to draw comparisons between the different lesson types and student involvement. These conclusions coupled with the findings from the student survey data provided beneficial information and enabled me to draw conclusions based on the research question.

Student Survey Data

I compiled, reviewed, analyzed and then charted the students' responses to the survey questions in order to gain an insight into the students' feelings about and perceptions of using the IWB during content area lessons.

Teacher Interview Data

Information from the teacher interview was transcribed verbatim and were used as a third source of data to help me answer the research question explored during this study. Interview transcriptions were coded for patterns and themes.

Procedures

- ☆ Over a period of six weeks beginning in January 2011, I observed 18 different content area lessons lasting approximately 35 minutes.
 - Six math, six English language arts and six theme (science, health or social studies).
 - Three of the six lessons in each of the content areas involved the use of an IWB.
 - Two to four content area lessons were observed per week, some involved an IWB while others did not.
 - Observations of student behaviors and involvement were recorded for each lesson on a separate recording sheet.

- ☆ I analyzed the observations of student behavior at the conclusion of each session in order to reveal patterns regarding student involvement and engagement across the content area lessons.
- ☆ During the fourth week of the study, I conducted an interview with two, second grade teachers.
 - One teacher was the cooperating classroom teacher who did not have an IWB in her classroom.
 - One teacher was the second grade teacher who does have an IWB installed in her classroom.
- ☆ At the conclusion of the 18 observation sessions, during the sixth week, I administered the student survey in a whole group setting.

Criteria for Trustworthiness

I believe that the length of the study and the observations of a cross section of content areas lessons contributed to the trustworthiness of the study. The interview was transcribed verbatim and was coded for patterns and themes. The data from the lesson observations, the student surveys and teacher interviews enabled me to triangulate the data to help ensure validity of the study's results. Throughout the study, I engaged in a process of continuous interpretation of the data that was collected, looking for any additional themes or new questions or considerations that may have been raised.

Limitations

As is true of all studies, this study was bound by a variety of limitations. Due to the field of participants – one classroom of second grade students in a suburban, western New York elementary school – that were observed for this study, generalizations regarding this study’s results were limited. The participating teacher’s methods of instruction and technological preferences in addition to the overall content of the lessons that was observed may also have impacted overall student involvement and engagement during particular lessons, and thus should be considered a limitation. In addition, because the lessons that involved an IWB will be conducted outside of the “home” classroom setting, student behaviors may have varied slightly based on the environment.

Chapter 4: Findings

The purpose of this study was to explore the impact that the use of an Interactive White Board (IWB) could have on second grade students' involvement and engagement during English language arts, math and themed lessons. Through the use of observations as well as student surveys and teacher interviews, I was able to gather information to gain the opinions and perspectives of both second grade students and teachers.

In this chapter, I present my descriptions and analysis of the data that I collected during each of the three processes of data collection. Data includes observations of student behaviors during content area lessons, results of a student survey and teacher interview responses. I have also included a discussion related to how the findings align with my research question: How does the use of an Interactive White Board (IWB) impact second graders' involvement and engagement during content area lessons?

Lesson Observations

Of the eighteen lessons I observed, six were math, six were English language arts and six were theme (science, health, or social studies), and three of each content area or theme involved the use of an IWB. Throughout the six week observation period, I observed and recorded many student behaviors that corresponded with the three behavior categories (participating, watching or distracted). While the number of

students fluctuated depending on the content area and/or if an IWB was being used, at least one student's behavior corresponded with each category. For example, in the math lessons that did not incorporate an IWB, 52 percent or 33 of the students were participating, 27 percent or 17 of the students were watching and 22 percent or 14 of the students were distracted. Although student participation increased to 68 percent or 44 of the students when an IWB was being used in math lessons, there were still 18 percent or 12 of the students watching the lessons and 14 percent or 9 of the students who were distracted during the lessons (See Table 4.2 and Figure 4.2). Distracted behaviors were present in all 18 of the observed lessons and many of the behaviors were repeated regardless of the type of lesson (content area or use of IWB).

Distracted students consistently talked, played with items near them, wandered around the room and/or were not sitting in their seats appropriately. Regardless of the content area or use of an IWB, distracted behaviors usually presented themselves later in the lessons rather than at the beginning.

The lessons I observed lasted between fifteen and thirty minutes each and covered a range of topics. During the ELA lessons, the teacher focused on sentence structure, adjectives and descriptive writing and poetry. During the math lessons the teacher focused on content that included data representation, organizing and classifying data and number patterns (repeated addition). During the theme lessons, the teacher covered the topics of communities and community helpers, dental health and life cycles of mealworms. Because the content of the lessons was similar,

regardless of IWB use, I do not believe that the content impacted or skewed the data in any way.

Throughout the 18 lessons that I observed, the teacher invited the students to participate in a variety of ways. Sometimes the teacher asked the students to participate as a group (i.e., show of hands, small group sharing, or working in partners) and in other cases student participation was on an individual level (i.e., sharing thoughts or ideas or demonstrating work). The teacher often posed open-ended questions, allowing students freedom to express their ideas.

When the teacher asked the students to share thoughts and ideas during lessons involving the IWB, in most cases their responses not only involved verbal sharing but also physically going up to the IWB to demonstrate their thoughts or manipulate information on the screen. The teacher utilized many features in the SMART Notebook software to enhance her lessons and make them more interactive for the students. For example, during one of the sentence structure lessons, students were able to use the “spotlight” feature to highlight different parts of the sentence and different sort features were also incorporated. Math manipulatives were “brought to life” on the IWB when students interacted with and changed them, all with the touch of a finger. The IWB also allowed students to take a virtual tour of a child’s mouth to identify different teeth and explore potential dental issues. While some students participated on a regular basis, regardless of the lesson content, more students volunteered if it was clear they would be using the IWB as part of their response.

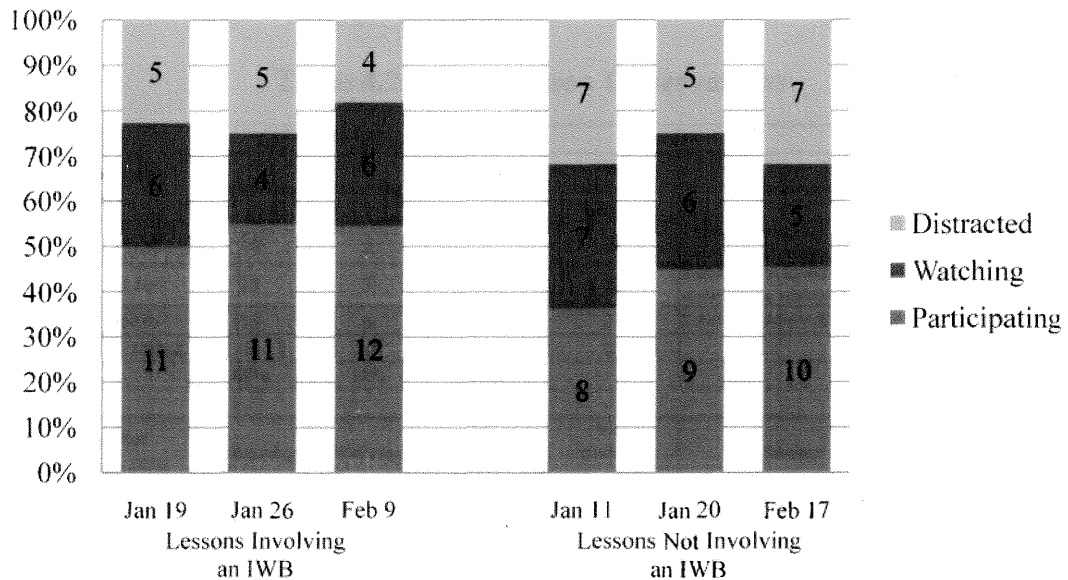
English Language Arts Lessons

The six ELA lesson observations showed the least variance in student behavior when comparing the lessons that involved the teacher's use of an IWB with those that did not (See Table 4.1 and Figure 4.1). This may be a result of lower student interest levels in ELA lessons and content covered within these lessons.

Table 4.1: ELA Lesson Observations

ELA		TYPES OF BEHAVIORS				
Lessons Involving an IWB		Participating	Watching	Distracted	# of students present	Summary of Distracted Behaviors
Date	19-Jan	11	6	5	22	3 students playing with supplies in/on desk, 1 student reading a book, 1 student writing/doing work
	26-Jan	11	4	5	20	2 students talking on carpet, 1 student constantly fidgeting/laying down on carpet, 1 student laying sideways over their chair, 1 student playing with beads in hair/shoes/clothing
	9-Feb	12	6	4	22	1 student writing/doing work, 1 student out of seat looking for something in their desk, 1 student with head down on desk, 1 student playing with supplies in/on desk
	TOTAL	34	16	14	64	
		53%	25%	22%		
Lessons Not Involving an IWB		Participating	Watching	Distracted	# of students present	Summary of Distracted Behaviors
Date	11-Jan	8	7	7	22	4 students talking (2 groups of 2), 2 writing/drawing, 1 student repeatedly out of seat and moving around room
	20-Jan	9	6	5	20	2 students playing with hair/clothing/shoes, 1 student playing with item found on floor near carpet, 1 student flipping through/reading a book, 1 student looking around the room/out the window
	17-Feb	10	5	7	22	3 students playing with supplies in/on desk, 2 students talking/laughing with each other, 1 student laying sideways over chair, 1 student drawing/writing
	TOTAL	27	18	19	64	
		42%	28%	30%		

Figure 4.1: ELA Lesson Observations
ELA Lesson Observations



While the number of students in each category varied slightly with each lesson, an additional 11 percent or seven of the students were participating in the lessons that involved the use of an IWB. There was an eight percent or five student increase in distracted behaviors in lessons that did not involve the use of an IWB. The distracted behaviors that occurred during both types of lessons were similar. For example, regardless of if an IWB was being used, there were students talking and students playing with things in/on their desks or at the carpet.

Math Lessons

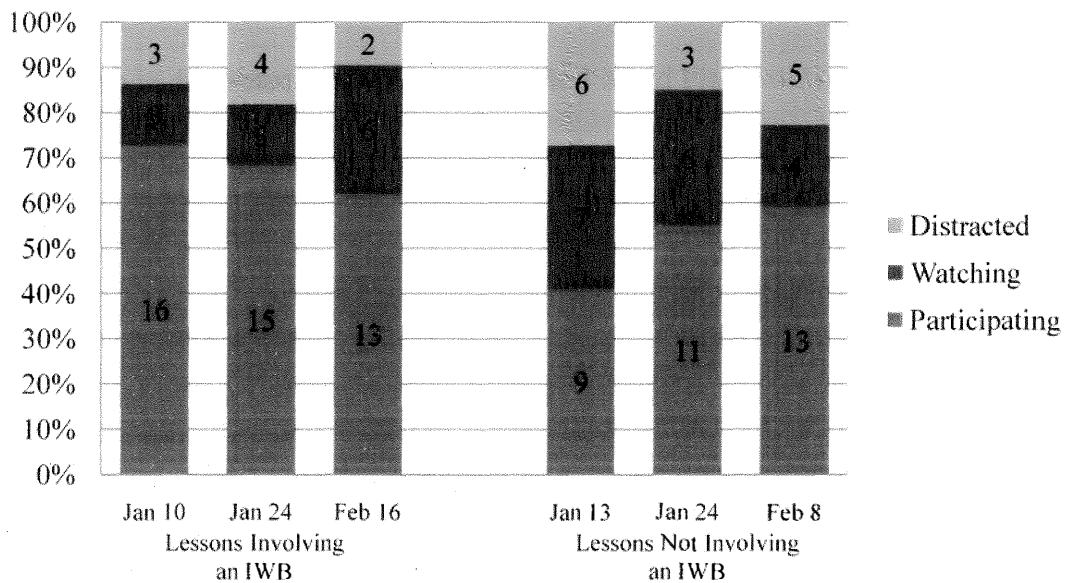
Throughout the six math lessons that I observed I noticed that similar themes emerged. The lessons that involved the use of an IWB had a higher percentage of students who were participating than in those lessons that did not incorporate an IWB.

The differences in participation were higher during math lessons than during ELA lessons (See Table 4.2 and Figure 4.2).

Table 4.2: Math Lesson Observations

MATH		TYPES OF BEHAVIORS			# of students present	Summar of Distracted Behaviors
Lessons Involving an IWB		Participating	Watching	Distracted		
Date	10-Jan	16	3	3	22	1 student playing with edge of carpet, 1 student watching student playing with carpet, 1 student playing with shoes
	24-Jan	15	3	4	22	3 students playing with pencils/erasers/items in on desk, 1 student laying sideways over their chair
	16-Feb	13	6	2	21	2 students talking with one another while on the carpet
	TOTAL	44	12	9	65	
		68%	18%	14%		
Lessons Not Involving an IWB		Participating	Watching	Distracted	# of students present	Summar of Distracted Behaviors
Date	13-Jan	9	7	6	22	2 students playing with their hair, 1 student playing with shoes, 1 student laying sideways over their chair, 1 student repeatedly out of seat (drink, tissue, bathroom), 1 student laying on carpet
	27-Jan	11	6	3	20	2 students talking with one another on carpet, 1 student playing with shoes/clothing/looking around room
	8-Feb	13	4	5	22	3 students playing with manipulatives (connecting cubes), 1 student drawing on paper, 1 student with head down on desk
	TOTAL	33	17	14	64	
		52%	27%	22%		

Figure 4.2: Math Lesson Observations
Math Lesson Observations



Once again, many of the students fell into the same categories regardless of whether or not an IWB was being used. The Math lessons in which the teacher used an IWB showed a 16 percent or 11 student increase in participation over those lessons which did not utilize an IWB. At the same time, the percentage of students watching the lessons and distracted throughout the lessons decreased by nine and eight percent, or five students respectively, when the teacher was using an IWB during a math lesson. The distracted behaviors were similar during both types of math lessons, however, the number of students displaying distracted behaviors during lessons decreased when an IWB was used.

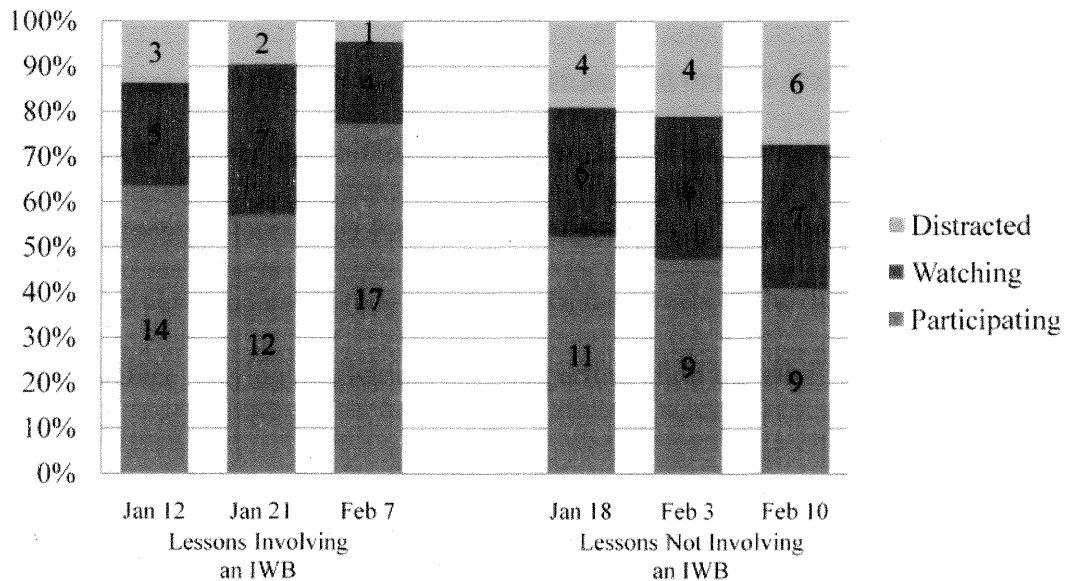
Theme Lessons

While similar patterns emerged, the six Theme lessons that I observed showed the largest differences in student behaviors based on whether or not an IWB was being used. Lessons involving an IWB showed an increase in participation and a decrease in distracted behaviors (See Table 4.3 and Figure 4.3).

Table 4.3: Theme Lesson Observations

THEME		TYPES OF BEHAVIORS			# of students present	Summary of Distracted Behaviors
Lessons Involving an IWB		Participating	Watching	Distracted		
Date	12-Jan	14	5	3	22	2 students talking on side of carpet, 1 student playing with books
	21-Jan	12	7	2	21	1 student looking around the room out the window/daydreaming, 1 student playing with glasses/shoes/clothing
	7-Feb	17	4	1	22	1 student laying across chair
	TOTAL	43	16	6	65	
		66%	25%	9%		
Lessons Not Involving an IWB		Participating	Watching	Distracted	# of students present	Summary of Distracted Behaviors
Date	18-Jan	11	6	4	21	2 students playing with pencils/erasers/supplies in desk, 1 student cutting paper with scissors, 1 student with head down on desk
	3-Feb	9	6	4	19	2 students talking with each other, 1 student playing with the edge of the carpet/pencil with 1 student watching the behavior
	10-Feb	9	7	6	22	3 students talking on back corner of carpet, 1 student playing with shoes (taking them on and off) 1 student repeatedly wandering around the room (drink, tissue, bathroom)
	TOTAL	29	19	14	62	
		47%	31%	23%		

Figure 4.3: Theme Lesson Observations
Theme Lesson Observations



Theme lessons involving an IWB showed some drastic differences in student behaviors. The largest differences in the percentages of students who were participating during lessons and those who were distracted during lessons were the greatest during theme lessons involving an IWB versus those that did not. There was a 19 percent increase or fourteen students who participated in the lessons while there was a 14 percent decrease or eight fewer students demonstrating distracted behaviors during lessons. Similar to the other content area lessons I observed, students' behavior generally fell into the same categories across the observation sessions. Although similar content was covered in multiple theme lessons, how the information was presented, with or without an IWB, impacted student participation. For example, multiple theme lessons focused on different types of communities (urban, rural and suburban) and their characteristics. When presented through group discussions and looking at different settings in common children's literature, without the use of an IWB, student participation was limited to 41 percent or nine students. However, on the following day similar information was presented using the IWB and the Google Earth software. During this lesson, students could "fly" from one location with a bird's eye view and could then "walk" down the streets of the different types of communities. During this lesson, student participation increased by 5 students or 23 percent.

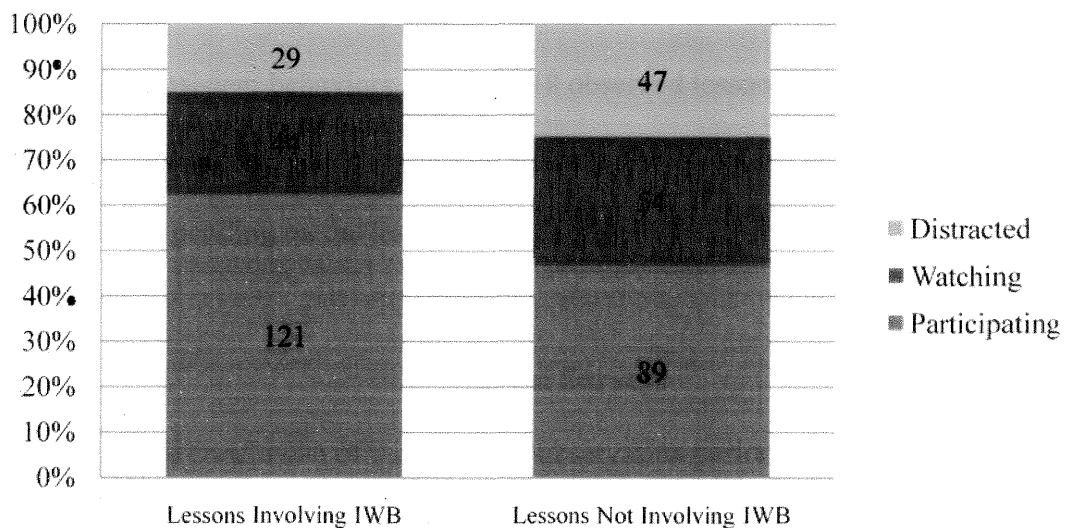
Overall Lesson Observations

When comparing the student behaviors across the content areas of the nine lessons that involved an IWB versus the nine lessons that did not involve an IWB, there was a noticeable difference in student behaviors in regards to their participation and engagement levels during the lessons (See Table 4.4 and Figure 4.4).

Table 4.4: Overall Lesson Observations

OVERALL	TYPES OF BEHAVIORS			# of students present
	Participating	Watching	Distracted	
Lessons Involving an IWB	121	44	29	194
	62%	23%	15%	
Lessons Not Involving an IWB	89	54	47	190
	47%	28%	25%	

Figure 4.4: Overall Lesson Observations
Overall Lesson Observations



Across the content areas, lessons involving an IWB throughout had a higher percentage of student participation with a lower percentage of distracted behaviors among the students. There was a 15 percent or 32 student increase in the number of students actively participating in the lesson when the IWB was being used while the number of distracted students dropped by ten percent or 18 students during these lessons. Five percent or ten of the students, who were exhibiting distracted behaviors during the lessons without the IWB, although not participating when the IWB was introduced, were at least watching the lesson rather than demonstrating distracted behaviors. Throughout the 18 observed lessons, some students repeatedly demonstrated behaviors that landed them in the same category on multiple occasions. Of the 76 distracted behaviors that were present across all 18 lessons, three students, two male and one female, accounted for 39 (51 percent) of these behaviors. Similarly, of the 210 students who participated in those lessons, six students, four males and two females, accounted for 97 (46 percent) of the participatory actions. Nine of the 22 student participants, six males and three females, demonstrated relatively consistent behaviors across all 18 observed lessons regardless of content or IWB use. The actions of the remaining students fluctuated between the three categories depending on the lesson.

Student Surveys

At the conclusion of the six week observation period, I asked the students to respond to a survey regarding their opinions of an IWB being used during content

area lessons. For the purposes of the survey, because the participants in the study refer to their IWB as a “SMARTboard”, the “SMARTboard” that is referred to in the survey is the IWB. I tallied and compiled the interval scale and nominal type responses (See Table 4.5). After choosing their response for each question, the students had an opportunity to further explain their thoughts, if they chose to do so.

Table 4.5: Student Survey Results

STUDENT SURVEY RESULTS			
Question #1		Question #2	
I learn best by...		How do you feel about the SMARTboard?	
Seeing	8	I like it	22
Hearing	3	It's ok	0
Doing	11	I don't like it	0
Question #3		Question #4	
Do you think the SMARTboard helps you learn better?		Do you think that lessons that use the SMARTboard are more fun?	
Yes	19	Yes	22
Sometimes	3	Sometimes	0
No	0	No	0
Question #5		Question #6	
Do you think you participate more when the SMARTboard is being used?		When is your favorite time to use the SMARTboard?	
Yes	14	ELA	2
Sometimes	8	Math	8
No	0	Theme	12

The first survey question showed a range of perceived learning styles of the students. While 50 percent or 11 of the students felt they were kinesthetic, or hands

on, learners, 36 percent or eight students felt that they were visual learners and 14 percent or three students felt that they were auditory learners.

Questions 2, 3, 4 and 5 required the students to use an interval scale to respond. The results indicated that the students gave positive feedback regarding the use of an IWB with this particular group of second grade students. The majority of the responses (77 of 88) had the most positive outlook (“I like it” or “Yes”). The negative type responses (“I don’t like it” or “No”) received no responses for all four questions.

The additional comments that students provided also displayed positive feelings about the IWB. Questions 2 and 5 both received unanimous responses of either “I like it” or “Yes.” The comments accompanying these questions ranged from “We can use it for lots of different things.” to “It’s like I’m playing a video game!” or “Sometimes it makes me forget we’re in school!”

For question 3 (“Do you think the SMARTboard helps you learn better?”) one student who responded “Yes” further explained that they could “see stuff and move it around, like in math when we do adding and subtracting.” Another student who also responded “Yes” stated that [during center rotations] “the votex (a sort feature in SMARTnotebook) tells us if we’re right so we don’t have to wait for the teacher.”

In terms of question 5 regarding student perspective on the participation levels when an IWB is involved, two students who responded “Sometimes” stated that they “try to [participate] but they don’t get called on” or that “everyone wants to go up [to the SMARTboard] so I have to wait my turn.” These responses reflect similar results

to those of the observation results. Content area lessons in which the teacher used the IWB had higher student participation levels than lessons in which the teacher did not incorporate an IWB.

Similar to the range of perceived learning styles, students also had a range of responses for the type of lessons they enjoyed using the IWB for (survey question 6). Theme lessons, which include science, health, and social studies, garnered 55 percent or 12 of the participant responses. Thirty six percent or eight students chose math lessons as their favorite time to use the IWB while nine percent or two respondents chose ELA lessons as the time when they enjoyed using the IWB the most. These results correlate with the findings from the lesson observations. When comparing lessons involving the IWB and those not involving the IWB, there was the least amount of variation in terms of participation during ELA lessons and the largest change in participation during theme lessons. As a result of students enjoying theme lessons more than ELA, in general, regardless of IWB use, students were more actively involved during lessons that involved content of higher interest.

Overall results of the student survey displayed the students' positive impressions and feedback regarding the use of an IWB in a second grade classroom. Student responses favored the use of the IWB across the content areas and it is apparent that students of all learning styles enjoy using it during lessons and they felt they benefit from having opportunities to use it.

Teacher Interviews

During the fourth week of the observation period, I spoke with two second grade teachers in the school in which I was observing the lessons. Both teachers shared their valuable thoughts and opinions based on their own individual experiences within their classrooms. One of the teachers, Ms. Jones, had an IWB installed in her classroom at the beginning of last school year and had unlimited access to it. She uses it on a daily basis in a variety of capacities, including calendar, content area lessons, and entertainment purposes. The second teacher, Ms. Smith, did not have an IWB in her classroom but, did have access to one, three to five times per week in another classroom. She had similar access to an IWB the previous school year as well.

Both teachers had received two professional development courses that the school district offered for IWB use in the classroom; however, both agreed that although the courses were helpful, it is just as beneficial to spend time using the hardware and software on their own to experiment, explore and create lessons that are relevant to their curriculum and their own classrooms. Ms. Jones stated, “the professional development courses provided a basic overview of the features of the board and the associated software, however, I’ve learned more by exploring on my own and trying to create my own lessons” (3 February 2011). Ms. Jones added, “I feel like there is so much that the IWB offers and because of time constraints, the professional development courses don’t do it justice” (3 February 2011).

When I asked the teachers about the differences in student engagement and/or behaviors during lessons involving an IWB versus lessons that do not involve an IWB both teachers had similar responses. They agreed that when they are using an IWB, most students *want* to participate in the lesson and in many cases “follow along” or are paying closer attention, especially when the lessons involve student interactions with the IWB. Ms. Smith even commented that “there are two students in particular who are repeatedly off task during lessons not involving the IWB. However, when an IWB is being used they are the first ones to have their hands up and are ready to participate” (3 February 2011). She also stated that “the IWB acts almost as an incentive for some students to stay on task because they may have the opportunity to interact with the board rather than just sharing a thought or response” (3 February 2011).

Benefits

Both teachers identified a variety of benefits that an IWB offers. Among them was the fact that, according to Ms. Jones, the IWB appeals to the “video and computer game mentality” of today’s students. Ms. Jones also added that, in her opinion, because many of the students are surrounded by different forms of technology in their everyday life, they are not only comfortable using it, but they actually *want* to use it, even in a school setting (3 February 2011). Another benefit of the IWB is its versatility. Both teachers agree that an IWB can support a wide range of learning styles that are present within the classroom setting and because an IWB is

connected to a computer, it provides the classroom with a seemingly endless supply of resources. From content-related pictures and videos to supplement lessons and content-specific software that can further enhance a lesson to anything that can be accessed via the Internet (3 February 2011).

The teachers both agreed that because of the versatility of the IWB and the resources that can be accessed and incorporated with it, an IWB can easily be used across all content areas. While some programs and features are more beneficial to certain areas or topics, in general it can be used effectively to help enhance lessons regardless of subject or curriculum, in one way or another. With the seemingly unlimited access to resources teachers can find, or make, an IWB can help to bring those resources alive for the students.

Drawbacks

Although limited, there are a few drawbacks of having, or using an IWB, according to the two teachers. Ms. Jones stated, "You can very easily fall into the trap of relying almost entirely on the use of the IWB during the day. Then, if for some reason the technology fails, you have to scramble to create a backup plan!" Although technology can be very helpful in a classroom setting, it can also lead to inconveniences if some aspect of that same technology becomes temporarily unavailable. For example, if a projector bulb blows out or the board is not working for one reason or another, the IWB is essentially useless. At the same time, the board

could be working and the Internet or school file servers go down and any lessons may have to be altered or put on hold until they are restored.

According to Ms. Jones, “it is very frustrating when, as a teacher, you have all of these great lessons planned using technology, and then something goes wrong and you can’t use them, or a bulb blows out and they tell you it will take two weeks to have it replaced!” Both teachers also agreed that another minor drawback to the IWB is that only one student at a time can be touching or interacting with the board at a time which can lead to frustration and impatience when dealing with an entire class of students.

Teachers’ Recommendations

In regard to advice for other teachers beginning to work with IWB, the teachers made the following statements.

Ms. Jones:…it [IWB] is a great tool for teachers. I try to incorporate it as much as possible and in a variety a ways in order to best meet the needs of my students. I know that there are teachers in this building that would love to have one [an IWB] in their room, and I am thankful that I am able to take advantage of all it has to offer on a daily basis. (Jones, 3 February 2011)

Ms. Smith: Don’t be afraid to “play” with it! When I first used it I was afraid I was going to mess something up, but the more I used it and the more familiar with the board itself and the programs the different features each offers I get, the more confident I get and the better the lessons get. Also, don’t be afraid to use lessons that other teachers have already created and tweak them to meet the needs of your own students. (Smith, 3 February 2011)

Although the two teachers who were interviewed have different levels of experience with and availability to an IWB, both offered beneficial insights regarding the use of an IWB in a second grade classroom.

Chapter 5: Conclusions and Recommendations

This study addressed the following research question: How does the use of an Interactive White Board (IWB) impact second graders' involvement and engagement during content area lessons?

In this chapter, I discuss the conclusions of the study that evolved based on the three forms of data that I collected and analyzed. I also provide several recommendations for future research, and discuss the implications for my future work as a teacher.

Conclusions

As a result of this study and the wide range of data that I collected and analyzed, it is apparent to me that the use of an IWB during content area lessons had an overall positive effect on the second grade students' involvement and engagement. Because of the positive impacts the use of this type of technology can have in a classroom setting, in my opinion, teachers should be utilizing and IWB as much as possible in order to take advantage of the many educational features an IWB has to offer.

Use of IWB Encourages Student Involvement and Engagement

According to Smith, Higgins, Wall and Miller (2005), students are motivated in lessons that involve an IWB because they are able to physically interact with the

board. The data I collected from all three sources indicate the positive effects that an IWB has on student involvement and engagement in this particular second grade classroom. The results of this study are similar to the study conducted by Smith, Higgins, Wall and Miller in 2005 when they determined that the incorporation of technology lessons and teacher can be more effective because students are more likely to want to become engaged.

The classroom observations I conducted showed that regardless of whether or not an IWB was integrated into the content area lessons, there were some students who fell into each of the three behavior categories: participating in the lesson, watching the lesson or exhibiting distracted behaviors. Although during each of the 18 content area lessons there were students in each category, when an IWB was being used, the number of students whose behavior was considered to be distracted fell by ten percent while the number of students actively participating in the lesson increased by 15 percent. When I examined all three content areas lessons individually, I noticed the same trend: an increase in the percentage of students participating and engaged in the lesson with a decrease in distracted behaviors when an IWB was being used.

When looking at the individual content areas, I noticed that most students (55 percent) chose Theme followed by Math (36 percent) and ELA (9 percent) as the areas in which they most enjoy using the IWB (Question 6 of student survey). When I further examined the students' behaviors during the individual content areas, I noticed that the data revealed that IWB use during Theme lessons, the most popular

among the students, resulted in the largest increase in participation (19 percent) with the largest decrease in distracted behaviors (14 percent). The trend continued with the second most popular subject for IWB, Math. While the math observations also showed a large increase in participation (14 percent), the distracted behaviors only dropped by eight percent.

During ELA lessons, the least popular content area for the IWB, students' behaviors were the most consistent. However, there was still an 11 percent increase in participation and an eight percent decrease in distracted behaviors. The content areas in which students enjoyed using the IWB directly correlated to the number of students participating in the lesson when an IWB was being used.

One aspect of the student survey that I analyzed was the perceived range of learning styles present among the participants. There were students who considered themselves kinesthetic or visual or auditory learners and yet the rest of the survey results revealed that they all shared similar positive views and opinions regarding not only the use of the IWB, but also their participation levels when an IWB was in use. Similar to the findings in the study conducted by Austin (2003), because the IWB can be used in a wide variety of ways, it can appeal to the different learning styles that are present in every classroom, which encourages involvement from all students.

Use of IWB Evokes Positive Outlooks in Both Students and Teachers

The results of the student survey also reinforced the positive impact an IWB had when used during content area lessons. Student responses on the survey revealed

an overwhelmingly positive outlook regarding IWB use. Of the four questions (2-5) that had interval responses, 88 percent of the responses exhibited a positive outlook (responses of either “I like it” or “Yes”) regarding IWB use. The other 12 percent of the responses demonstrated neutral feelings (responses of “It’s ok” or “Sometimes”). None of the students who participated in the study provided negative feelings (responses of “I don’t like it” or “No”) about IWB use. Student opinions reflect the positive impact that an IWB can have on participation and level of engagement during content area lessons.

The teachers I interviewed also expressed positive opinions regarding the use of an IWB and what it has to offer in a second grade classroom setting. Both teachers supported what the observations and surveys revealed – the IWB is a beneficial tool to have in a classroom, especially in terms of making lessons more engaging, which can lead to higher levels of student participation. Ms. Jones even stated that “I find myself being more excited to teach lessons that involve the SMARTBoard [IWB]! And from my own experiences, my own enthusiasm during a lesson can directly impact the effectiveness of the lesson and the engagement level of my students” (3 February 2011). Both teachers also agreed that the IWB is a versatile tool that can offer invaluable support and resources for everyone in the classroom (3 February 2011).

The positive student responses on the survey and observed student behaviors, in combination with teachers’ input from the interview, indicate the positive effects that an IWB can have. As a result, I believe that teachers should be incorporating this

tool as often as possible. Because of the wide range of student learning styles that are present in a classroom an IWB can be useful in targeting and incorporating a range of styles effectively into content area lessons.

Ongoing IWB Training is Beneficial

In addition, in order for teachers to effectively use the IWB they must also receive sufficient training. During the teacher interview, both teachers agreed that although they had each received the professional development courses offered through the school district, it didn't explore everything the IWB had to offer. The teachers admitted that although the courses were helpful, time to explore and experiment with the IWB and the associated software was also very valuable (3 February 2011). According to Morrow, Barnhart and Rooyakkers (2002), "Preservice and inservice professional development of teachers is probably the most overlooked yet essential component for integrating technology use with literacy instruction. Teacher training is essential to provide children with quality learning experiences involving technology" (p. 219). The training could come in a variety of forms, including professional development, observations of others using an IWB or having time to experiment and explore the features of the IWB and its software.

Recommendations for Future Research

Expanding Student Populations

In order to expand upon the findings and conclusions of this study, I recommend that future studies could be conducted using different student populations. A range of grade levels could be examined as well as a variety of classroom settings, including, but not limited to inclusive or integrated classrooms, special education classrooms or self-contained classrooms. This information could be helpful in determining the overall effectiveness of an IWB in an elementary classroom setting. Results of such studies have the potential to influence school districts personnel in their decisions regarding the installation of IWB in classrooms. Future studies could also examine if and how the length of students' attention span varies based on the use of an IWB.

Exploring Academic Benefits

In addition to determining the relationship between IWB use and student involvement and motivation, a study could be done to explore students' academic achievements related to IWB use. If academic gains are seen as a result of the use of an IWB, district administrators might be willing to increase the technology funds in order to make IWBs available to more students within a school.

Implications for My Work as a Teacher

According to Morrow, et. al. (2002), we, as teachers, must recognize the role technology plays in the workplace and train and prepare our children (students) appropriately. This study helps support the idea that the current generation of students is exposed to many forms of technology and because they are interested in and adept at using this technology, if, and when, it is used within a classroom setting the students is more likely to be engaged with the lesson. As a result, I believe that it is imperative that as a teacher I must not only stay current in regards to educational theories and methods for best-practice, but must also contend with the ever changing technology that will inevitably be present in school settings. Technology will continue to grow and advance and it is vital that people in the education field stay up to date on current trends. Keeping up with technological trends will help me ensure that my students continue to receive the best education possible through efficient and effective teaching practices which will more than likely involve a variety of technological tools.

Summary

As technology is quickly incorporating into seemingly every aspect of our lives it is becoming more and more essential for teachers to find efficient and effective ways to integrate technology into everyday lessons. The use of an IWB is one way to help accomplish this goal. If used correctly, the IWB can be a powerful teaching tool that can help to motivate and engage students during lessons. Ongoing training and professional development relating to the recent technological advances in

schools will enable teachers to incorporate the available technology in a way that is most beneficial for their students.

Appendix A: Observation Recording Sheet

Date: _____

Type of Lesson: ELA Math Theme

IWB Use: Yes No

Student	Type of Behavior			Additional Notes/Comments/Behaviors
	Participating	Watching	Distracted	
1				
2				
3				
4				
5				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

Appendix B: Student Survey

1. I learn best by...



Seeing



Hearing



Doing

2. How do you feel about the SMARTboard?



I don't like it



It's ok



I like it

3. Do you think the SMARTboard helps you learn better?



Yes



Sometimes



No

4. Do you think lessons that use the SMARTboard are more fun?



Yes



Sometimes



No

5. Do you think you participate more when the SMARTboard is being used?



Yes



Sometimes



No

6. When is your favorite time to use the SMARTboard?



ELA



Math



Theme

Appendix C: Teacher Interview Guide

Date: _____

Participants: _____

Teacher Interview Questions

- ☆ Please talk about how long you have used an Interactive White Board in your teaching.
- ☆ What training or professional development have you received in how to use the Board?
- ☆ What are some of the different ways students engage with the content of a lesson in which they or you use an IWB versus a lesson without the board? In other words, what is different?
- ☆ In your opinion, what are the benefits of using an Interactive White Board during your lessons?
- ☆ In your opinion, are there any drawbacks of using an Interactive White Board? If so, what?
- ☆ Can it be used effectively with all content areas? Why or why not?
- ☆ What advice do you have for teachers who are beginning to integrate this form of technology into their teaching?

Appendix D: Parent/Guardian Letter

November 2010

Dear Parent or Guardian,

I am a graduate student in the Department of Education and Human Development at The College at Brockport, SUNY. I am conducting a study regarding the use of an Interactive White Board (SMARTboard) in elementary classrooms. As part of my study, I will be observing in your child's second grade classroom during content area lessons.

If you grant consent for your child to participate in this study, I will observe him or her during English Language Arts, Math and Theme lessons. My observations will focus on student involvement and engagement during lessons.

I will be collecting data through the use of note taking. The collection of data will be approximately six weeks, and will involve 18 lessons. No information recorded will be assessed or graded by the classroom teacher.

The enclosed Guardian Consent form includes information about your child's rights as a project participant, including how I will protect his/her privacy. Please read the form carefully. If you are willing to allow your child's participation, please indicate your consent by signing the attached statement.

Thank you in advance for your consideration.

Sincerely,

Danielle Powers
Graduate Student, SUNY Brockport

Dr. Donald Halquist
Thesis Advisor, SUNY Brockport
dhalquis@brockport.edu
(585) 395-5550

Appendix E: Consent for Student Observations
CONSENT FOR OBSERVATION OF A STUDENT

Dear Parent/Guardian:

I am currently a graduate student at The College at Brockport, SUNY completing a master's thesis for the Department of Education and Human Development. As part of the requirements for the thesis, I am conducting a research study to explore how the use of an Interactive White Board influences second grade students' involvement and engagement during English Language Arts, Math and Theme lessons.

If you agree to have your child participate in the research study, I will observe your child during a variety of content area lessons over the course of six weeks

In order for your child to participate in this study, your informed consent is required. You are being asked to make a decision whether or not to allow me to observation your child. If you agree with the statements below, please sign your name in the space provided at the end. You may change your mind at any time and your child may leave the study without penalty, even after they study has begun.

I understand that:

- a. My child's participation is voluntary and he/she has the right to refuse to answer any questions.
- b. My child's confidentiality is guaranteed. His/her name will not be recorded in any observational notes. There will be no way to connect my child to the observation. If any publication results from this research, he/she will not be identified by name. Results will be given through the use of pseudonyms, so neither the participants nor the school can be identified.
- c. There are no anticipated personal risks or benefits because of participation in this project.
- d. My child's participation involves participating in regularly scheduled lessons in his/her second grade classroom and completing an anonymous survey regarding their opinions of the SMARTboard.
- e. The researcher will be observing my child's behaviors during 18 content area lessons over the course of six weeks. The researcher will be positioned in the classroom in such a way that all students are visible and will record observations on an observation sheet.
- f. The results will be used for the completion of a thesis paper by the primary researcher.
- g. Data from the observations will be kept in a locked filing cabinet by the researcher. Data and consent forms will be shredded when the research has been completed.

I understand the information provided in this form and agree to allow my child to participate as a participant in this study. I am 18 years of age or older. I have read and understand the above statements. All of my questions about my child's participation in this study have been answered to my satisfaction.

If you have any questions, you may contact:

Primary Researcher:
Danielle Powers
Graduate Student, The College at Brockport

Thesis Advisor:
Dr. Donald Halquist
Thesis Advisor, The College at Brockport
dhalquis@brockport.edu
(585) 395-5550

Signature of Parent/Guardian _____ Date: _____

Child's Name _____

Appendix F: Statement of Assent for Observations
Statement of Assent
To Be Read to Second Grade Students

My name is Danielle Powers. I am a student at The College at Brockport. I would like to observe you and your classmates during your some of your lessons to learn about your behavior during different kinds of lessons. You may see me writing in my notebook or looking at what you are doing during the lessons.

If you decide to let me find out about your behavior during different kinds of lessons, I won't write down your name or let anyone else know who you are. When I write about my study, I will only say what you and your classmates did during the lessons.

Your parent or guardian has given permission for you to take part in this study, but it is up to you to decide if you would like to participate. If you would like to take part in my study, but change your mind later on, you can tell your teacher or me that you have changed your mind. It is okay to change your mind at any time.

If it is okay with you for me to watch you during lessons, you can write your name on the first line below. Under your name you can write today's date which is

_____.

Thank you very much,

Danielle Powers

Name: _____

Date: _____

Signature of a witness 18 years of age or older

Date

Appendix G: Teacher Interview Consent

CONSENT FOR TEACHER INTERVIEW

The purpose of this research study is to explore the ways in which an Interactive White Board impacts student involvement and engagement during content area lessons. The researcher, Danielle Powers, will conduct an interview with teachers to gain their perspectives on the topic. The person conducting this research is a graduate student at SUNY Brockport. If you agree to participate in this research study, you will take part in the interview and will be asked about your perspectives and attitudes regarding the use of an Interactive White Board in an elementary classroom.

In order to participate in this study, your informed consent is required. You are being asked to make a decision whether or not to participate in the project. If you want to participate in the project, and agree with the statements below, please sign your name in the space provided at the end. You may change your mind at any time and leave the study without penalty, even after the study has begun.

I understand that:

1. My participation is voluntary and I have the right to refuse to answer any questions.
2. My name will not be recorded. If any publication results from this research, I would not be identified by name.
3. My participation involves answering 4 questions in regards to Interactive White Board use in an elementary classroom setting.
4. Time is a minor risk. My participation will be no more than 45 minutes.
5. All data, including the interview, will be kept in a locked filing cabinet by the researcher. Data and consent forms will be destroyed by shredding when the research has been accepted and approved.

I am 18 years of age or older. I have read and understand the above statements. All of my questions about my participation in this study have been answered to my satisfaction. I agree to participate in the study realizing I may withdraw without penalty at any time during the survey process.

If you have any questions, you may contact:

Primary Researcher:

Danielle Powers

Graduate Student, SUNY Brockport

Thesis Advisor:

Dr. Donald Halquist

Thesis Advisor, SUNY Brockport

dhalquis@brockport.edu

(585) 395-5550

Signature of Participant _____ Date: _____

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