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An evaluation of the effectiveness of smart board technology by evaluating the students' ability of completing their work with focus on students with disabilities

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AN EVALUATION OF THE EFFECTIVENESS OF SMART BOARD TECHNOLOGY BY EVALUATING THE STUDENTS' ABILITY OF COMPLETING THEIR WORK WITH A FOCUS ON STUDENTS WITH DISABILITIES

by

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Abstract

Melanie K. Handler
AN EVALUATION OF THE EFFECTIVENESS OF SMART BOARD TECHNOLOGY
BY EVALUATING THE STUDENTS' ABILITY OF COMPLETING THEIR WORK
WITH A FOCUS ON STUDENTS WITH DISABILITIES
2010/2011
S. Jay Kuder, Ed.D.
Master of Arts in Learning Disabilities

The purpose of the study was to evaluate the effectiveness of SMART board
technology by examining rates of participation by students, and evaluating the students'
ability of completing their work while focusing on students with disabilities. Students
with learning disabilities sometimes have a lack of engagement in completing tasks due
to inattention. Technology such as the SMART Board helps students and allows them to
learn more effectively. The SMART Board also creates an opportunity for teachers to
differentiate instruction for all of their students. The SMART board can increase
motivation, offer self-paced practice, and create a high-interest learning environment.
Educators should have an interest in the use of this interactive whiteboard and how it can
enhance student learning.

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Chapter 1
Introduction

Over the past few years, technology in school classrooms has increased

tremendously. One newer technology that is being used in many classrooms is the

SMART board. The SMART board is an interactive whiteboard that provides touch

control of computer applications and is now found worldwide throughout classrooms.

The SMART board is a piece of technology used to help teachers bring more cooperation

and collaboration into the classroom. Through the use of the whiteboard system, students

are able to experience interactive lessons.

The topic of SMART board technology is an interesting topic because of its

recent wide spread popularity. Teachers are able to find resources, share lessons, and

exchange information with the use of the SMART board. It is important to be able to use

technology on a regular basis and continue with professional development so that

everyone is up to date on current topics. As an educator, I believe that the use of

SMART technology is very useful in today's classroom. It has been my observation that

the use of the SMART board engages students in lessons and allows them to actively

become apart of the learning process. Students are able to learn how to work together

collaboratively. It also creates an opportunity for teachers to differentiate instruction for

all of their students. The SMART board can increase motivation, offer self-paced

practice, and create a high-interest learning environment. Educators should have an

interest in the use of this interactive whiteboard and how it can enhance student learning.

Although many teachers report success using the SMART board, there is little

research on the effectiveness of this technology. Therefore, the purpose of this study is to

evaluate the effectiveness of SMART board technology by examining rates of participation by students, and evaluating the students' ability of completing their work while focusing on students with disabilities. This study will take a look at how students are participating in the classroom while teachers are using the SMART board. I expect to discover that students are more engaged in the classroom when using this whiteboard technology and contribute to the lessons more often than if they were learning without the SMART board. A key term throughout the use of this study that needs to be defined is the SMART board. The SMART board is an interactive whiteboard that is a large interactive board that connects to a computer and a projector. The projector projects the computer's desktop image onto the whiteboard's surface. The user controls the computer through the use of a pen, finger, or typing onto the computer.

Possible implications for schools while using SMART board technology include that administrators and teachers may think that it is just a large computer screen that is just taking over the use of blackboards. Some teachers have a difficult time adjusting to new technology and have a negative attitude about trying something new. The SMART boards are also expensive, and some school districts do not have the funding to purchase this technology. Another reason for pursuing this research is that currently there is not a great deal of research on the SMART board and if it improves academic achievement. The use of the SMART board can help a good teacher become a more productive teacher. Students learn when they are interacting. If the SMART board is properly used, it may increase student engagement and participation. Students with special needs gain an advantage educationally from the use of the SMART board. It gives these types of students an opportunity to learn in a differentiated way and enables them to learn in a

multi-sensory approach, which is beneficial to students with learning disabilities.

Through the use of research and professional development on the SMART board,

teachers will have the chance to learn how to best utilize this technology and make their

classroom a more effective learning environment.

Chapter 2
Review of Literature

The purpose of this study is to evaluate the effectiveness of SMART Board

technology by examining rates of participation by students, and evaluating the students'

ability to complete their work. The study will focus on students with disabilities,

including attention deficit hyperactive disorder and other health related disabilities.

Currently, the research on the use of the SMART Board is limited. There is some

evidence that the SMART board is a tool that gives students the opportunity to participate

and gain academic achievement. Through exploring the current research and data, there

is useful material and information that describes how the SMART Board has been

incorporated into our classrooms. Research on the SMART Board includes a collection

of findings from personal studies, academic literature, and international research on

interactive technology.

When using the SMART Board, it is important to remember that the teachers' are

using this interactive technology and learning how effective this tool can be in the

classroom. For some teachers it might be easier to adapt to new technology, but for

others, it may be more of a challenge to adapt.

A 1998 study (Bell) asked teachers about their opinions of this interactive

whiteboard. The survey asked questions about how the boards were being used, what

problems teachers' might have sustained, and the efficiency as a teaching tool. One

important question that was posed to the teachers' was if the interactive whiteboard was

easy to use. Teachers' were less than positive about the ease of setup of the SMART

Boards. Teachers found to be dissatisfied with the training that they received. Teachers'

would have liked to have more of an extensive training about the use of the board. They wanted to feel more comfortable and confident with the use of this interactive technology and be able to apply what they had learned, so that they could improve upon their interactive lessons. The most enthusiastic response considered how the board appealed to kinesthetic learners and the visuals that the board provides. Although this was a positive study, it was produced in 1998, which means that over the past 12 years, the SMART Board has increased in popularity and the company has improved their technology.

A more recent (2009) white paper was completed by the SMART Board Corporation to evaluate teacher conditions, and to reveal how the interactive whiteboard has made an impact on teacher workloads and stress. The purpose of this SMART Board white paper was to draw on research from North American, Europe, Asia, and Australia to evaluate teacher working conditions, to demonstrate the positive impact a well integrated interactive whiteboard has on teacher workloads and stress, and to share best practices for successful interactive whiteboard adoption in schools. A major cause of teacher stress includes too much work and not enough time to complete it all. It is also stressful when a teacher has the inability to meet the needs of all of their students. There are so many factors that come into play, which can include, learning abilities, cultural backgrounds and socio-economic status, and teachers generally work more than 50 hours per week. Interactive whiteboards supply time saving lesson planning, preparation, and help teachers differentiate instruction by focusing on the unique needs of individual students (SMART Technologies, 2009). To feel accomplished and comfortable with the use of the SMART Board, in order to feel like you are saving time and reducing stress, SMART Technologies states that teachers must have the appropriate training and support,

peer mentoring, an array of resources, and professional development opportunities.

The influence of this interactive whiteboard has contributed positively in the area of mathematics. In one study (Knight, P., Pennant, J., & Piggott, J., 2005), the use of the interactive whiteboard in daily math lessons was investigated. The researchers of this study collected data, which included observing students, student interviews, student questionnaires and pre and post testing. In research workshops the group of teachers shared knowledge of technology and the aspects of the whiteboard that they thought would be very useful in a students' learning. The researchers decided to take a specific look at certain themes which developed from the study, which include how the SMART Board made a positive impact on motivation and engagement, self esteem, and revisiting prior learning with particular students. The findings of this study indicated that student confidence in the learning they achieved appeared to be supported by the ability to revisit previous learning, allowing students to move forward educationally. When researching engagement of students during math lessons, one teacher studied the relationship between learning styles and engagement levels when using the whiteboard. The teacher was able to note increased levels of motivation and engagement but was unable to identify the links to the interactive nature of the resource. The researchers had difficulty distinguishing between the effects of the teacher's own classroom expectations and management, and the role of the interactive whiteboard. The levels of engagement were not always focused on the subject. Throughout the year, the teacher noticed that students responded more to the visual portion of the material, rather than the actual math lessons that were being taught. It was also made evident that when the material became more demanding, it was difficult for the students to stay engaged. In another study (Savoie,

2008), the teacher's goal was to increase student motivation in math through the use of technology with the use of the SMART Board. The strategy was to collect data over 3 periods: pre SMART Board, introductory SMART Board, and a concluding SMART Board period. The researcher gave students a 10-question survey of how they feel about learning math facts and concepts. All of the surveys were given after each training period. From the results of the survey, the students noted that math class was more interesting and more understandable when using the SMART Board. The students were also more likely to share what they were learning with their families. Savoie found that motivation was increased in math after the introduction of the SMART Board.

Overall, the teachers who worked on this research thought that the interactive whiteboard enhanced student's motivation. They appeared engaged when learning, and enjoyed instruction when the SMART Board was incorporated. Although this was a positive study on the use of the SMART Board, the research was only based upon six teachers and how their individual students performed in their classrooms while using the interactive whiteboard.

In 2004, a teacher (Adrian, 2004) decided to analyze how an interactive whiteboard could be helpful through increasing student contact time and decreasing any behavioral issues that arise within a classroom setting. The participants in the study included a fourth grade class and their parents. A survey was completed by the parents concerning technology use in the classroom. The teacher documented the use of technology by writing notes into their lesson plans and having students share their opinions on lessons with technology. These methods of collecting data allowed for a personal view of how the interactive whiteboard was working in the teacher's classroom.

Although the whiteboard brought some enthusiasm into the classroom, the teacher was frustrated with the whiteboard because it diverted attention from the actual lesson that was trying to be taught because the students were so fascinated with the interactive whiteboard. This proves a point that computers are very useful in classrooms, but can also be an annoyance because of technical difficulties and possible interruptions. The teacher observed while using the whiteboard during lessons about editing sentences and paragraphs, it enables teachers to emphasize and visualize important concepts. Using the electronic pens and keyboard, students began to eagerly share their editing processes (Adrian, 2004). The teacher noticed an increase in participation as well as completing seatwork. The students appeared more comfortable revealing answers to the teacher when the interactive whiteboard was being used. The teacher found by reviewing notes, conferencing with students, and receiving parent input, incorporating technology on a regular basis improves instruction (Adrian, 2004).

Obviously this particular teacher found that through the use of the SMART Board, lessons were more motivating and engaging. She had found that the study turned out to be very positive and was very pleased with the results. It became clear to the teacher that all of the advantages of having a SMART Board far outweigh all of the negative technological aspects such as computer difficulties and inattentiveness.

The SMART Board allows teachers to produce more engaging and motivating lessons for their students. A high school math and technology trainer in Virginia states, "I have to put more thought into how I organize my notes and think more carefully about what and how I present" (Loschert, 2004). With SMART Board technology, it is so much easier to just open a file, and have all of your notes saved for all of your classes, so

that one does not have to erase it off of the blackboard and start all over again for the next class. Students also spend less time copying notes for class, and have more time to participate in class discussions, which are now more engaging with the use of the SMART Board. Teachers are starting to notice that students actually want to come up to the board and participate more with lessons than ever before. These teachers from Edison High School in Virginia believe that the use of the SMART Board enables more effective teaching and student participation.

An educator in 2004 inquired about the use of a digital whiteboard for her classroom, and received a research grant to investigate the SMART Board's effectiveness in a first grade classroom. She felt that the use of the whiteboard would be of help while trying to teach reading. The result of the research showed that there was not a considerable amount of data to prove the digital whiteboard was more effective than traditional skill instruction. However, the teacher did find the interactive whiteboard to be effective in other ways, including as an organizational tool for lessons, an efficient way to follow up on previous lessons that were learned, and it had the ability to keep her students engaged during literacy instruction.

Solvie (2004) found that through the use of the digital whiteboard, she was able to share useful strategies with her first graders as well as create a setting where the students felt comfortable enough to interact with her as well as the other students in the class. The interactive whiteboard allowed her to prepare for lessons that included several activities including vocabulary, phonetic practice, and narratives. The SMART Board was beneficial to the teacher when she needed to revisit or review a previous lesson so that any student would have the ability to gain knowledge from that specific skill and make

future educational connections. Solvie's students were constantly engaged and fascinated with lessons that incorporated the SMART Board. According to Solvie, students viewed work done on and with the digital whiteboard as being fun. At the same time, they saw it as another learning tool (Solvie, 2004). Even though Solvie's research did not result in any major findings that the interactive whiteboard improves student's literacy ability, there was an ample amount of evidence to prove that the SMART Board improves student participation and motivation in the classroom.

An action research study was presented to determine the use of the interactive whiteboards as a teaching tool on student engagement. In 2002, William Beeland examined middle school teachers and students and their involvement with the use of the SMART Board. One of the purposes of his study was to establish if interactive whiteboards were having a positive, educational effect in teaching middle school students, and if the school districts should continue to invest their money on this technology. Beeland describes that the interactive whiteboard can be classified into three modalities: visual, auditory, and tactile learning. The extent to which each of these three modalities is incorporated into a lesson may determine the extent to which students are engaged in the learning process and, thus, are motivated to learn (Beeland, 2002). As a teacher, it is important to acknowledge how important the role of student engagement plays into the classroom environment. In order for students to learn and retain information, these three modes of learning should be included into instruction so that students will have the ability to understand the material that is being presented to them.

Student engagement and motivation were measured using surveys and questionnaires, and the modes of learning while the whiteboard was in use, were also

recorded. Both teachers and students were asked to complete a survey regarding

motivation and engagement. In their findings, the use of the interactive whiteboard as an

instructional tool does affect student engagement. Student responses to the survey

revealed that they enjoy using the SMART Board in the classroom and teacher responses

to the survey also revealed that they thought the whiteboard was interesting, relevant,

appealing, and involving. In other findings, the manner in which the teacher used the

whiteboard was recorded on a form based on the observations of the researcher. Data that

was recorded included the frequency with which text, graphics, video, and sound were

used during the course of the lesson, as well as the number of times students and the

teacher made contact through touching the board (Beeland, 2002). The information will

be useful to school districts in deciding to purchase SMART Technology.

In a similar research study, students were asked to report if they were more

motivated to learn when the SMART Board was in use. The researcher divided students

into two separate groups. The experimental group was given as assignment where they

were only allowed to incorporate the SMART Board into a group project, where the

control group was only given the option of using books, encyclopedias, marker boards,

and posters. When the project was completed, the researcher than had the groups switch

and complete a new assignment. The students that were not able to use the SMART

Board, were now able to use the technology, conversely, the students that were using the

SMART Board, now had to use the other forms of information. The findings reveal that

the control groups appeared less motivated when working on the specific projects that the

students were assigned. A survey stated that students indicated high motivation and

enjoyment when using the interactive whiteboard. Although this particular study proved

that students were more motivated and engaged when using the whiteboard, this may not be the case for everyone. Another school, with different students and teachers, in a different socio-economic area, may enjoy using the less advanced, technical options.

During the school year of 2002, a school in Ontario, Canada, decided to study the use of the SMART Board and improving literacy with special needs children. The study examined if the SMART Board would contribute in improving language skills of classified students, and as an outcome, there would be positive participation and retention in the classroom as well as if the SMART Board improves the learning setting for special needs students. Before the study, approximately one in ten students in Ontario schools did not benefit fully from a traditional educational program because they have a disability that impairs full participation in classroom activities (Webber & Bennett, 1999).

The teachers of this school thought that technology would be of use to students with special needs, so that they would be able to engage in basic drills, communicate, and explore certain activities in the classroom with the use of the SMART Board. The study was designed to assess the use of a SMART Board in improving literacy with special needs students. The study investigates two specific questions, which include if the SMART Board will assist in improving language skills of special needs students, and as a result, simulate positive participation and retention in classroom activities, as well as if the SMART Board improves the learning environment for special needs students. The Special needs teacher involved in the study was given training on the SMART Board and was asked to use the whiteboard for two weeks focusing on language arts lessons. Copies of notes were given to the special education students following the lessons, as well as having to copy the notes into their notebooks. Students' grades, which assessed the

retention of the particular lesson during the study, were recorded. Interview data was taken from the teacher in the study as well. The research was divided into three phases, which included a pre-SMART Board phase, and introductory phase, and a follow-up SMART Board phase. The researchers collected pre-test and post-test data using spelling assessments as the assessment tool. Interview data regarding behavior and participation were recorded as well. The results of the research proved that after a few months of exposure and involvement of students with the SMART Board, classified students with the most academic difficulty, developed the most improvement. The teacher noted an increase in participation of all students. It appeared that there was a correlation between the need for modification and the change in the degree of participation with the students. According to the teacher, the students' anxieties with making errors reduced when using the interactive whiteboard and they communicated more with peers. The special education teacher noticed that the most significant quality was the attention and motivation the students had when they worked on the SMART Board. There was also no sign of diminishment in enthusiasm when completing tasks on the board. The SMART Board helped the special needs teacher improve the learning environment for her students (Clovis, Salintri, & Smith, 2002). The classified students were able to participate in classroom activities, reduce their anxiety, improve their ability to focus, and were engaged during the SMART Board lessons. A longer research period is necessary to determine if there was a positive impact on learning skills.

In examining new ways that teachers can modify their classrooms to accommodate students with ADD or ADHD, Jamerson (2002), examined the use of the SMART Board in her classroom. Jamerson's purpose for the research was to find out if

students are more attentive and motivated when using the SMART Board technology. Students were given several types of technology, and the objective was to find out which tools were motivating in the classroom and which tools were not useful. Before technology was integrated into the teacher-guided lessons, some of the other students sat lifeless (Jamerson, 2002). When the SMART Board was introduced the students were excited to be called on and wanted to participate in all of the class discussions. Jamerson noticed that students that were a behavior problem before in class, were now paying attention, and behaving in the classroom.

Even though the study only focused on a group of 14 students, Jamerson observed that her students were excited and motivated to come to her class and learn. The classified students with ADHD were attentive and less impulsive. The SMART Board proved to be a success and this visual tool is now a key component in her classroom.

A major strength of the interactive whiteboards is the potential that they have the ability to speed up the process of sharing information and developing new and innovative lessons to teach students ranging from pre-school age all the way through college. Interactive whiteboards have the ability to accommodate students with special needs. A student with a fine motor delay has the capability of using a special pen, a fist, finger, or an object to help operate the board. Those students who have difficulty with movement can also use switch systems to help with the operation of the whiteboard. Students with visual challenges can use the whiteboard to resize the text, and adjust brightness or contrast. Deaf students have the ability of using the finger-touch tool, and that will not interfere with the students signing. For students with autism, ADD, or other mental/behavioral challenges, the whiteboard can capture the students' attention and keep

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them on task. The whiteboard may give those students the ability to share and answer questions, which creates a positive learning environment. The opportunity to present information in multiple ways, allow flexible means of expression, and engage learners of the digital age makes it a vital part of today's inclusive classrooms (SMART Technologies, 2009).

Through all of the literature that has been reviewed, it suggests that student engagement, motivation, and participation are important when comparing with the use of technology in the classroom. Most of the research indicates that students gain a sense of academic achievement when using the SMART Board. Researchers looked at the impact of the interactive whiteboard through interviews, surveys, questionnaires, and double blind studies.

Student engagement, motivation, and participation are vital during the learning process. Technology can be used in a motivating manner, where students are excited to enter into the classroom and participate throughout all instruction. Through this study, I anticipate to find out that the teachers are incorporating the SMART Board successfully and realizing that their students are gaining knowledge and are actively participating through the integration of this technology.

Chapter 3
Methodology

The topic of SMART board technology is an interesting topic because of its recent widespread popularity. Teachers are able to find resources, share lessons, and exchange information throughout the use of the SMART board. The purpose of this study was to evaluate the effectiveness of SMART board technology by examining rates of participation by students, and evaluating the students' ability of completing their work while focusing on students with disabilities.

3.1 Subjects and Setting

There were four students selected for the SMART Board study. All four of these students are currently in the sixth grade. The four subjects are also currently twelve years of age. Three of the students are Caucasian, and one student is of Hispanic descent. All four of the students have a special education classification. Subject A, B, and D have a classification of Other Health Impaired, due to their Attention Deficit Hyperactive Disorder. Subject C has a classification of Other Health Impaired, due to his school anxiety disorder and Attention Deficit Hyperactive Disorder. Subject A, C, and D are males, and subject B is female.

This study was conducted in a suburban middle school in Southern New Jersey. There are currently seventy students in the sixth grade at the school. The middle school is compiled of grades 6-8 and there are approximately 225 students within those grades. The study was completed in a sixth grade general education classroom with in-class support, during language arts class. All four of the subjects have in-class resource

program, which is also known as in-class support. In-class support instruction includes the use of two teachers: a special education and general education teacher.

For the study, the four subjects were the main focus. I only used the in-class support students as my subjects so that I could evaluate the students' ability of completing their work with the use of the SMART board. In-class support from a special education teacher is one way of keeping special education students in classrooms with their peers in the general education setting. General education teachers typically have an enormous amount of expertise in specific content areas. While the special educator is more skilled in the area of the teaching process as it relates to a specific individual. The method of research was a single subject design. These designs are typically used to study a change in an individual as a result of some treatment. In single-subject designs, each student served as her or his own control. The data included a baseline where the SMART board technology was not in use, and the treatment included the use of the SMART board.

3.2 Materials

The materials that were used included a checklist that was used to examine the subjects on task behavior. I constructed the checklist using each subjects and made a time-sample chart, every five minutes and would make a check on the checklist when a student was focused and completing their work. If there was not a check, it means that the student was not focused at the time and unable to complete their work. A chalkboard was used in the baseline portion of the data, while the SMART board was used in the treatment portion of the data. The chalkboard that was used was a smooth hard black panel, used for writing on with chalk; another term for the chalkboard is a blackboard.

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The SMART board is an interactive projection display that enables teachers to combine a variety of learning tools, such as websites, images, and videos into a teaching lesson. The Smart Board has an electronic pencil and eraser that allows users to mark up the screen, making it ideal for classroom use, PowerPoint presentations, and games. A model of the SMART board is attached (Figure 3.1). When deciding to collect the data for the study, it was best to obtain five days of baseline data and five days of treatment data. The first step was to complete a chart, using a checklist for every time the student was staying on task. The chart included a time line of every five minutes, for a total of a half hour.

3.3 Procedure

The first five days of data that was completed were the baseline data. Each student was given a writing assignment to complete during the language arts class period. The writing assignment consisted of completing an essay describing their favorite holiday. The instructions for the assignment were given both orally and written on the chalkboard for the subjects to complete. The assignment that was written on the chalkboard was not in very large text, so if the subject did not remember what it was that they should have been completing, they either had to ask the teacher or go up to the board and read what it was that they should be doing. As the observer, after every five minutes, a check was made if the student was staying on task and completing their work (see Figure 3.2). The on task behavior is defined as the student being oriented towards the work material (e.g., text, blackboard) or the speaker (e.g., their teacher during a lecture).

The next five days that was completed was the treatment data. Each student was also given a writing assignment that to complete during the language arts class period. The writing assignment consisted of completing a persuasive essay about whether or not

a sixth grade student should have the ability to have outside recess time, or if the principal should eliminate recess and give every sixth grader a study hall. The instructions for the assignment were given both orally and written on the SMART Board in large, bright text. On the SMART Board was an explanation of each step as a check off list as to what the students needed to complete while they were working on the writing task. Both teachers were also walking around to make sure the students understood what it was that they were to be doing and were there if help was needed. As the observer, after every five minutes, a check was made if the student was staying on task and completing their work. The object of this single subject design was to evaluate the effectiveness of the SMART board, and if in fact using this piece of technology helps students stay on task, and complete their work.

Figure 3.1 Schematic of Smart Board configuration

Audio System

Unifi Projector

SMART Board
Interactive
Whiteboard

Touch-Sensitive
Surface

Connection
Panel

Control Module

Eraser

Stylus
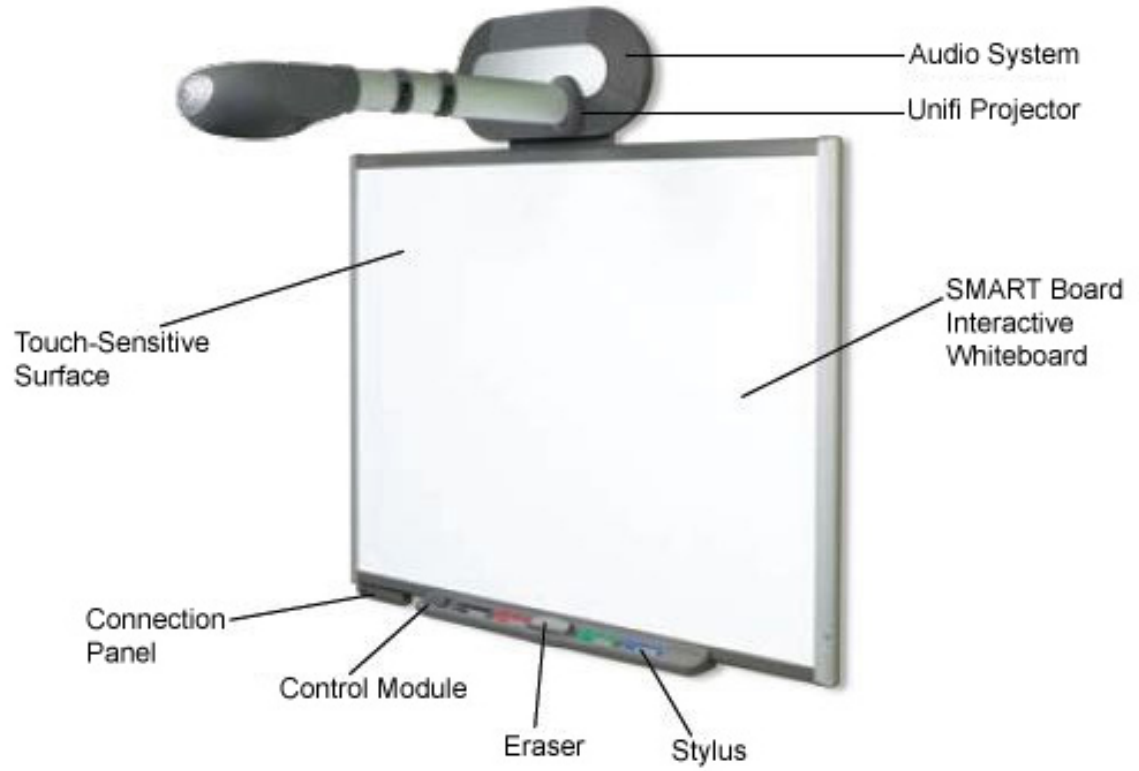
Figure 3.2 Student Checklist

	Student Checklist								
SUBJECTS:	TIME in 5 min intervals								
	9:45	**9:50**	**9:55**	**10:00**	**10:05**	**10:10**	**10:15**	**10:20**	**10:25**
A									
B									
C									
D									

Chapter 4
Data Analysis

The purpose of this study was to evaluate the effectiveness of SMART board technology by examining rates of participation by students, and evaluating the students' ability of completing their work while focusing on students with disabilities. During the data collection portion of the study, there were four students that were selected. All four of these students are currently in the sixth grade and have a special education classification. Each of the students is identified by Subject A, B, C, or D.

The method of research was a single subject design. During the baseline phase, each student was given a writing assignment to complete during the language arts class period. The instructions for the assignment were given both orally and written on the chalkboard for the subjects to complete. During the treatment data, the instructions for the students were given both orally and written on the SMART Board in large, bright text. On the SMART Board was an explanation of each step as a check off list as to what the students needed to complete while they were working on the writing task. As the observer, a time sample chart was constructed and after every five minutes, a check was made if the student was staying on task and completing their work.

The results for Subject A are shown in figure 4.1. During the baseline portion of the study, Subject A stayed on task a total of 23 times during the week. During the treatment portion of the study, Subject A stayed on task a total of 28 times during the week. The data listed above is categorized by the number of times that Subject A had the ability to stay on task and complete the work. The blue line represents the Baseline data and the number of times that they were able to stay on task and complete their work

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using the chalkboard as a guide, to what they needed to do for the language arts writing assignment. The red line represents the treatment data and the number of times that the subject was able to stay on task using the SMART Board as a guide.
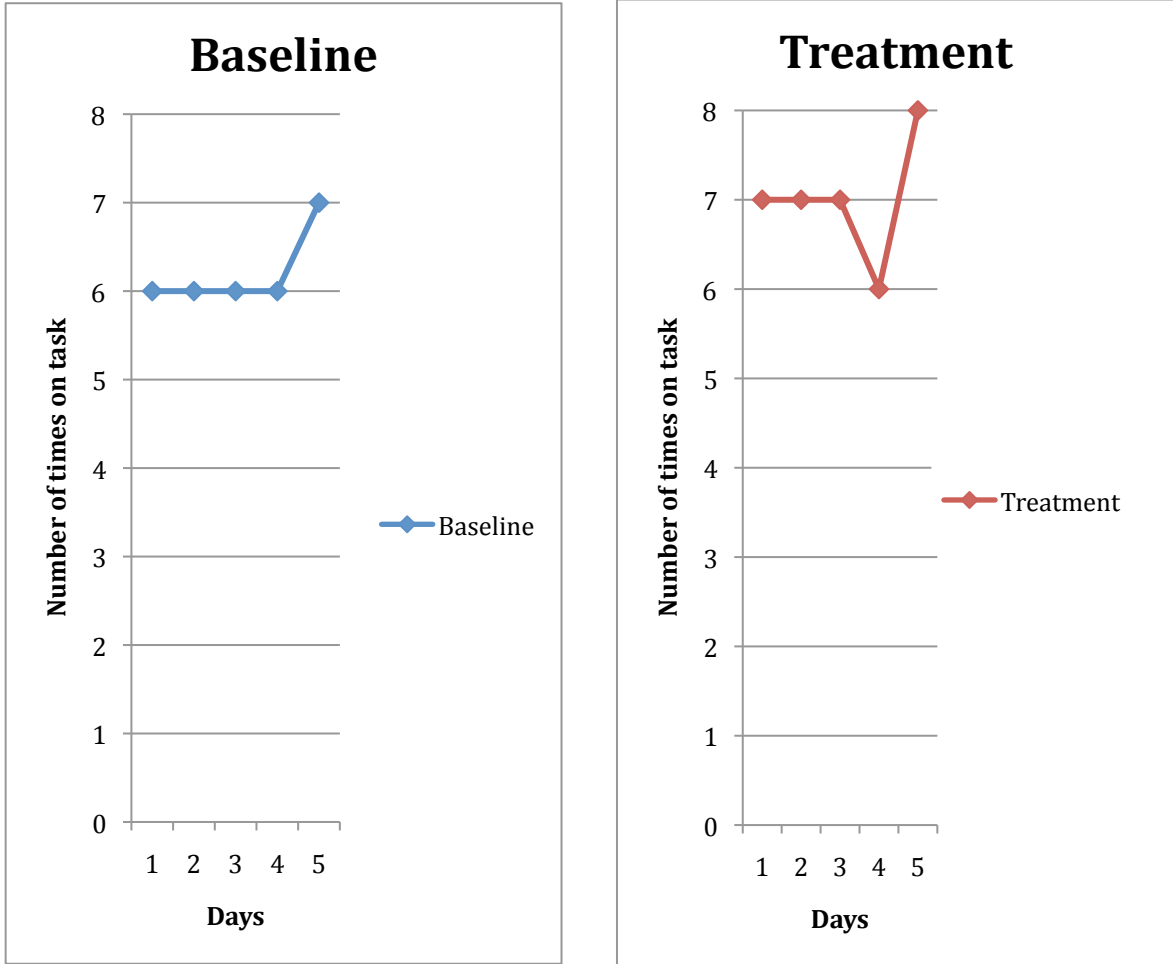
Figure 4.1: Results for Subject A
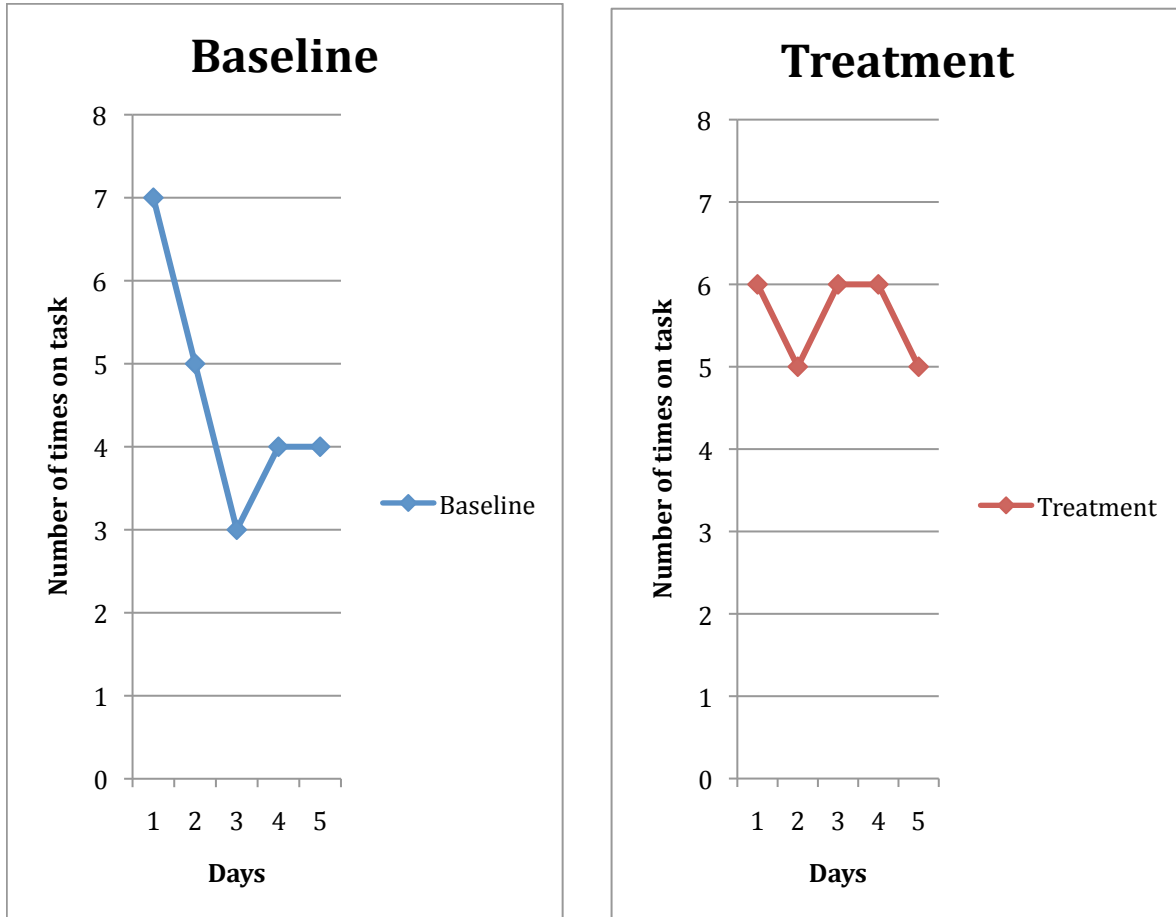
During the baseline portion of the study, Subject B stayed on task a total of 15 times during the week. During the treatment portion of the study, Subject B stayed on task a total of 18 times during the week (see figure 4.2).

Figure 4.2: Results for Subject B
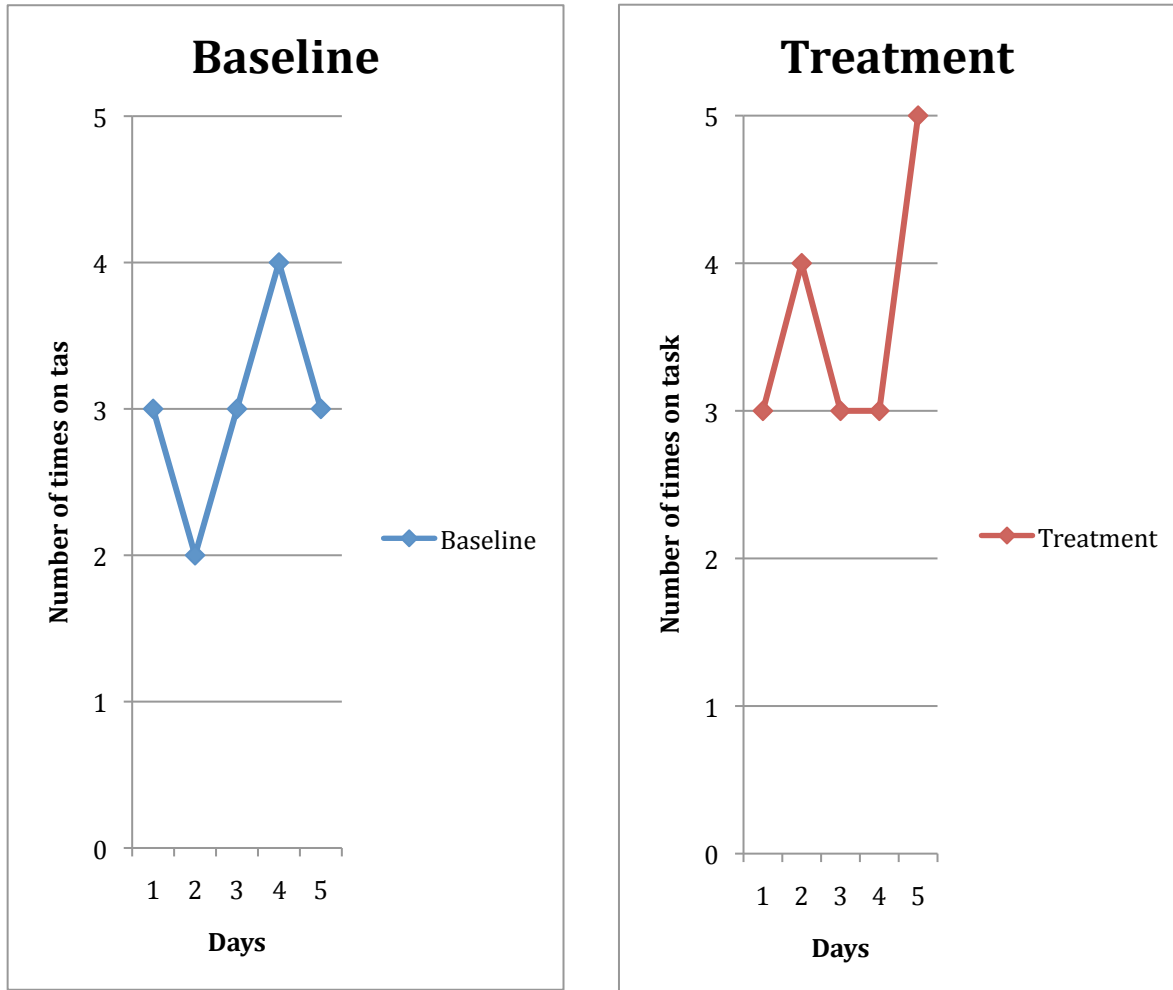
Figure 4.3: Results for Subject C

During the baseline portion of the study, Subject C stayed on task a total of 31 times during the week. During the treatment portion of the study, Subject C stayed on task a total of 35 times during the week (see figure 4.3).

During the baseline portion of the study, Subject D stayed on task a total of 26 times during the week. During the treatment portion of the study, Subject D stayed on task a total of 30 times during the week (see figure 4.4).

Figure 4.4: Results for Subject D
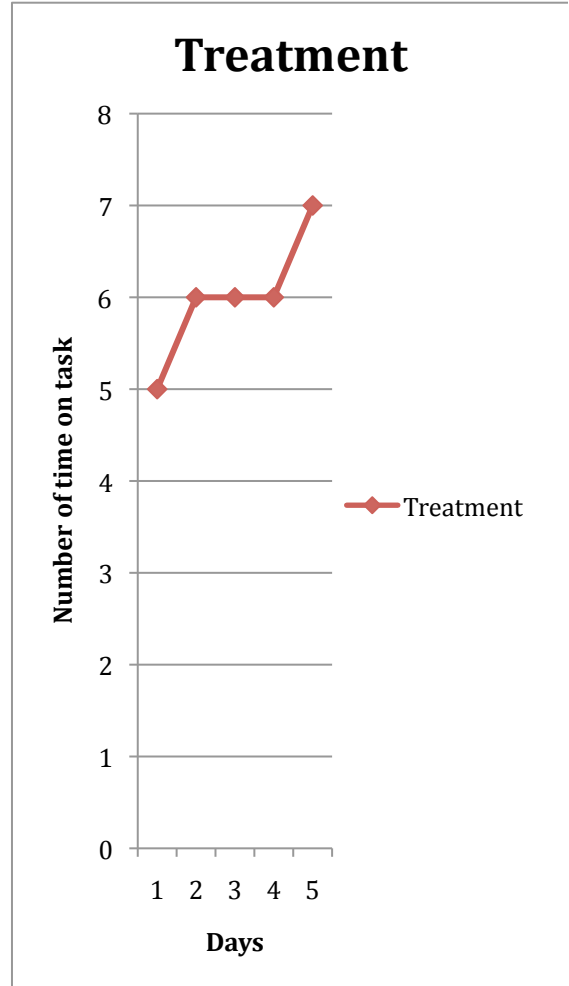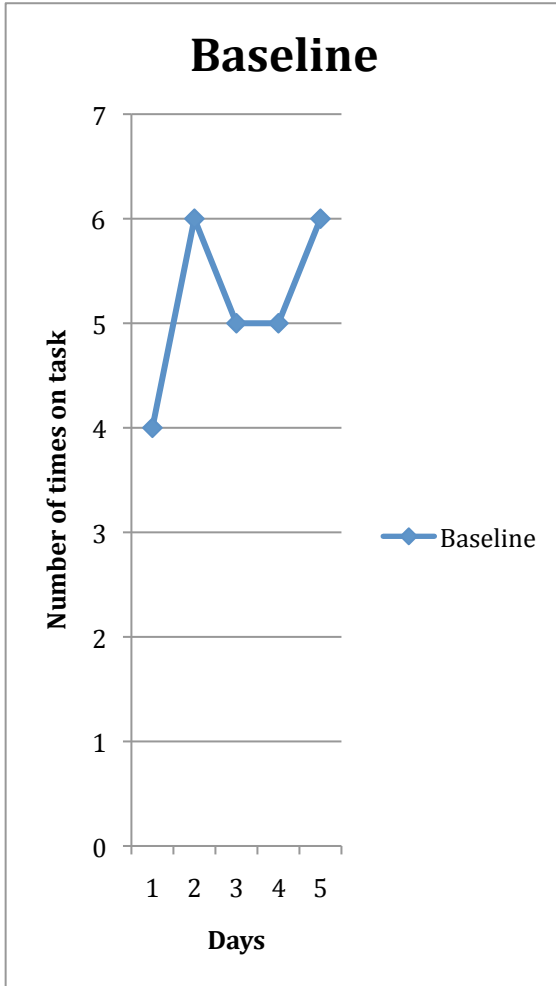
Chapter 5
Discussion

The purpose of this study was to evaluate the effectiveness of SMART board

technology by examining rates of participation by students, and evaluating the students'

ability of completing their work while focusing on students with disabilities. Four

students who received in-class support served as the subjects for this study. In-class

support is one way of keeping special education students in classrooms with their peers in

the general education setting. These students were selected so that I could evaluate the

students' ability of completing their work with the use of the SMART board. As an

educator, I believe that the use of SMART technology is very useful in today's

classroom. It has been my observation that the use of the SMART board engages

students in lessons and allows for them to actively become apart of the learning process.

The subjects in the study were studied over a period of five days during the

baseline data and another five days during the treatment data. During the time that the

baseline data was taken, the subjects were given a writing assignment to complete during

the language arts class period. Subject A and B seemed to have the most difficulty with

staying on task and completing their work while only having the chalkboard in front of

them as a guide for what they were supposed to be completing during the language arts

class. Even though the students desks were located in the front of the class, it did not

seem to matter and they were not on task as much as Subjects C and D during the

baseline data. Subjects C and D were consistent with staying on task. Over the period of

the five days of baseline data, they stayed on task and completed their work for a

majority of over five times out of nine that the subjects were observed during a forty-five

minute period. They did not seem to have as much difficulty completing their work as Subject A and B.

During the time that the treatment data was taken, the subjects were given a different writing assignment to complete during the language arts class period. The writing assignment consisted of completing a persuasive essay about whether or not a sixth grade student should have the ability to have outside recess time, or if the principal should eliminate recess and give every sixth grader a study hall. The instructions for the assignment were given both orally and written on the SMART Board in large, bright text. On the SMART Board was an explanation of each step as a check off list as to what the students needed to complete while they were working on the writing task. Both teachers were also walking around to make sure the students understood what it was that they were to be doing and were there if help was needed. During the treatment data, Subject A showed an increase in completing work and finishing the task at hand. Subject A's on task behavior increased compared to the baseline data with the use of a chalkboard during the third, fourth, and fifth day of using the SMART Board. Subject B did not show as much of an increase in completing work and staying on task. From day to day, the attention of subject B was inconsistent. There were some days when B was completing more work than other days. Both Subject's C and D showed a definite increase in staying on task and completing their work with the use of the SMART Board.

When comparing my results with previous research that was conducted, one study (Knight, P., Pennant, J., & Piggott, J., 2005), was completed for researching engagement of students during math lessons and the use of the SMARTBoard. One teacher studied the relationship between learning styles and engagement levels when using the whiteboard.

The teacher was able to note increased levels of motivation and engagement but was unable to identify the links to the interactive nature of the resource. In the present study, I was able to notice some improvements in task completion and engagement with the use of the SMART Board.

In examining new ways that teachers can modify their classrooms to accommodate students with ADD or ADHD, Jamerson (2002), examined the use of the SMART Board in her classroom. Jamerson's purpose for the research was to find out if students are more attentive and motivated when using the SMART Board technology. Students were given several types of technology, and the objective was to find out which tools were motivating in the classroom and which tools were not useful. When the SMART Board was introduced the students were excited to be called on and wanted to participate in all of the class discussions. Jamerson noticed that students that were a behavior problem before in class, were now paying attention, and behaving in the classroom. Jamerson observed that her students were excited and motivated to come to her class and learn. The classified students with ADHD were attentive and less impulsive. The SMART Board proved to be a success and this visual tool is now a key component in her classroom. I found my results to be similar with the subjects in my study. They were more attentive and intent on completing their work. The SMART Board was a success in work completion for some of the subjects in this study.

Practical implications for the classrooms while using SMART board technology include that administrators and teachers may think that it is just a large computer screen that is just taking over the use of blackboards. Some teachers have a difficult time adjusting to new technology and have a negative attitude about trying something new.

The SMART boards are also expensive, and some school districts do not have the funding for purchasing this type of technology.   Another reason for pursuing the research is that currently there is not a great deal of research on the SMART board and if it does in fact improve academic achievement. The use of the SMART board can help a good teacher become and more productive teacher. Students learn when they are interacting. If the SMART board is properly used, I believe that it can increase student engagement and participation.

For the current study as well as previous research show that students with special needs may gain an advantage educationally from the use of the SMART board. It gives these types of students an opportunity to learn in a differentiated way and enables them to learn in a multi-sensory approach, which is beneficial to students with learning disabilities. Through the use of the SMART Board, student with disabilities may have the ability to increase attention, motivation, and their engagement in the classroom.

As a result of this study, I worked with four in-class support students so that I could evaluate the subjects' ability of completing their work with the use of the SMART board. I think the study might have had a more positive outcome if I decided to use more than just the four classified students that were in the language arts class. I did not compare the other general education students in the class to the classified students. The results may have been more interesting and been able to gain more of an understanding into the comparison between classified students and general education students when completing work using the SMART Board. For the study, I could have used another subject as well as the language arts class that I decided to use. It might have made the study more valuable if math and language arts classes were compared when students are

completing work and staying on task. I also think that it would have been important to make the baseline and treatment data more than five days long. If it would have been a study for ten days, there may be more evidence to use to support that SMART Boards can increase the work completion and staying on task.

The purpose of the study was to evaluate the effectiveness of SMART board technology by examining rates of participation by students, and evaluating the students' ability of completing their work while focusing on students with disabilities. Students with learning disabilities, sometimes have a lack of engagement in completing tasks due to inattention. Technology such as the SMART Board helps students with different learning styles and allows them to learn more effectively. The SMART Board also creates an opportunity for teachers to differentiate instruction for all of their students. The SMART board can increase motivation, offer self-paced practice, and create a high-interest learning environment. Educators should have an interest in the use of this interactive whiteboard and how it can enhance student learning.

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