

The Digital Whiteboard As a Tool in Increasing Student Attention During Early Literacy Instruction

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Abstract

Much material is presented to students both orally and in text format as reading skills are introduced. It becomes very important for students to attend to and be involved in the literacy lesson to understand skills being introduced. If students are motivated and interested in the material being presented, attention to task should increase. It is believed that student acquisition and application of early literacy skills will increase if students' attention to task can be gained and maintained during instruction of early literacy skills. The digital whiteboard may serve as a motivational tool to gain student attention and actively involve them in lessons during which early literacy skills are being presented.

The purpose of this study was to investigate the correlation between use of the digital whiteboard as a delivery tool for literacy instruction in a first grade classroom and student attention to and participation in the literacy lessons. Student attention was identified as looking at the speaker, looking at the digital whiteboard, looking at reading material, manipulating props and materials used to present material during the literacy lessons, and not manipulating other materials that are not a part of the literacy lesson.

A study was conducted in a first grade classroom involving sixteen students. Literacy lessons were presented to the group of first grade students making use of the digital whiteboard, and on other days lessons were presented to the same group of students by the same instructor without use of the digital whiteboard. An equal number of lessons was presented making use of the digital whiteboard and without use of the digital whiteboard. Lessons were presented at the same time each day and for equal periods of time. Data on student attention was gathered during all lesson presentations. Analysis of the data revealed there was not a significant difference in student attention when lessons were presented with the SMART Board as compared to student attention to lessons presented without the SMART Board. An explanation for this may be that additional variables exist which may affect student attention to the reading lesson.

Student Attention and Early Literacy

This project was important in that much material is presented to students both orally and in text format as reading skills are introduced. It becomes very important for students to attend to and be involved in the literacy lesson to understand skills being introduced. In her book, *Beginning to Read, Thinking and Learning About Print*, Adams states, "Investigators have found repeatedly that the degree of engagement or attention that students invest in their schoolwork is directly related to how much they learn" (Adams, 1990, 112). This attention must focus not only on the task at hand but to units of phonemes, syllables, and words. Adams states that "the problem in developing awareness of the different units in our language, or linguistic awareness, seems to be that the capacity of our active attention is limited" (Adams, 1990, 51). To get the most from a reading lesson, students must demonstrate active attention. Adams also states that "the ability to read does not emerge spontaneously, but through regular and active engagement with print" (Adams, 1990, 71).

To be developmentally appropriate for six and seven year olds in a first grade classroom, lessons must engage students, be understandable, and seek to involve students in visual, auditory and kinesthetic fashions. "Developmentally appropriate classrooms are active, but not chaotic; children are on-task, but not rigidly following a single line of inquiry. Overall instructional goals are

merged with more immediate ones to create a flexible, stimulating classroom structure" (EdSTAR Minnesota). Through use of lesson materials, props, and activities, students are encouraged to attend to the reading lesson through sound, text, and visuals presented. Students are asked to interact with the materials presented.

Research has found that how much time students are actively engaged in learning contributes strongly to their achievement. Important management skills of the teacher identified in this research are sequencing course content so knowledge builds on itself, pacing instruction so students are prepared for the next step, monitoring success rates so students stay productively engaged regardless of how quickly they learn, and running an orderly, academically focused classroom that keeps wasted time and misbehavior to a minimum. (Bennett, 1986, 34).

Wilkinson and Silliman refer to Vygotsky's social constructivist theory and write that "learning requires student interaction and engagement in classroom activities – engaged students are motivated to learn and have the best chance of achieving full communicative competence across a broad spectrum of language and literacy skills" (Wilkinson and Silliman, 1994). Engagement may be encouraged through explicit scaffolding, direct explanations and re-explanations, invitations to participate in the conversation, and verifying and clarifying student understanding (Wilkinson and Silliman, 1994).

Structuring the classroom environment and features of lesson presentation to focus student attention and encourage student engagement may involve allowing frequent active (oral and physical) modes of student response within the framework of multisensory lessons which also include independent or group work. (Braswell, et al, 1991). "The trick is to determine an action interesting enough to hold the child's attention but not so stimulating that it causes a deterioration in attention to the relevant material" (Braswell, et al, 1991, 40). McCaughly (1996) identifies strategies for working with attention deficit children, indicates that color, movement, and action hold students' attention, and suggests that classroom presentations make use of dark, large print to aid tracking, avoid crowding of text, make use of boxes to aid in emphasizing key facts, and use multimedia/interactive tools.

Attention to task will ensure that students are more apt to acquire skills and concepts being introduced. Caine and Caine note that every sound and every visual signal is "packed full of complex meaning" (Caine and Caine, 1990, 67). Also, "the brain absorbs the information of which it is directly aware and to which it is paying attention" (Caine and Caine, 1990, 67).

It is understood that an instructor must use a balanced approach to the teaching of reading, using phonics, literature, and writing components in a scaffolded manner to deliver reading instruction and that students must be given multiple opportunities to apply this learning in the context of real reading and writing tasks. However, increasing attention to task will promote the acquisition and understanding of reading skills for student application. Along with teaching phonological awareness, phonemic awareness, alphabetic principles, and orthographic awareness, students must be taught strategies that help them attend to and remember what they read (Foorman, Fletcher, and Francis, 2000).

Helping students attend to the lesson or task at hand may include taking steps to maximize students' ability to focus on and participate in the lesson using visuals, auditory stimuli, and interaction with what is presented on the board. Skills that predict reading success following early instruction can be promoted, says the Center for the Improvement of Early Reading Achievement (CIERA), through a variety of classroom language and meaningful reading and writing events in kindergarten and grade one. Activities that promote this attention to sounds can be motivating and playful for young children, including oral renditions of rhymes, poems, songs, as well as writing their own journals and messages (CIERA, 1998).

Gaining the attention of the students to engage them in the reading task is very important. Preparing students for instruction and maintaining attention throughout the lesson is crucial if students are to gain from the lesson. Churchward identifies this as the focusing technique in which the teacher makes sure that he or she has the attention of everyone in the classroom before the lesson is started, through use of wait time and use of a quiet voice to begin the lesson (Churchward, 1986). Gaining student attention may be done using direct instructional techniques of telling students what will be happening and setting time limits for some tasks (Churchward, 1986). Churchward also describes the use of modeling, non-verbal cuing, monitoring, and creating an enjoyable environment for learning (Churchward, 1986). However, best practice identifies the importance of maintaining a balance between silent, passive, controlled students and purposeful talk, movement and autonomy on the part of the students (Zemelman, Daniels, & Hyde, 1998). Also important is a balance between teacher presentation and transmission of material and students actively experiencing concepts (Zemelman, Daniels, & Hyde, 1998). Checking or understanding of lesson content through sampling, signaled responses, group choral responses, and individual private responses are other ways to focus attention on lesson content and encourage student participation (Hunter, 1994).

Hunter indicates that paying attention may be increased by eliciting the alerting reflexes by relating information to the students themselves (self), by making the lesson pleasant (emotion or feeling tone), by encouraging students to respond to something different or novel (discrepant event), and by using an alerting stimuli such as pointing, demonstrating, changing the tone, juncture, or loudness of their voices, and verbal cues such as "notice this" (Hunter, 1994).

Important to focusing and maintaining student attention to the reading task is being cognizant of the amount of material which should be introduced to students during the lesson. Practice theory (Hunter, 1994) indicates that short meaningful chunks of information for short intense periods is more beneficial than lengthy lessons or those with a large number of concepts. McCarney (1989) also identifies the importance of adjusting lesson length and structure to meet students' attention limitations.

Visual display has been identified as being important in not only focusing student attention to task but also in creating understanding for learners. "Diagrams, outlines, webs, pictures, and time lines are 'right hemispheric,' nonverbal examples of the relationships or 'connections' that exist or are being constructed in the brain" (Hunter, 1994, 111). Modeling, or showing by teachers, also focuses attention to the learning task as the task becomes understandable and meaningful. "When teachers show what they mean by modeling and labeling a process, students have the opportunity for integrated hemispheric processing" (Hunter, 1994, 123). Johnson (2001) and Means (2001) note that technology can be used to engage students and improve instructional delivery while helping students master basic skills.

Research Method – Setting and Participants

This research project took place in a first grade classroom in a rural west central Minnesota school. The subjects in the study were all first graders (six and seven years old) in a self-contained classroom. The first grade class is one of three first grade classes in an elementary school of four hundred twenty students in kindergarten through grade six. Sixteen students participated in the study. Six of the students who participated were girls and ten of the students were boys. Reading instruction that was a part of this study is part of a language block that includes literature, reading, language, handwriting, and spelling.

The first grade students were at a variety of reading levels at the time during the school year when this research study took place. Reading instruction took place in a whole group setting during the time data on student attention was recorded. Individual and small group instruction later in the morning was used to address needs at various levels. During the lesson period when data was collected on student attention to task, students were instructed making use of a basal reading curriculum. At other times during the day students were instructed using a phonics and

writing program. Parent volunteers were also used on a daily basis to provide students with support and encouragement during oral reading experiences.

Method – Design and Procedure

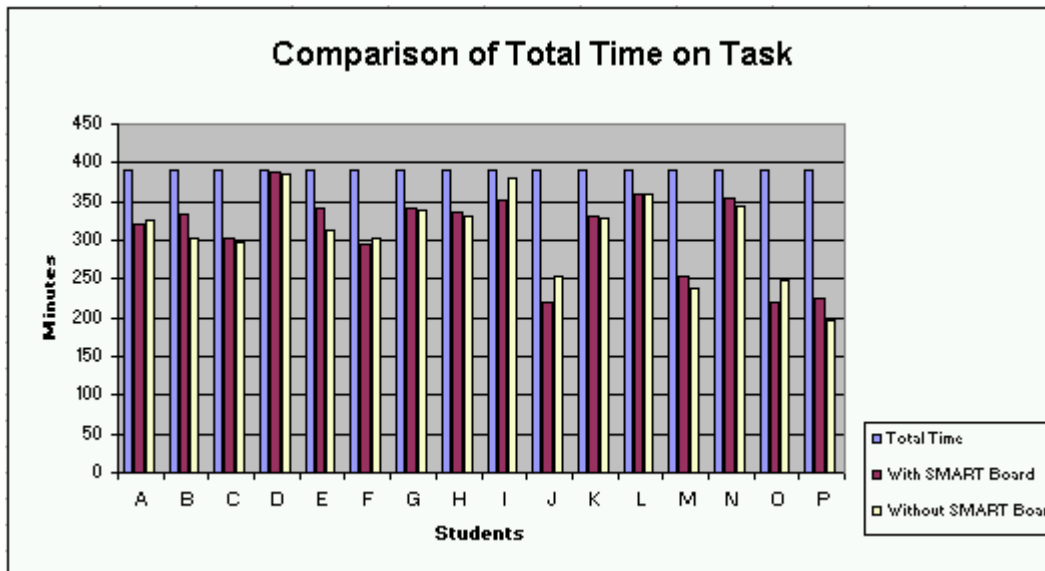
An equal number of reading lessons were presented to a group of sixteen first graders incorporating use of a digital whiteboard and without use of the digital whiteboard. At the beginning of each lesson, "attention to task" and "participation" were discussed and defined by the students. Student attention was identified as looking at the speaker, looking at the digital whiteboard, looking at reading material, manipulating props and materials used to present material during the literacy lessons, and not manipulating other materials (pencils, shoelaces, and books) which are not a part of the literacy lesson.

Data was collected on student attention by tallying the minutes during a thirty minute lesson during which students were not attentive, as defined above. Data was recorded by the same certified teacher, observing students during each lesson throughout the study. The teacher observing and recording data was not the teacher instructing the first grade students.

Students were asked to attend and participate in the reading lessons by responding orally and in writing to material presented. A SMART Board model 560 digital whiteboard was used for thirteen lessons. SMART Notebook 1.2 was used to prepare and present literacy lessons. Students observed, read aloud, and wrote on the text which was displayed on the SMART Board. Students responded to questions concerning the text on the SMART Board and wrote on the board with markers and at other times with their fingers, while the teacher held the markers. At other times students used SMART Notebook software tools to circle, highlight, underline, or erase text. During lessons presented with the SMART Board students read vocabulary words projected on the board. During lessons presented without use of the SMART Board students read vocabulary words from cards which the teacher held, and read text from a non-digital whiteboard. During both lesson formats, students used reading books to apply skills introduced in the lesson. At the conclusion of the study, students were interviewed, and responded individually to ten questions, regarding their attention to and participation in the reading lessons. Baseline data was collected, prior to and following the research study, on student achievement with reading skills. Due to the fact that a great number of variables prohibits correlation of achievement to use or non-use of the SMART Board, student achievement data will not be reported in this paper.

Results

The purpose of this study was to investigate the correlation between use of the digital whiteboard as a delivery tool for literacy instruction in a first grade classroom and student attention to and participation in the literacy lessons. The graph below displays comparison figures for each first grade student. Total time (390 minutes), student attention during reading lessons making use of the SMART Board, and student attention during reading lessons presented without use of the SMART Board are indicated.



Student attention to task was not significantly improved during lessons presented with the SMART Board when compared to lessons presented without use of the SMART Board, even though students appeared enthusiastic and expressed interest in the SMART Board. Nine students demonstrated a slight improvement in attention, two students' time on task remained the same, and five students attended better during lessons presented without use of the SMART Board during this research study.

The chart below identifies student responses to the question, "When do you attend the most?"

Student	When Do You Attend the Most?	Attention During the Research Study
A	With the SMART Board	Better without the SMART Board
B	With and without the SMART Board	Better with the SMART Board
C	With the SMART Board	Better with the SMART Board
D	Without the SMART Board	Better with the SMART Board
E	Without the SMART Board	Better with the SMART Board
F	With and without the SMART Board	Better without the SMART Board
G	With the SMART Board	Same with and without SMART Board
H	With the SMART Board	Better with the SMART Board
I	Without the SMART Board	Better without the SMART Board
J	I don't actually know	Better without the SMART Board
K	With the SMART Board	Better with the SMART Board
L	Without the SMART Board	Same with and without SMART Board
M	No response	Better with the SMART Board
N	With and without the SMART Board	Better with the SMART Board

O	With and without the SMART Board	Better without the SMART Board
P	With and without the SMART Board	Better with the SMART Board

The following chart indicates students' understanding of what attending or paying attention means. Attending, paying attention, participation and examples of each were discussed each day prior to the presentation of the reading lesson during the research study.

Student	What Does Attending or Paying Attention Mean to You?	What Could Help You Attend Even More Than You Do?
A	Listen, look at the SMART Board, not looking around	No response
B	Looking at the SMART Board and the teacher	Kids not talking so much
C	Look at the speaker	No response
D	It sort of means good because you learn more	If we went through the words more
E	Listen	Looking at the SMART Board and the teacher
F	Pay attention to the SMART Board, listen to the speaker	Not paying attention to anyone else
G	Listening, looking at what you're supposed to	Try harder
H	Listen, look at the speaker	No response
I	Look at the SMART Board when it's time to look	No response
J	Listen	Help from other people
K	Look at the SMART Board, look at the teacher	Point and read
L	Look at the teacher, do what everybody is	No response
M	Look at the SMART Board & teacher	Looking at the teacher
N	Look and do what the class is doing	No response
O	Look at the teacher, look at the SMART Board	The SMART Board
P	Pay attention and point	I don't know

Research Study – Limitations

The SMART Board was novel and created enthusiasm for learning on the part of the students as evidenced in remarks made during the lessons presented using the SMART Board and during individual student interviews, such as "I like touching the SMART Board," "My finger is magic," "I like when the lines get different," "It's a lot more easy [using the SMART Board], but I don't know why," "We used the SMART Board and it went ding, ding, ding," "My finger is magic," "Every part of the word is special," and "The board is magic." Students were engaged when they actually touched the SMART Board or manipulated text on it. When the teacher was manipulating text on the SMART Board it appeared to hold students' attention, but not as long as if students actually

did the manipulating. However, this difference was not specifically recorded during data collection on student attention.

Other props and materials such as pencils, books, and cards as well as other visuals in the classroom drew students' attention away from attention to the lesson also. Removing such stimuli may have affected attention to task during this research study. Two students indicated during interviews that it was easier to look at the teacher during lessons presented without use of the SMART Board because during lessons presented with the SMART Board they found it difficult to look at the teacher and the SMART Board. Student position or seating arrangement may affect student attention. Student seating was not controlled during this research study. Student manipulation of text on the SMART Board as compared to the amount of time the teacher manipulated text was not controlled. The SMART Board allowed quick and smooth transition from one screen to the next and allowed for effective use of lesson time. This did not seem to significantly affect attention to task in this study, however.

Further research is needed to identify situations that may increase student attention to and participation in the reading task during early literacy lesson presentation. Research on lesson length and the use of the SMART Board to gain student attention as well as research on student versus teacher manipulation of text on the SMART Board in relation to student attention during literacy lessons would be valuable.

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