The use of SMART Boards for
Smarter Teaching and Smarter Learning

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"We often think of the learning process as a mosaic: lots of tiny pieces finally come together to form a picture. Learners are often scrabbling around, with their noses so close to the grindstone, trying to shape the fragments they have so that they can fit together – somewhere – that they take a long time before the picture falls into place. If it does. An IWB (interactive whiteboard) enables the teacher and learners to locate each fragment – the learning object – and show how it fits in the big picture" (*How do interactive,* n.d., p. 2).

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Context

What happens to struggling learners with attention problems when I incorporate the use of a SMART Board interactive whiteboard in my teaching?

Even though I am a third year teacher and have many aspects of my teaching that I would like to explore and improve upon, I have always found the integration of teaching and technology fascinating. As luck would have it, I was placed in a first grade classroom across the hall from the Computer Technology teacher during my first year. Not only was she a wonderful person with helpful ideas and suggestions (and previously a first grade teacher), she also showed me the "latest and greatest" in the technology world. Last year, our school purchased a SMART Board™ to be shared among all of the teachers in the school. A SMART Board is an interactive whiteboard, that, when used with a computer and a projector, enables students to interact with the material presented in ways that would otherwise be impossible. After using the SMART Board for just one week in my classroom, I began researching various grants and other avenues to obtain additional units for our elementary school.

I am currently teaching first grade in a class consisting of 19 students. Presently, I only have one classified student. There are ten boys and nine girls in my classroom. At the beginning of the school year, my students were considered exceptionally low, as over half my class fell below the average reading level for first graders in September. The remainder of the students were reading at a first grade level. At this point in time, all of my students are reading at or above grade level, except those that are currently receiving basic skills instruction. Additionally, I have several students with extremely low self-confidence, as well as several others with severe attention and distractibility issues. All in all, however, my students get along well with each other and thrive when given positive praise.

This school year, a SMART Board and projector have been installed in the computer lab and my school has purchased three "traveling" SMART Boards, one for each grade level. Since I attended the two training sessions offered by our computer teacher and previously used the SMART Board in my classroom, I was given the responsibility of and opportunity to "house" the interactive whiteboard for first grade this year. I set up a sign-out schedule for the board and have offered to assist members of the first grade team in finding easy and appropriate ways of using the technology in their classrooms.

At the beginning of this school year, I was excited to use the SMART Board with the students in my class. I figured that I would be able to catch students' attention and motivate them to learn using this new technology. The use of interactive technology relates to the educational goals of the community and school district because we are continuously trying to find better and more innovative ways to teach our students. When students are involved in every second of the lesson, they know that their response is important and are excited to come up and interact with the SMART Board (write a response, move correct coins, circle nouns, etc.). Even before meeting my students, I knew that the use of a SMART Board would benefit each of the students in the class because this teaching tool appeals to kinesthetic, visual and auditory learners, as well as learners with special needs. Although appealing to these multiple intelligences is not ignored in the general curriculum at the first grade level, a SMART Board enables teachers to incorporate these multiple intelligences into their lessons effortlessly.

Finding ways to reach all of the students is always important but was especially crucial this year with the diversity in learning styles, distractibility issues and self-confidence troubles in my classroom. I did not use the SMART Board during the first two weeks of school because we were still learning and reviewing routines, basic letters and sounds. This, however, was a huge

mistake! I should have been using this technology from day one, as the first time I incorporated it into our day, students were much more engaged in the lessons. The more attentive they are, the more they will learn. When using a SMART Board during my lessons on any topic, I see students that are eager to be personally involved in the lesson. That excitement clearly transfers to enthusiasm about the material presented and seems to ripple through the classroom.

Because students are growing up in a world filled with technology, it is important to change our teaching methods to include technology-based instruction. Many children spend hours each week in front of the television, playing video games, or playing on the computer. When they come to school and are asked to listen to their teacher read a story or complete a worksheet every single day, I feel the concepts will not be retained as much as they would be if we incorporated technology, especially technology they could interact with and touch. Technology is their world – we need to instruct them in the most effective way possible. SMART Boards are avenues that make learning come alive for all students! I am excited to explore the effects of this technology on two struggling students who are highly distractible and have difficulty sustaining attention during instruction.

Even though I will specifically be focusing on the effects of SMART Board based instruction on two specific students, I will also be looking at the class as a whole to help gain some background information to generalize for all students. I will specifically observe the behaviors and actions of one boy, "Alex", and one girl, "Erin" in my class in response to the SMART Board (all names have been changed). Both students are experiencing a great deal of difficulty completing class assignments. Alex's and Erin's reading levels (as obtained by the Developmental Reading Assessment <DRA>) are slightly below grade level. Scores on recent reading and math assessments have also shown areas in need of improvement.

I chose these two students because every class in every school district has students that fit this description. I want to find a way to reach these students and motivate them to learn and succeed. In my three years of teaching, the academically low students who had difficulty paying attention were the students who kept me up at night thinking, "How can I reach this student?" or "Will he ever just sit still and raise his hand?"

At the start of the school year, I asked parents to fill out an interest survey and write a letter about their child explaining whatever they would like me to know. Alex's parents stated: "He is quite a character and loves to make people laugh. Alex likes to watch people and learn to do things on his own. He needs to feel in control and gets frustrated easily." On the interest survey, his parents checked off that he approaches learning with excitement or without interest (depending on the situation). In Erin's parents' letter, they stated: "Erin is full of life and energy. She is nosey and loves to talk. She tends to follow other kids rather than do her own thing. You will enjoy her in your class as long as we can keep her quiet." Her parents expressed that she approaches learning with reluctance and anxiety. Additionally, one of their goals for the year was to get Erin to focus on her work.

First grade is an extremely significant time period in a child's educational career. It is during first grade that most children will learn the basic skills that they will need for further educational success. Reading is the most important skill necessary for future learning, and I am responsible for helping every student that enters my class not only to become a reader, but also to enjoy reading. This year, our school has adopted a new reading program and all teachers have a mandatory 110 minute Reading and Language Arts block daily, as well as five 50 minute Writing blocks per week. The expectations of the new program, as well as reading levels for end-of-year first graders, are extremely high. Every school day must have time blocked in for

Reading, Writing, Language Arts, Math, Lunch/Recess, and Specials (art, music, computers, etc.). Because of this, it is sometimes difficult to fit in Science, Social Studies, Handwriting, and activities to further social interaction. Since first graders' days and the curriculum are so demanding, it is extremely important to find ways to connect with the students and make learning fun. Therefore, I will be researching and exploring the effectiveness of using a SMART Board interactive whiteboard with all of my students, but specifically looking at those with low reading levels and difficulty sustaining attention on tasks or lessons.

<u>Literature Review</u>

SMART Boards are one of the many different interactive whiteboards available for educational and business purposes. The SMART Board is a touch-sensitive whiteboard that is connected to a computer and a projector. Lessons or presentations are made on computer programs and then the projector displays the image onto the whiteboard. The computer is then controlled by either using your finger to open or close programs and move objects, or by electronic pens to write words. SMART Boards are powerful learning tools as they enable teachers to instruct using the latest technology, with access to the internet, videos, and educational software (Fernandez & Luftglass, 2003). This empowers students to learn and explore new concepts with technology to create a more dynamic learning experience. The powerful learning experience is one for both my students and me. Each time I create a lesson and present it to my students, I am learning about the effects of integrating technology in my classroom.

SMART Boards have recently become very popular in educational settings across the United States. However, more than "75% of classrooms in the United Kingdom have adopted the multimedia technology" (Moorhouse, 2007, p. B2). School districts, principals and educators are now seeing the importance of this technology in the learning process as it enables students to explore concepts in ways that were not previously possible. As more schools are becoming equipped with interactive whiteboards, "there is a real need for teachers to play an active role in specifying the ways in which this extremely powerful tool is installed and used" (Promethean Technologies, n.d., p 2). It is for this reason, among others, that I have decided to not only research the effectiveness of interactive whiteboards, but also pursue educational grants to obtain additional boards and projectors for the teaching professionals in my school.

Although all teachers are faced with challenges, the challenges at an elementary school level differ from those at a high school level. In order to optimize student learning, elementary school teachers must take all the unbounded energy within the children and focus it on learning. I feel that as a teacher, I present enthusiastic lessons, but some topics are more difficult than others to instill a hunger to want more in the children. Using the SMART Board, I can easily engage children in the lessons and, at the same time, create a sense of excitement throughout the class.

With the introduction of the SMART Board in the mid-nineties, SMART Technologies has seen positive learning experiences in elementary school children around the world. Because of the high energy level of the students, they actually became excited about learning when they were taught with a SMART Board incorporated into the lesson. Other interactive whiteboard companies, such as Promethean, have found similar results (Promethean Technologies, n.d.). Elementary school teachers, in conjunction with SMART Technologies, have found that the interactive whiteboard motivates and engages students in the material being presented and thus have found the "perfect match between the way the board worked and the needs of their students" (Knowlton, 2006, p. 1). For most of my students, I, too, have found this "perfect match". The students absolutely love using the SMART Board. Students of all learning types have responded in positive ways when the interactive whiteboard was incorporated into my teaching.

This generation of young learners has grown up inundated with auditory and visual information through video and computer games, the Internet, and television. This is very true of my students this year, as they were all excited about the new Nintendo DS, Playstation 3, Xbox, or Nintendo Wii that they got for their birthday or a holiday. My students also jump at the chance to "play" on the computer during free time. Since this is what students have been exposed to

prior to any educational experiences, it quickly becomes many students' preferred style of learning. Thus, this "perfect match" is created. In the past, students grew up with stay-at-home mothers and/or went to a preschool where they were read to. Technology was not a part of their daily life. Since technology was not a part of their early learning experiences, it was not as important to incorporate technology in their later learning experiences. Cathy McDonald, a school-based technology specialist states, "Kids learn better and retain what they've learned when their lessons are rich with visual images and graphic organizers. Instead of just receiving information in a lecture format, our kids are actively engaged in constructing their own knowledge" (SMART Technologies, 2006, p. 1).

When students construct their own knowledge, they are mastering more advanced thinking skills. By incorporating the use of a SMART Board, students are sharing, modeling and demonstrating what they have learned and, consequently, playing the role of a teacher. In my classroom, kids love to move an object or write on the SMART Board and eagerly await their turn to become the "teacher" in front of the room. One teacher who utilizes the SMART Board to create a "student-centered classroom" explains that the SMART Board "fosters an environment that allows students to go beyond the surface and dig deeper into a concept" (SMART Technologies, 2007, p. 1). Students in her classroom, like most classrooms, have varying ability levels. However, this teacher states that the SMART Board "not only fosters critical thinking in these students, but also cultivates differentiated learning" (SMART Technologies, 2007, p. 1).

SMART Boards have been shown to be especially helpful with all students, specifically those with special needs or motor skill deficiencies. Many younger children have not yet developed all the fine motor skills necessary to operate a mouse. When using the SMART Board, a student's finger becomes the "mouse" and he or she can move or touch anywhere on the screen

with ease. Additionally, it has been proven that students with autism also benefit from the use of the interactive whiteboard as "they are more willing to collaborate, and it has made the communication process easier" (Vanderleer, 2007, p. 17). All students benefit from the use of interactive whiteboards as studies have shown that the use of an interactive whiteboard in educational settings parallels attributes of many different learning theories, such as "Constructivism, Behaviorism, Piaget's Developmental Theory, Brain-Based Learning, Multiple Intelligences and Learning Styles" (*How do interactive whiteboards*, n.d., p. 3). Throughout the past two years, I have seen positive effects on all types of learning styles and personalities. I was even able to actively engage a student with Selective Mutism when using the SMART Board.

It has also been noted that students with attention difficulties or behavior problems also benefit from the use of this technology in the classroom. As one teacher noted,

> It helps them because they like the look of it. Visually it's useful. It's useful for kids like that boy who did very well this morning, whose behaviour is much better today doing that…at least he's started to think about text and when he went back to doing his own editing he was using some of those techniques (Armstrong, Barnes, Sutherland, Curran, Mills, &Thompson, 2005, p. 467).

The students in my room love to play games. Therefore, when the rather difficult topic of plural nouns is turned into a visually stimulating game using technology, I usually catch the attention of a majority of the students in the room.

Teachers are not the only ones who see the benefits of using interactive whiteboards in the classroom. In a study by Hall and Higgins (2005), investigators explored students' attitudes toward whiteboards in the classroom. One student acknowledged the resourcefulness of an interactive whiteboard when he said, "Everything is accurate, like the shapes and everything. Before you had to get a ruler and draw it and you can't get it exactly accurate" (Hall & Higgins, 2005, p. 106). Recently, my students seemed irritated when I drew a ruler on the regular

whiteboard because the numbers were not precise and the lines were not completely straight. Because the SMART Board was not in my classroom at the time, I was unable to use technology to offer my students a perfect representation of the ruler. Additionally, holding objects up to my hand-drawn ruler would have been much more fun if we were able to complete the same introductory lesson using the SMART Board. Interestingly enough, I believe my students felt the same way about the lesson presentation and would have preferred to learn about measurement using the SMART Board.

Other students seemed to enjoy the capabilities of the technology in relation to using their senses (colors, movement, audio, etc.). One student explained, "On that (plain whiteboard) it's really boring, you feel like you're going to go to sleep. But on that one (interactive whiteboard) you're like still awake and I'm interested" (Hall & Higgins, 2005, p. 106). Another student explained, "There's even like games and it moves about on the screen but that (plain whiteboard) is just like stationary. When you draw a picture it's like fixed and when you're on that (interactive whiteboard) it goes all over the place" (Hall & Higgins, 2005, p. 107). When the interviewer asked this student if that made learning more exciting, the student loudly and enthusiastically exclaimed, "Yeah!"

Additionally, when using interactive whiteboard technology, many students actually think that they are just playing games. All of the students that were interviewed explained that the use of the interactive whiteboard during lessons made them more enjoyable. One boy further justified his reasoning for the interactive whiteboard making lessons fun by saying, "We are doing a science topic on plants and what (Teacher) does is she prepares a PowerPoint presentation and you go through it and it's kind of like having fun and learning at the same time. It's really exciting and it's just brilliant" (Hall & Higgins, 2005, p. 107). Advocates of interactive

whiteboards in classrooms explain that they provide a large visual environment that is colorful and provides for active learning with interactive options. Additionally, lessons can be recorded and captured to be followed up with later or viewed by a student who was absent (*For and against – IWB's*, 2007). Although I have not used this feature, I see the importance of this for high school and college age students who miss a class or a day of school. Because my students are so young, I feel it would be difficult to expect them to watch our lesson and learn as if they were a part of the class that day. This, however, is an element of the SMART Board software that I am looking forward to trying in the future.

Even though educators, researchers, and students mostly see positive and beneficial reasons for incorporating interactive whiteboards into classrooms, there are some obvious issues with the technology. Otherwise, every classroom would have a SMART Board. One of the more difficult aspects of incorporating this technology into classrooms is the cost. Each classroom needs a computer, a projector, and a SMART Board. Computers range in price from $800-$2,000, projectors range from $800-$1,500, and a 77" SMART Board with floor stand is about $1,700, leaving the cost per classroom anywhere between $3,300 and $5,200. Other challenges include "dealing with space issues involved in setting up the equipment in elementary classrooms, access to electrical connections, and the need for teachers to take the time and training needed to develop comfort with the equipment" (Fernandez & Luftglass, 2003, p. 63).

Time and fear of the unknown were two reasons that I did not use the interactive whiteboard during my first year of teaching. I believe that many teachers also feel the same way. Speaking from personal experience, I believe that once the equipment is in your classroom and you begin to use it more and more, you will not want to send it on to another colleague – and neither will your students! Schools need to incorporate the cost of training programs, continuing

professional development and technical support for teaching staff when taking on the task of

implementing this technology in the curriculum (Hall & Higgins, 2005).

Oftentimes it is more important to look at how the technology is used in the classroom

rather than how much money a district spends on the technology. Obviously, if the technology is

not used correctly or to its potential, it is not worth it. Rivero (2006) explains that in order to

teach successfully with technology,

> teachers have to be prepared by understanding the hardware and software they use.
> Everyone's looking for the magic tool…Most schools bite off many more of these than
> they can chew. Even if the tool *is* valuable, its value is never fully achieved. It's better to
> have five tools that we really know how to use well, rather than 25 tools we don't (p. 45-
> 46).

This is probably one of the reasons that my district has not begun purchasing and installing that

many interactive whiteboards throughout our schools. As long as we continue training additional

staff members and have teachers that will effectively and consistently use the technology in their

classrooms, we should continue to get a few more whiteboards and projectors each year.

As much as students enjoy having them in the classrooms, problems are seen through

their eyes as well. The biggest problems students noted in interviews about interactive

whiteboards were technical issues (Hall & Higgins, 2005). For example, one student explained

his opinion regarding the computer portion of this technology: "And sometimes like if it freezes

and you're trying to do some work on it and you're trying to find a new page, you can't you just

have to wait. The teacher just writes it on the plain whiteboard" (Hall & Higgins, 2005, p. 108).

Another issue that caused frustration for students was the need to recalibrate the board. One

student explained the process as follows: "I don't like it because you have to orient it and if you

don't get it exactly right and then if you write something on it, say you wrote it here (indicates on

interactive whiteboard), normally it comes somewhere down there and you can't underline things

to look like something else" (Hall & Higgins, 2005, p. 108). If the board has not been oriented or if the board or projector is moved (if it is a "traveling" board rather than mounted on the wall or ceiling), text can appear fuzzy and writing can appear on different areas of the board, making it extremely difficult to interact with the technology, especially for students. However, after continuously using the technology in my classroom, I have not found either of these issues to happen that often. These problems, when they do occur, might stick out in a student's mind because it may force the teacher to use a different teaching tool for instruction in place of the SMART Board.

Another issue students identified as a problem was teacher and student skills when working with the interactive whiteboard. A conversation as noted in a study by Hall and Higgins (2005) between students on the issue is presented below:

> B: Everyone's really quite used to the whiteboard but we've got this teacher and well she's kind of new to the whiteboards cos (sic: because) she's a new teacher and I think she's still catching on to using the whiteboards and so are two other teachers.
> G: It can get a bit annoying when she can't remember how to work it.
> B: Because sometimes it's a bit dodgy (sic: uncertain). It doesn't work sometimes and she has to calibrate it.
> G: And sometimes the pen doesn't work on it and she (teacher) starts banging it against the wall and saying work and stuff.
> G: And she's stamping it on the floor to make a big bang.
> B: It wastes lessons (p. 109).

Since students see issues when proper training is not given, it is important for teachers to be confident and "in a position to use them effectively both in technical terms, i.e. how to turn it on, where to find files and software, and pedagogically, i.e. integrating it effectively, purposely and meaningfully into lessons" (Hall & Higgins, 2005, p. 109). If teachers do not have the training or confidence, then the effectiveness and potential uses of the technology diminishes. However, it is also important that teachers *attempt* to use the technology in their classrooms. I have found that

with continued use and practice, I have gotten better and gained more confidence in navigating and creating lessons using the SMART Board.

One other problem students noted is that only one student can interact with the whiteboard at any given time. Depending on what that student is doing, other students can lose interest in the lesson. This is my biggest problem with the incorporation of the SMART Board in my classroom. With a class of 19 students, a student may only get to interact with the board one or two times during a lesson. SMART Technologies, as well as a few other manufacturers of interactive whiteboards, have made some additional components to enable all students to participate. For example, SMART Technologies recently introduced the Senteo Interactive Response System, which would give each student in the class a remote control to answer questions in a variety of formats (multiple choice, true or false, or numeric responses). Feedback using this remote system is amazing. Students get immediate feedback on their individual screen indicating whether or not their choice was correct, and the program will create a graph so the teacher knows how many students answered the question correctly prior to moving on. Additionally, all answers are stored and can be downloaded into an Excel spreadsheet for use in calculating grades and/or assessments.

One aspect of the remote technology which is wonderful is the personalized attention it can give to shy or struggling students. With the push of a button, a student can ask for help anonymously. The teacher is then given an opportunity to explain the information in a different way prior to moving on. Additionally, teachers can use the responses given during any lesson to create personalized study guides based on individual student answers. Because this is a new aspect of SMART's products this year, studies have not yet been done to explore the effectiveness of this tool. As wonderful as it sounds, we all know there is one major

drawback…money. Twenty-four remotes and the Senteo Receiver would add an additional $2,300 to the cost of implementing this technology in one classroom. I am curious as to how well younger students (like my first graders) would be able to answer questions using the remote system.

Although interactive whiteboards indicate positive effects on student learning, a myriad of negatives prohibits many districts from equipping all classrooms with the technology. Schools that have this technology need to ascertain that their teachers are properly trained on the equipment and perhaps have grade level or departmental meetings to share how each teacher is using the technology. It seems as though the incorporation of interactive whiteboards in American schools, despite the negatives, is still a work in progress. The technology, however, can "effect a profound change in the ways in which our students learn, the ways in which we teach and, more fundamentally, the ways in which we organize the curriculum and our schools" (Promethean Technologies, n.d., p. 2). With the knowledge that I gain from my research, I hope to help promote the integration of interactive whiteboard technology in the educational system.

Methodology

In order to best research how the use of the SMART Board affects students in my first grade classroom, I needed to explore a variety of sources. Observations of students' behaviors and reflections of my teaching experiences on a daily basis were two extremely important aspects of my research. Because the frequency of and the ways in which one incorporates technology into the curriculum probably differs between teachers utilizing this technology, a good portion of my research was extremely reflective. This enabled me to explore the best ways to include technology in the first grade curriculum to benefit not only the students' learning experiences but also my own.

To start, I read many articles about the use of interactive whiteboards in classrooms. Many publications gave insightful information about student and teacher reactions and opinions. These bits of information were helpful. They really forced me to think about my own experiences with the SMART Board and what to look for when journaling about the day or making observation notes about student behavior during a lesson. Reading about various schools and their technology programs was also helpful. It enabled me to assess where my school district fell in terms of technology use. Additionally, I realized that no matter what I read, I had to find what worked best for me and my students.

Journaling was a very large part of my data collection. During the time period of data collection (and before and after), I wrote in my journal about the day's events. I made comparisons of student understanding or attention level during regular (non-SMART Board) lessons versus lessons taught using the SMART Board. Additionally, my basic skills aide graciously agreed to complete student observation sheets during a variety of lessons. Although she did not complete as many observation sheets as I had hoped for, the observations notes on

the lessons were extremely informative. It was difficult for her to complete more observation sheets because her job in my room is to assist the basic skills students, and I did not want to take that extra support away from them.

Additionally, I interviewed two other teachers within the building about their use of the SMART Board in their classrooms. This allowed me to make comparisons to my use of the technology and converse about their likes and dislikes when using the SMART Board. We also discussed how often they used the board and the areas in which they used it most often. This was an integral part of my research as it made it possible for me to see how other teachers in my building felt about SMART Boards and their views about the effects on the students in their classrooms.

I also used student surveys because I believe it is also important to include student perspectives on this issue since it is a brand new learning tool. The student surveys (SMART Board Survey - See Appendix C) anonymously asked students how they preferred to learn in various subjects. Student writing samples were assigned where students were asked to write their opinions about whether or not every classroom should have a SMART Board.

Because one of the biggest difficulties of incorporating this technology into a classroom or school district is cost, I visited an outside district where every elementary classroom had an interactive whiteboard and a projector. Interviews were conducted with the principal and the technology teacher to see how funding was provided for this project as well as how teachers in the building were trained and how they utilized the technology.

Once the data collection portion of my research was complete, I began to code each aspect of my data, looking for similarities, differences and themes along the way. I had quite a lot of information to go through, so I began to piece through each stack of data carefully.

Thankfully, once data collection was "complete", another first grade teacher asked to borrow the SMART Board, so I knew that even though I *could* add more to my already large volume of data, I probably would not be adding too much more. It was interesting to read through all the data and explore the codes for similarities and patterns. I especially found it helpful to note all of the similarities throughout my journal entries in response to student participation/involvement.

<u>Findings and Implications</u>

Through coding and data analysis, I investigated the various paths my data explored during the entire teacher research process. Throughout the course of my research, I was exploring how the use of an interactive whiteboard would affect my teaching, and consequently, my students' learning. Much of the relevant literature on interactive whiteboards in the classroom explores the positive aspects of this technology on students' academic progress. Although the use of this technology has its negatives (cost, technological issues), my research seemed to support the fact that the positives far outweigh the negatives in terms of providing enriching and exciting educational experiences.

Comparisons of student behaviors were noted during various lessons when teaching with the SMART Board and instructing without it. In November, I presented a reading lesson which focused on comprehension strategies about <u>The Little Red Hen</u> without using the SMART Board. On the student observation sheet, my aide noted that I asked the class 14 questions throughout the story. These questions ranged in difficulty and comprehension skill (predicting, retelling, etc.). Erin, a struggling student in my class raised her hand to answer five of the questions posed to the class (35%). However, two times she wanted to participate were in response to prediction questions, in which she looked ahead in the story prior to raising her hand. Alex had a much more difficult time with this lesson. He only raised his hand to answer three of the questions (21%). While reading and discussing the story, my aide noted that Alex was "playing with his pencil, looking in his desk, not following along, tapping his pencil, talking out, always in motion, had his fingers in his mouth and was standing up the majority of the time" (Student Observation Sheet - November 13, 2007).

After teaching this lesson, I found it important to note my observations by writing in my journal. While discussing four of my struggling students (two of them being Alex and Erin), I noted their particular behaviors during this lesson.

Tuesday, November 13, 2007
During the reading of the story, these four kids were never "with" us…whether it was being on the correct page or simply even looking like they were paying attention. Alex was drumming on his desk. Melissa was playing with her hair. Greg was staring at the front board. Erin was flipping through her story constantly. These four kids had a great deal of difficulty staying with us and choral reading the page with us…even though it is a fairly easy text to read. Was it because they had already heard a story like this before so it wasn't new and interesting to them? I need to find ways to motivate them when reading out of our books together (Teacher Journal).

Looking back, I think this experience was a great one to begin my "data collection" period. I had just taught a lesson without providing enough stimulation and excitement and my frustration was evident. The students described above, as well as the rest of the class, needed a more exciting way of learning this material. Although I cannot go back and measure whether or not the use of the SMART Board would have helped with this particular lesson, I believe an interactive way to respond to comprehension questions would have been a more effective way to gauge the comprehension of all students in my class.

Although Alex and Erin can both be considered "struggling learners with attention problems", my journals and observation notes indicated that they were two completely different types of learners. Alex seems to respond really well when we use the SMART Board in any subject. He enjoys hands-on activities but gets aggravated when he cannot build or complete a project exactly how he wants. During a Thanksgiving craft, "Alex got frustrated when things did not go his way (if his headband was not staying glued in place on his Indian). A parent volunteer sat down to work with him and that seemed to frustrate him even more" (Teacher Journal -

November 19, 2007). Despite the frustrations portrayed in this activity, it really is amazing to watch Alex complete hands-on activities because he is generally quite calm and focused.

Alex exhibits some of the same behaviors when using the SMART Board. For example, when using the SMART Board to teach a lesson about plural nouns, Alex raised his hand to answer (move the item on the board, or circle/underline the correct response) 12 out of 17 times (71%). On the Student Observation Sheet, it was noted that Alex's "hand was always up" and that he responded with a big smile when I said, "Good answer!" (Student Observation Sheet – November 16, 2007). During a lesson about nouns presented on the SMART Board, Alex's hand was once again "always raised". Even though it was noted that he was standing up, jumping around and waving his hands during the lesson, the observation notes stated that he was "clearly excited about the lesson" (Student Observation Sheet – December 18, 2007). He raised his hand to participate 65% of the time.

I believe that Alex's excitement over the use of the SMART Board stems from his need to be constantly moving. Although he does not seem to care about whether he has the correct answer or not, he wants to participate and answer questions. The SMART Board gives him a chance to get up and move around in order to answer the question. Although all first graders would prefer shorter lessons and cannot be expected to sit for long periods of time, many students with characteristics of Attention Deficit-Hyperactivity Disorder (ADHD) or Attention Deficit Disorder (ADD) find it impossible to sit for even short periods of time. I feel the use of the SMART Board allows these children to move throughout the lesson while still holding their attention.

Erin learns in a completely different way than Alex. She is very needy and requires constant adult contact. She was recently diagnosed by her family pediatrician as having anxiety
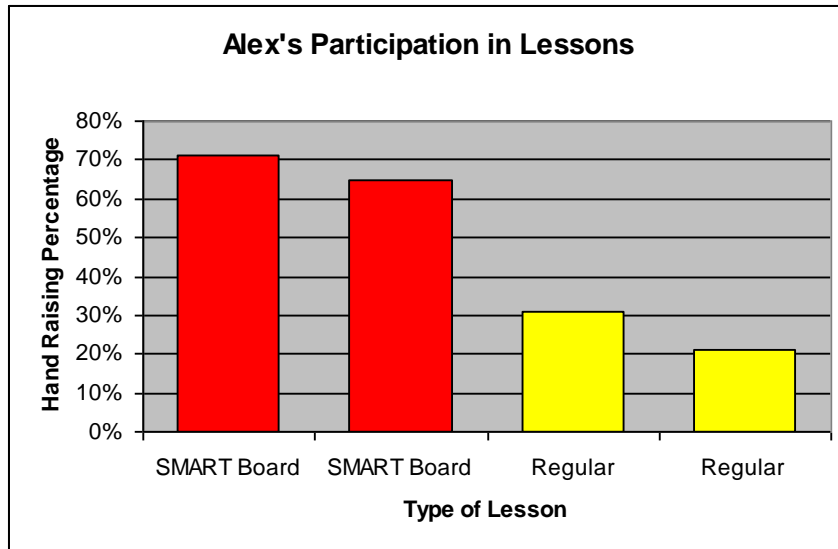
and low-self esteem. During a lesson about plural nouns that incorporated the use of the SMART

Board, Erin raised her hand to participate 41% of the time (Student Observation Sheet –

November 16, 2007). However, it was noted that she needed a lot of motivation to participate,

and, even after getting called on, was reluctant to write the correct ending of the noun on the

board.

In a different lesson using the SMART Board, Erin exhibited some similar behaviors. She

was "laying on her desk" and "unfocused" (Student Observation Sheet – December 18, 2007).

She needed many prompts from the teacher throughout the lesson. Erin raised her hand to

participate 10 out of 34 times (29%). When the students moved to the rug for the remainder of

the lesson, Erin could be found sitting very close to the projector cart, almost as if she was hiding
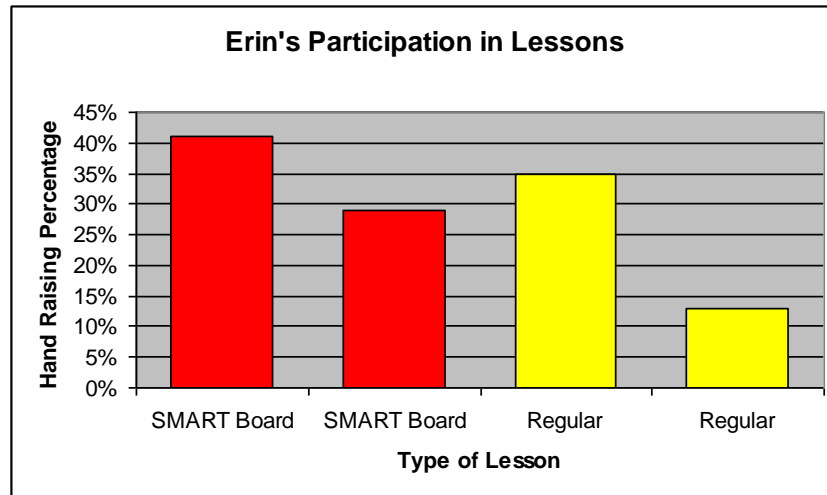
behind it to avoid being called upon.

In looking at some of Erin's behaviors during SMART Board lessons and regular lessons,

I believe her self-esteem and anxiety issues are more apparent when the SMART Board is used.

Although Erin does not participate 100% of the time in either circumstance, she seems more

reluctant and needs quite a bit more prompting when the SMART Board is involved. Erin

explained that she enjoys learning through the use of a SMART Board, but I do not think that

this technology is as effective on her learning style as it seemed to be for Alex's learning style.

Additionally, this research forced me to criticize my teaching habits as well. After exploring

Erin's behaviors, I know only to call on Erin when her hand is raised in order to make sure she

has the confidence to get up in front of the class to answer a question on the SMART Board.

I was amazed at the differences in participation between SMART Board lessons and non-

SMART Board lessons. I found it incredibly helpful to look at the differences within each

student as well as between Alex and Erin (as noted in the Student Observation Sheets). Graphs

can be found below that visually depict the differences in participation levels between types of lessons as well as the differences between the two students.

Alex's Participation in Lessons

Hand Raising Percentage vs. Type of Lesson. SMART Board: ~71%, SMART Board: ~65%, Regular: ~31%, Regular: ~21%.
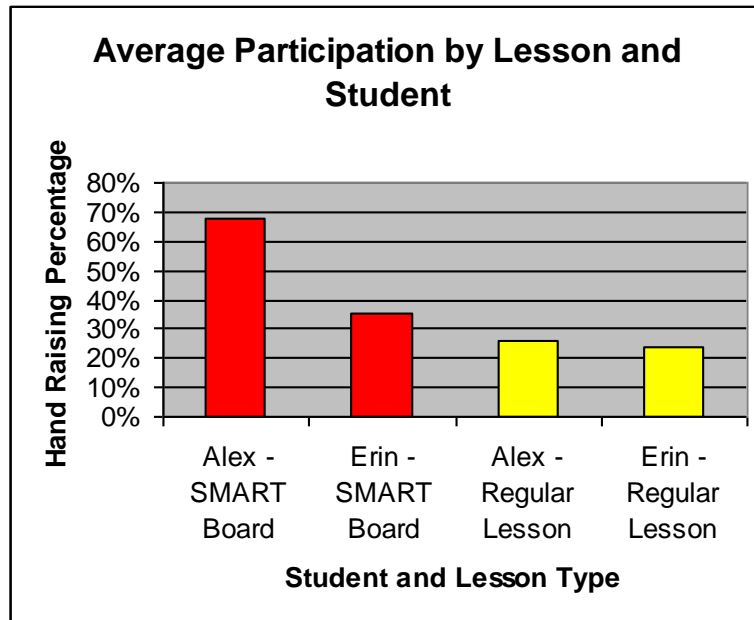
Alex, a first grader with low academic scores and various attributes of Attention Deficit-Hyperactivity Disorder, clearly participates much more frequently during SMART Board lessons as compared with regular lessons.

Erin's Participation in Lessons

Hand Raising Percentage vs. Type of Lesson. SMART Board: ~41%, SMART Board: ~29%, Regular: ~35%, Regular: ~13%.

Erin participated at a slightly higher percentage (average) when the SMART Board was used, but the difference between the two types of lessons was minute. I believe this showed that

although Erin did enjoy learning with the SMART Board, it did not make a difference how the

material was presented.

Average Participation by Lesson and Student

A bar chart titled "Average Participation by Lesson and Student" with the y-axis labeled "Hand Raising Percentage" ranging from 0% to 80%, and x-axis labeled "Student and Lesson Type". The bars show: Alex - SMART Board (~68%, red), Erin - SMART Board (~35%, red), Alex - Regular Lesson (~25%, yellow), Erin - Regular Lesson (~23%, yellow).

When comparing the two struggling students, it was important to see the decline in

participation based on the method of instruction used and the student being examined. An

average of the various lessons was computed for each type of lesson and each student. A very

high participation percentage was noted for Alex during the SMART Board lessons. Although

Erin's average participation percentage was much lower than Alex's, it was still higher than

either student's participation during regular lessons. I believe that this comparison shows

educators that the SMART Board is a valuable educational tool for students. Although some

types of students may benefit more than others, the SMART Board has become an effective

teaching tool for all students in my classroom.

The use of the SMART Board throughout the year has really improved my teaching and

helped increase the motivation of the students. Because we have a new and intense reading

program this year, using the SMART Board gave me some added confidence in teaching some

things that I had never taught before. In November, first grade teachers were supposed to have

their students write a report about an animal – an idea that would have never been approached

until the spring in first grade. In a few journal entries listed below, I list my fears, anxieties and

approaches regarding this problem.

Monday, November 26, 2007
How am I supposed to have 19 kids write about 19 different animals when they can't even read on their own in order to research them? It surely feels like a situation that may give me a million headaches this week. I figured I could always skip it and no one would ever know. Anyway, despite my fear of the unknown, I started the report writing process today. I had the students name a whole bunch of animals that they could see at the zoo. I wrote the animal names on my whiteboard easel while the kids were on the rug and we talked about the different animals. After lunch, we had our writing block. We all returned to the rug where we could see the whiteboard easel and the SMART Board. I had four screens on the SMART Board with different animal environments (ocean, forest, desert, and grassy plain). We took the animals listed on the whiteboard and wrote their names in their natural habitat. The only environment that had just one animal was the forest…and it was a bald eagle. We decided that we would use the bald eagle for our project. I wrote "Bald Eagle" in a center circle on our forest background. Then, as a class, all of the students contributed ideas about the bald eagle to add to our web of information on the SMART Board. When we ran out of information, I opened up an internet webpage that just let them see the bald eagle to get some more ideas flowing. All of the students seemed extremely engaged in the lesson today and I was really excited! All in all, today's beginning lesson on writing a report went well…but I'm still skeptical about them writing on their own (Teacher Journal).

Tuesday, November 27, 2007
During our writing block, we went back to our bald eagle report. I pulled our web and main idea sentence back up on the SMART Board. Together, we developed three detail sentences to support our main idea sentence. I typed these in three different colors and the children copied them onto their paper under the main idea sentence. They worked so quietly during this! Even John, who is usually out of the room during writing or has individual support, worked hard on his portion of the report! (Teacher Journal).

After having students complete a web to organize their individual animal reports (just as

we did as a group), the students followed the same steps we had when we wrote the report about

the bald eagle together. Students created their own web where they listed all the information they

already knew about an animal of their choice. Then they met with a partner who gave them

additional ideas. We even had a "self-proclaimed animal expert" (one of the children) go around

to each of his peers in the class and tell them one or two facts about the animal that that student

had chosen. I corrected the spelling on each of the students' webs and the students came up with

a generic main idea sentence for everyone to use.

> **Thursday, November 29, 2007**
> My kids' animal reports were FANTASTIC!! I think the time spent at the beginning of the week creating a class report and really sparking their interest with the bald eagle report on the background of the SMART Board really helped to create an interest in the writing assignment…not to mention, it made the process much smoother. Needless to say, I am excited to teach this again as we save our steps on the SMART Board (Teacher Journal).

The best part about using the SMART Board in ways similar to the one mentioned above

is that the lesson procedures can be saved along the way. Additionally, from year to year new

animals can be explored in the group writing process, but the format is easily saved and retrieved

from the computer. Fun and interactive lessons can also be easily created and saved on the

computer for future years. For example, this year I created a SMART Board lesson to help my

students explore proper nouns.

> **Tuesday, December 4, 2007**
> It was real simple, just discussing the difference between a common and a proper noun. The kids seemed to get the concept, so we started moving proper nouns into a box and discussing why each one began with a capital letter. The kids were great at distinguishing the proper nouns and as time went on in the lesson, became even better at explaining *why* the word needed a capital letter. Everyone was so excited to participate and to take on the role of the teacher during this lesson! (Teacher Journal).

It is evident that I believe SMART Boards are fantastic learning tools to enhance the

education of all types of children and all types of learning styles. I also think it is a valuable tool

for a teacher to use to get students more engaged in lessons and excited about the material

presented. Additionally, I feel it is a great organizational tool for me and easily gives me the

opportunity to save wonderful lessons without any filing! Naturally, I figured that if I loved

using the SMART Board all day, my students would as well. I gave them a very easy to read

SMART Board Survey. They simply had to circle how they preferred to learn in Math, Reading/Phonics, and Science (See Appendix C). In both Math and Reading/Phonics, 14 out of 17 students (82%) wanted to learn either using just the SMART Board or using the SMART Board plus another item (counters or our reading book). However, in Science, only two students (12%) said they preferred to learn using the SMART Board, while the others would rather use our Science packets or hands-on experiments. I believe this is the case because our Science curriculum is interactive for all students simultaneously.

In other classrooms within my school, SMART Boards are being used as well. A kindergarten teacher explained that the students "absolutely enjoy being able to interact with the board by dragging items or writing with markers or their fingers." A second grade teacher explained that she thought the SMART Board was a beneficial learning tool for students because "it can be another avenue of seeing the information. I also like that I can share things that I find on the computer with my students as a whole group and they can all see it." Again, these two teachers also seemed to feel that there are many positive aspects of using the SMART Board in their classrooms.

<u>Obstacles</u>

In research, there are always obstacles one must overcome in order to complete a project. When using technology, there are even more hurdles to surmount. When combining research *and* technology, of course there will be a myriad of complications along the way. Nevertheless, the problems that I ran into helped to shape my research. I was able to conquer some difficulties easily, while others changed the path of my research.

At the beginning, my biggest fear in choosing to do research involving the SMART Board was actually having the technology. I was "housing" the equipment for the first grade team, but it was not necessarily mine to keep for an extended period of time if someone else asked to borrow it. Of course, this was a big area of anxiety and stress for me when choosing a research area, but with a little motivation from my research group members and my principal, I realized that if someone needed the equipment, it would all be a part of my research. At the beginning, I honestly thought this would be my biggest hurdle throughout the research process. Looking back, I can say that this was the easiest obstacle to overcome. No one on the first grade team asked to borrow the equipment until mid-February. At that point in time, I had already finished my data collection!

Another obstacle I encountered was the time factor. I believe all teachers would agree that there is never enough time. Some SMART Board lessons are already made and can easily be downloaded and used right away. However, many topics are not covered yet in the SMART Software database and you have to make the lesson yourself. Being quite particular about my teaching, I prefer to design my own lessons anyway. This, of course, requires more time spent outside of the school day to make the interactive activities. Having a new reading program this year made this even more difficult because I was constantly making new SMART Board lessons

for the material we were going to cover. Although I would not say I overcame this obstacle by any means, I did feel as though I made great gains in making some lesson templates that I can easily modify and use again next year.

In addition to the time needed to make or find the lessons, I also needed time to set up the equipment. Since the projector and board are not installed in my classroom, I have wires and cords running all over the place. These cords obviously cannot be left on the ground when the board is not in use. Additionally, because the projector is not mounted, it rests on a cart or a desk, where students can bump into it. If they hit the cart, the board will need to be reoriented, which takes time and distracts from the lesson. As the Kindergarten teacher stated, "I also hold the opinion that if we had a SMART Board like the computer lab (where all of the components are permanently set up), the circumstances would be different. It wouldn't take up too much room in the class and there wouldn't be a chance for the children to bump into it or create shadow puppets with the projector." This was an obstacle that I could not overcome but simply dealt with and noted throughout my research. Of course, the computer technology teacher and I are trying to obtain more boards so our teachers can begin having SMART Boards installed in every classroom.

Even though the students seemed excited during each SMART Board lesson, it was difficult to just call on one student at a time to answer. Being so young and sometimes quite impatient, this was challenging for first graders. At times, I would call more than one student up to the board and they would each have a different task within the same question. In that way, I was able to get more students to participate in shorter periods of time. Additionally, sometimes I had students have a similar worksheet on their desks that they had to complete if they did not come up to the board. Oftentimes, I had each student use an individual whiteboard (non-

interactive board that the student wrote on with dry-erase markers) on the rug to keep them

involved and interested. All of these obstacles helped pave the path of my research and enabled

me to use innovative ways to deal with or solve the problems.

Emerging Questions

After completing my data collection and analysis, I felt very good about my research and my findings. I believe I know my students better and have a firmer grasp on who they are as individual learners. However, not only was I left with a few unanswered questions, but I also have additional questions about the use of SMART Boards in the classroom.

Right now, the SMART Board is still a unique way of learning for my students. It easily became a part of their daily lives. Although I did not see any change in their attitude as I began to use it more, I wonder if the novelty of the technology will wear off some time down the road. If they are learning with a SMART Board consistently from first grade to third grade, when they get to fourth grade, will it become less interesting and fun? Now that I have explored the use of the board for a short period of time, I think it would be interesting to research a cohort of students using the SMART Board over a longer period of time.

In the same respect, will students like Erin who struggle with self-esteem and anxiety issues get used to using the technology after repeated exposure year after year? It would be interesting to place Erin in a second grade classroom that has a SMART Board to see if she exhibits more confident behaviors when the SMART Board is used. Additionally, is there anything else that teachers can do to make students feel more comfortable using the SMART Board when they do not enjoy answering in front of the class? These are both questions that I will continue to explore in my classroom with the use of the SMART Board.

One of the biggest emerging questions for me deals with next year. At the beginning of this year, I found out I would be teaching a visually impaired child next year. Of course, I immediately thought about how much of my teaching has focused on the SMART Board over the past year. How can I modify my SMART Board lessons to make them as meaningful for

someone who is visually impaired as for someone who is not? After attending Paula's

Individualized Education Plan (IEP) meeting in April, I will get a better grasp on Paula's

academic capabilities and will be able to think about how to modify the use of this technology

for her. This will be a big challenge for me, and I am looking forward to exploring my teaching

and making the necessary changes so that Paula receives the same quality education as everyone

else in my classroom.

During my research, I visited another elementary school in my county which had

interactive whiteboards in every single classroom. When asked how they were able to financially

complete such a task, the principal and technology consultant stated that their superintendent and

assistant superintendent wanted to institute this technology, so it was placed in the budget.

Teachers needed to put in a request to get an interactive whiteboard and had to take a training

course before the boards were actually installed. Projectors in this school were not mounted due

to air conditioning units that would shake the projectors in the ceiling. It took the district about

seven years to install interactive whiteboards in all of the classrooms. The principal and

technology consultant explained that the money was in the budget and that nothing had to be

removed in order to obtain the boards. Is it simply the authority figures in a district that decide

whether or not money can be made available for a task such as this? Can school districts

approach this goal in any other fashion? I would love to look further into what may have been

cut in order for school districts to institute this technology in all of their classrooms.

If my district decided to start installing SMART Boards in every classroom, I wonder if

teachers would use the board to its fullest capabilities. I know many teachers that use it simply in

place of an overhead projector. If that is the case, they do not need the actual SMART Board, but

simply a projector to hook up to their computer. When visiting the local elementary school, I saw

three teachers using the interactive whiteboard. Because these visits were scheduled in advance, one would think these teachers would have been prepared for my visit. Two of the three teachers appeared prepared and seemed to be using the board to its fullest potential. The remaining teacher was having her students draw shapes and one student would explore how to divide them into different fractions. I felt as though she could have done this same exact lesson using a whiteboard and dry erase markers. Or, she could have used the interactive whiteboard more effectively by creating a lesson about fractions in advance. It worries me that a district would spend a lot of money for the technology when teachers do not take advantage of all of the possibilities that exist with the use of an interactive whiteboard. How does a district support all of the teachers in the implementation and use of an interactive whiteboard at the onset? How will continued support be offered throughout future years?

Additionally, I would love to do more research regarding student participation and attitude during SMART Board lessons. Having someone to tally hand raising behaviors during more lessons or with more students would have been a great comparison tool. It makes me wonder if I would find similar results with academically advanced or average children. Also, would struggling students in another classroom or from another year show the same results? It really has been a fulfilling journey exploring the use of the SMART Board within my teaching and my students' learning. I have taken what I have learned and adapted my teaching because of it. All of the obstacles that I hit along the way and the questions and answers that I have come away with have helped to shape my teaching experiences and will continue to do so in the future.

<u>Conclusion</u>

"We often think of the learning process as a mosaic: lots of tiny pieces finally come together to form a picture. Learners are often scrabbling around, with their noses so close to the grindstone, trying to shape the fragments they have so that they can fit together – somewhere – that they take a long time before the picture falls into place. If it does. An IWB (interactive whiteboard) enables the teacher and learners to locate each fragment – the learning object – and show how it fits in the big picture" (*How do interactive,* n.d., p. 2).

Through a variety of data collection sources, I have explored the use of the SMART Board interactive whiteboard in my classroom. I explored how it affected my teaching and my students' learning. By using an interactive whiteboard, I believe that I have become a more confident teacher. As I create my own lessons and modify pre-made lessons on the computer, I am tailoring the lessons for the students in my class. With the technology in the classroom, I am able to keep the students involved in every aspect of a lesson much easier than without it. At the end of the day, I feel better about myself and my teaching when I know my students have had a chance to "experience" the learning and at the same time show excitement about the material presented. When a first grader is enthusiastic about learning the difference between *have* and *has* because they are able to interact with the material, it reinforces the reason why I chose to become a teacher. Thankfully, the use of an interactive whiteboard has made my life much easier to find and save ways to help students get excited about learning!

Student learning and participation were also key components of my research. Alex, the struggling learner who was very active absolutely <u>loved</u> when we used the SMART Board. Alex constantly had his hand raised to participate and actually seemed quite focused during most of the lessons. Alex seemed to enjoy using the SMART Board so much that he asked, "Where do

you buy SMART Boards? I want one for my house…for my birthday" (Teacher Journal – January 9, 2008). Erin, however, who not only has trouble academically but also battles some self-esteem and anxiety issues, also showed a slight increase in her participation when the SMART Board was used. It was interesting to watch Erin's confidence grow bit by bit during the course of a lesson. My students all seemed to enjoy learning when using the SMART Board. They thought using the SMART Board was a game…and even though we did play some games using the SMART Board, every activity was a positive learning experience for each and every one of them.

A mosaic piece of artwork containing many colors and a distinct tree acts as a visual representation of my research and learning. It is true that the learning process is very similar to a mosaic in that tiny pieces form together to make a picture. The most significant aspect of the picture is the tree. I believe that the tree signifies many facets of my teaching and education and my students' learning throughout this process. The tree represents me as a teacher and how I reach out to all of my students who embody different learning styles and personalities. The background of the artwork has not yet formed a picture, but the tiles are grouped together by color. This characterizes the steps that we are taking to integrate technology into our classroom. Eventually, all of the colors will mesh together to form a more distinct background – the blue tiles would form together to become the sky, the green pieces would become leaves on the trees or grass on the ground. With each step that we take in the direction of combining technology and teaching, we will see a shift in our artwork as the background of the picture becomes clearer for the students. The tree will also continue to evolve as I learn more about the effects of technology integration in my classroom.

References

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*, 457-469.

Fernandez, J. & Luftglass, M. (2003). Interactive whiteboards: A powerful learning tool. *Principal, The Embattled Principal, Tech Support, 83*, 63.

For and against – IWB's (10 May 2007). Learning – Thinking – Playing – IT Made Simple. Retrieved from the World Wide Web on October 16, 2007 from http://itmadesimple. typepad.com/learning_thinking_playing/2007/05/for_and_against.html

Hall, I. & Higgins, S. (2005). Primary school students' perceptions of interactive whiteboards. *Journal of Computer Assisted Learning, 21*, 102-117.

How do interactive whiteboards enhance learning? (n.d.). Retrieved March 17, 2008 from http://www.virtuallearning.org.uk/iwb/Learning_theories.pdf

Knowlton, N. (2006). Magic in the elementary school classroom. *SMART Technologies*.

Moorhouse, E. (2007, March 30). Mt. Laurel district shows off digital classroom. *Burlington County Times,* Section B, p. 1–2.

Promethean Technologies. (n.d.). Transforming learning using interactive whiteboards. *Miranda Net*. Retrieved March 15, 2008 from http://www.mirandanet.ac.uk/ftp/whiteboard.pdf

Rivero, V. (2006). The secrets of their success. *T.H.E. Journal,* 44-48.

SMART Technologies. (2006). Greenbriar West Elementary School: Fairfax, Virginia. SMART Technologies Case Study Report.

SMART Technologies. (2007). Highland Village Elementary School, Lewisville Independent School District: Flower Mound, Texas. SMART Technologies Case Study Report.

Vanderleer, K. (2007, Spring). Grand slam technology: Baseball helps students learn geography. *I.E. Magazine*, 16-17.

<u>APPENDIX A</u>

Implementation Plan

I did this research to explore the effects of interactive whiteboards in my teaching and my students' learning to see if SMART Boards were beneficial learning tools for students and valuable teaching tools for educators. Since I found positive effects in both regards, I would like to share this information with everyone I can, starting with individuals in my school district. I would like to present this information to my district so that they can see all of the positive effects it has on teaching and learning experiences. Hopefully, my principal, assistant superintendent and superintendent will understand the incredible benefits of this technology, and we can work together to implement SMART Boards into a few more classrooms each year.

I would also love to informally and formally share this information with my colleagues. I could present the information to the first grade team at a grade level meeting or to my colleagues at a faculty meeting. Perhaps that will inspire more teachers to borrow and use the technology in their classrooms. As more teachers request to use the technology and develop a comfort level with it, we can all group together to present it to those in administration. I would like to use my knowledge of the technology to assist my colleagues in taking advantage of the interactive whiteboard's possibilities in their classrooms.

Because I see the value of technology in my classroom, I have been writing grants to help obtain more SMART Boards for my school. I plan to continue to write and submit grant proposals. I now feel as though I have a much more powerful argument as I am able to include aspects of my research in the proposals. Hopefully, I will be awarded some grants over the next

few years to enable my district begin to implement such valuable educational resources into more classrooms.

Continuous reflection will enable me to make the changes and adaptations necessary to best meet the needs of all my students in the upcoming years. As I continue to reflect upon my experiences with the technology, I will strive to learn more about how best to use the SMART Board in my classroom. Further down the road, I would love to present seminars or help school districts implement interactive whiteboards or other means of educational technology into their schools and curricula.

As one can clearly see, my work on this topic has really just begun. Even though I have sections in my paper labeled "Findings and Implications" and "Conclusion", I am not closing the door and putting this behind me. I am interested in the effects of technology in the classroom and am inspired by its endless possibilities.

APPENDIX B

Subjectivity

During this research, I learned much about myself as a teacher and an individual. This project also strengthened many of my previous thoughts about my teaching and personality. From the very beginning, I was second guessing my decision to research this topic. One day I wanted to research SMART Boards and the next I was worrying myself sick over whether someone would ask to borrow the technology. Thankfully, with the support of my wonderful research group members Cindy and Karrie, I was able to begin my research with a new attitude. I have always known that I am a poor decision maker, not in terms of making "bad" decisions, but more that I *do not like* making decisions.

Of course, after my first decision was made (which research project to pursue), I knew I had a lot more decisions to make along the way. I believe that this research helped me learn how to make decisions and stick with them. During the rest of my research journey, I had to make decisions about many other things like what to write about in my journal, how to analyze and code my data, and what was important enough to note when writing my paper. I have come to realize that it is generally a good idea to stick with my first instinct, which in this case was to research how the use of a SMART Board affects my teaching and my students' learning. I was happy with that decision, as I continually research and evaluate different scenarios and lessons in my classroom with and without the use of technology.

Of course, decision-making was an extremely important aspect of my teacher research. Not only did I make new and important decisions every day, but I also learned a lot about myself in the process! In terms of my teaching in connection with technology, I realized that I absolutely love the excitement that builds inside the students about using the SMART Board. I felt that at

times, a bad day could be turned around effortlessly simply by using the SMART Board. In fact, I am sure I probably was a more enthusiastic teacher when using the SMART Board because I enjoyed the activities and the students' reactions to the lessons. Additionally, it enabled me to find new ways to teach the same topics and concepts, which is a pivotal part of instruction since my goal is to educate every personality type and learning style that enters my classroom. Clearly, it was very difficult for me to give up the SMART Board. Because I loved how my students reacted to the technology and I thoroughly enjoyed teaching with it, I contemplated purchasing my own board many times. In fact, if I was not planning a wedding and trying to buy my first house, I probably would have bought one already.

As I was writing my findings and implications portion of the paper, I realized how much I value organization. Before I could write any of that part of my paper, I juggled some ideas around about how best to organize the findings so that they would flow throughout the section. Additionally, I felt the need to combine "Findings" and "Implications" because it was easiest for me to organize the information so it would read, "This is what I found and this is what it means." I also recognized that my need for organization and anxiety about clutter (otherwise known as my "Gold" personality traits) are easily accommodated with the use of the SMART Board. All of my lessons are easily organized on the computer where I can name the files and folders based on subject, topic, or even lesson number! Furthermore, there is no paper to file for each of my SMART Board lessons – leaving my desk free of clutter! Technology is capable of doing such wonderful things!

My research about the SMART Board has enabled me to examine what kind of learner I am as well. I am a very visual learner, which is obviously a wonderful thing with the use of the SMART Board! I love seeing data in graphs (which is why I made graphs for some of my

information). It really helps me to understand the similarities and differences between students or lesson types much better. I also love to make lists of things I need to do or comparisons between students or topics. Sometimes I believe that I make lists simply to cross things off. Again, this supports the fact that I am very visual (and of course, very "Gold").

All in all, I felt as though this research project was a wonderful learning experience for me in many ways. I not only explored my own teaching, but also the effects of incorporating technology in my students' learning. I have come to realize that I am capable to integrating technology into the curriculum to best meet the needs of all of my students. Although we are still sharing the SMART Board with other first grade classes, my students have not forgotten their learning experiences earlier this year with the technology. They continuously ask, "Miss Ladislaw, when are we getting *our* SMART Board back?" and "Can you ask for *our* SMART Board back? I think they have used it long enough." Even though my research question focused on struggling learners with attention problems, I believe I have enhanced the learning experience of <u>all</u> students in my classroom with the use of the SMART Board interactive whiteboard. In doing so, I have fostered a successful learning experience for every student.
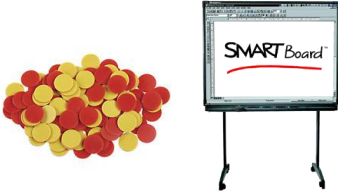
APPENDIX C

Surveys, Student Observation Sheets and Interview Questions

SMART Board Survey

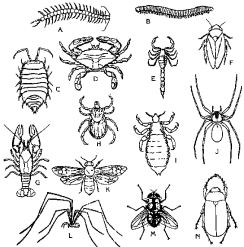Circle the way in which you prefer to learn for each subject.

1.   Math

Using the SMART Board	Using counters and the SMART Board	Using counters

2.   Reading/Phonics

Using our book	Using the SMART Board and our book	Using the SMART Board

3.   Science

Using our Science packets.	Using the SMART Board	Hands on experiments

Student Observation Sheet

Target Behavior: <u>Hand Raising</u>
(Tally number of times each student raises their hand to participate)

Date: _____   Lesson Time: _____

Lesson: _____   __ SMART Board   __ Regular

Student A.	Student E.
Student A. Notes	**Student E. Notes**

<u>My Notes:</u>

Teacher Interview Questions

1.   How often do you use the SMART Board?

2.   How do the majority of your students respond when you use the SMART Board?

3.   In what subject do you use the SMART Board most? Why?

4.   How many teachers on your grade level (or others) have asked to borrow the SMART Board this year?

5.   Do you feel that the use of the SMART Board benefits the students in your class? Why or why not?

6.   What is the biggest problem (yours or students) with using the SMART Board in your classroom?

7.   Are there any types of students in your room who respond really well to the use of the SMART Board? Any who don't respond well at all?