The digital whiteboard: A tool in early literacy instruction

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Throughout years of working with primary-level students, ongoing coursework, and continual reading, I have attempted to remain abreast of current research and to employ methods of instruction that effectively address the diverse learning needs of my students. My desire to create a positive learning environment to engage young children while at the same time recognizing their developmental needs has continued to guide instructional practices in my classroom. This desire to improve my practice and meet children's needs prompted me to acquire a digital whiteboard for use in my first-grade classroom.

Because I believed that student acquisition and application of early literacy skills would increase if students' attention to task could be gained and maintained during early literacy skill instruction (Adams, 1990), I felt a digital whiteboard would help me to better teach reading. I applied for and received a research grant to investigate the whiteboard's effectiveness. I acquired the digital whiteboard and the stand to support it with part of the funds. While my research indicated that the digital whiteboard did not result in a significant improvement over traditional skill instruction, I found it to be effective in other ways. It proved to be an organizational tool for lesson preparation and an effective way to follow up on instruction. It also scaffolded learning for students within the literacy lessons, providing support to model and guide reading efforts (Tompkins, 2003). Finally, it engaged my primary students in literacy learning. In what follows, I will share what I have learned about the whiteboard and how it can be used for early literacy instruction.

The digital whiteboard and how it works

The digital whiteboard is an electronic version of a dry-erase board. I connected my digital whiteboard to a computer and installed the accompanying software. (Software to configure the board is available for both Macintosh and PC.) I configured the whiteboard so it became the computer's monitor. The board could be mounted either on the wall or on an adjustable, portable stand.

The digital whiteboard can be written on with regular dry-erase markers. Because it's electronic and is connected to a computer, electronic "virtual" markers or pens can be used. The markers are virtual in that they contain no ink, and they function by responding to their movement on the surface of the board.

The virtual markers are color-coded but the colors and marker line widths can be reconfigured easily from digital whiteboard software menus. I reconfigured the markers, making some write with thin lines and others with wider lines. I configured one of the markers to serve as a highlighter, leaving a wide fluorescent yellow line. The varying widths and colors were used to code text and conventions of print, sort and classify information in charts and Venn diagrams we created, and make revisions on drafts of stories. For example, the first graders decided during one writing lesson to iden-
tify in red all describing words in our interactive writing exercise. Naming words would be in blue. Coding the text with color allowed students to discuss ways in which the story was made more meaningful with use of descriptive words. I was able to model writing and reading tasks on the large screen and to have some work prepared ahead of class. The digital whiteboard encouraged students to read, highlight, add, and remove print from the text. The virtual markers were activated when lifted from the pen tray that held them on the digital whiteboard frame. Only one virtual marker could be used at a time. Students quickly learned to replace a marker before selecting another.

The board engaged students through kinesethics as they used markers or their hands to respond to the text, highlighting with color or drawing boxes and circles with the tips of their fingers or the palms of their hands. The first graders loved writing with the markers and their fingers on the board. Fingers could be used when someone held the marker, leading the board to recognize and create the line width and color of the missing marker. Writing with fingers allowed the children to feel the shapes of words they outlined, feel and see letter components that created sounds they uttered, and experience a true “hands-on” approach to creating and erasing text.

While these features of the board were fun to work with during the literacy lessons, the efficiency and usefulness of this tool—as opposed to traditional dry-erase boards or chart tablets and markers—was enhanced because everything was saved to the computer. Work could be revisited, revised, printed, and shared—either electronically or via hard copies—immediately and within the context of the lesson. The first graders often decided they would like a copy of the story we created. At other times, I chose to print copies for small groups to continue the work we had begun as a large group.

The digital whiteboard worked with other software I had on my computer. When I opened another program while running the whiteboard software, we were able to write over or illustrate on whatever was displayed on the digital whiteboard. I used PowerPoint to create slides of vocabulary we studied in connection with stories we read. The “vocabulary slides” let us highlight letter combinations, inflectional endings, and graphemic components of the words in our study of phonics and sight vocabulary. This exercise made interaction with text fun and engaging. With the touch of a finger on the board, we could move to a new slide and a new word. Touching the board functioned in a similar way to clicking mouse buttons. Students manipulated the slides to move from word to word—quickly when known words were displayed and more slowly when studying individual word parts.

The digital whiteboard allowed me to incorporate the Internet with my literacy lessons in more useful ways. The visibility of the 60-inch digital whiteboard was useful, but being able to draw on the illustrations and underline, circle, or highlight text found on the Internet sites really engaged the students. This helped to create meaning, make connections, and develop understanding during literacy lessons. Anything we created or re-created through such investigation during the literacy lessons could be saved or printed out for further work.

**The board as an organizational tool**

I prepared slides with lesson components ahead of time. I could use the whiteboard software to rearrange slides that I felt would lead to connections for my students regarding lesson components. The slides allowed me to frame lessons, moving from whole to part in our language study. In other words, we could begin with story text and move to parts of the text, to individual word study, and then to graphemes and phonemes within words. Lesson order could be negotiated within the presentation on the basis of students’ needs. Slides or components of the planned lesson could be skipped if not needed or revisited with groups of students who needed additional work later within the context of guided reading sessions or small skill groups. While the digital whiteboard software displayed work on the screen, smaller frames displayed the other slides on the right side of the screen. Such organization benefited me as a teacher because I was able to more accurately prepare and present lessons while making more effective use of time I had with the students. In addition, the ability to print copies of lesson text immediately for the students allowed the lesson to flow smoothly from large-group to small-group and independent work.
Creating an environment for early literacy learning

I wanted to create an environment for natural learning in my first-grade classroom (Bertrand & Stice, 2002; Cambourne, 1991; Cambourne & Turbill, 2001). Specifically, I worked to create a print-rich environment in which to immerse my students. I demonstrated reading and writing in ways that would lead to development of skills and strategies my students needed for independent reading and writing, and I created opportunities for them to approximate, take responsibility, and begin to use skills and strategies we studied. Through use of the digital whiteboard I modeled the ways in which readers and writers interact with text. I not only shared effective strategies with my students but also created an environment where students would interact with me and with others in their reading and creation of text (Tompkins, 2003). Mini-lessons, guided reading, and writing tasks were possible through use of the board in my primary classroom. The digital whiteboard allowed me to prepare lessons that included morning messages, cloze activities, vocabulary exercises, daily oral language sentences, phonetic activities, graphic organizers, and text narratives. With the board as a tool for literacy instruction, I was able to interact with the class, demonstrating and modeling, and manipulating what was on the board by touch. I was not confined to, or focused on, a computer that separated me from the class. Proximity was important for me in creating an environment of being and working together as a community of learners.

Using the Internet along with the digital whiteboard, I made use of video and audio clips to develop background knowledge and provide information on authors, characters, and settings, as well as appropriate background information on places and artifacts not found in our rural community. Students used their fingers on the board in lieu of a computer mouse to navigate to links. The video and audio clips provided sensory data, prompting engagement in the language and literacy lessons. While students were engaged with text and the board, I was able to monitor students' understanding and adjust instruction as needed.

At the conclusion of work with the board—before and after reading of books and students' written work—changes were saved to any print or graphic constructed, and copies of the group-constructed lesson text were printed so each student received a copy of the lesson for follow-up work in small groups with peers or the teacher. Such follow-up work could be reworked and reread, encouraging further engagement in the lesson. The "saved" work remained on the digital whiteboard for review and further follow-up if needed. Statements such as "Remember that day we worked on..." prompted the class to revisit, review, and reread text. Continual efforts were made to help students make connections between work done on and with the digital whiteboard and literacy activities done without the whiteboard (Lankshear & Snyder, 2000).

Student engagement, the digital whiteboard, and early literacy

The digital whiteboard was novel and created enthusiasm for learning. Students commented that their "fingers were magic" and "the board made the lesson work easier." Visual display in the form of diagrams, webs, and pictures, as well as use of colors and shapes to highlight text, prompted engagement. Reviewing text to identify phonemes and graphemes in word study, reading aloud, and modeling reading and writing strategies were facilitated through use of the digital whiteboard, which made manipulation of text fun and engaging work. Such activities helped to create meaningful links from activity to application and from activity to other reading and writing tasks in literacy instruction.

When I touched the board and manipulated text while modeling writing and reading behaviors in shared reading and guided writing (Dorn & Soffos, 2001; Fountas & Pinnell, 1996), my first-grade students were interested and contributed to the lesson. However, when students themselves manipulated text on the board, their enthusiasm increased, and they were immediately engaged in the lesson. This prompted me to use the board not only for whole-group lesson presentations but also for small-group and one-on-one instruction.

Students also were actively engaged in the preparation of slides with graphics and text to demonstrate their understanding of thematic material. These theme projects were shared with classmates and with parents. Students spoke about their
slides while touching the board to move to other slides.

Students viewed work done on and with the digital whiteboard as being fun. At the same time, they saw it as another learning tool. They made suggestions as to how text could be created with the board. They also began to use accurate terminology to describe menu items and graphics tools. When the board was bumped and needed to be "re-aligned" in order to correctly respond to movement on its surface, they recognized this and described it in a manner that reflected their understanding about the use and care of this technology. Respect for the technology was evident, but students also recognized its limitations when they wished to perform functions the board was unable to perform, such as retrieve text they had not saved or recognize marks they placed on the board when the board was out of alignment. The fun they had did not overpower their respect for the texts that were the result of their work with the board.

The board facilitates beginning reading instruction

This technology has much potential for early literacy instruction. For me it became an extension of my right arm, in that I was able to point at, rearrange, and re-create text quickly, while still maintaining good eye contact and communication with my students. This connection with students maintained their involvement in the lessons. The digital whiteboard let me prepare and present literacy lessons in a manner that allowed for easy navigation to lesson components. The board allowed use of multiple senses, leading to increased levels of engagement and greater understanding. Color and visual display drew attention to concepts about text and conventions of print. These advantages, as well as the ability to manipulate text, were all important considerations for me for use of the digital whiteboard. While all of these factors greatly influenced my enthusiasm for use of this technological tool, as a teacher of young children I continue to be cognizant of the need to vary activities, use authentic reading and writing materials and experiences, and incorporate movement and change of location. Play, art, music, and movement were necessary components of the new technology. In other words, while the board served as an extremely useful tool for literacy and language instruction, the developmental levels and thus the developmental needs of young children must be kept in mind.

In the future I will work to increase student engagement during literacy lessons through use of the board in small-group settings where students may more frequently respond to text through manipulation of it. It's important to keep the focus on literacy and language learning, and not on the tool. My goal is to model this through my attitude, words, and actions.

The process of learning to read is truly complex. As educators we continue to learn more about this process and to seek ways to help young children become successful readers and writers. Incorporating the digital whiteboard in our practice as a tool to teach early literacy skills may help us reach young children in many positive and powerful ways. The students' involvement with and demonstration of skills when the digital whiteboard is used may prompt continued use and research of this tool. As we persist in learning more about the reading process and effective instructional practices, this tool may assist young learners as they become excited and ever more proficient readers and writers.

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