**Interactive White Boards in the Classroom: What can they do? What should they do?**

**What are they doing?**

A Review of the Literature

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Classrooms in almost every new school being built today are equipped with some type of Interactive White Board. These IWBs are comprised of a large white touch screen and a mounted projector which are linked to a computer and driven through the manufacturer’s own software. These advanced systems are being installed as an upgrade to the dry erase board or the chalk board. IWBs are distinguishable from simple screen and projector systems because the board is engineered to function in the same way as a mouse pad. The computer is connected to both the IWB and the projector, so what appears on the computer monitor also appears on the IWB. The ability to operate the computer from the white board, (via a stylus, finger, or optical pointer) frees users from the computer terminal. This technology offers presenters a new way to interact with their audience.

Given the cost of these Interactive White Boards, it is important to determine their usefulness. What are the most effective uses of IWBs for classroom teachers? Do IWB’s improve student performance? These questions were evaluated using EBSCO and ERIC through the Kennesaw State University library as well as Google Scholar. “Interactive White Board,” and “Interactive White Board and Student Performance” were used in the search field. The research articles chosen have been categorized into three themes which form the organization for this literature review: Utility, Effectiveness, and Underutilization.

**Utility**

Brown (2003) lists the potential capabilities of Interactive White Boards. These include:

helping technologically challenged teachers create presentations; making it easy for teachers to enhance presentation content by easily integrating a wide range of material into a lesson, such as a picture from the internet, a graph from a spreadsheet or text from a Microsoft Word file, in addition to student and teacher annotations on these objects; allowing teachers to create easily and rapidly customized learning objects from a range of existing content and to adapt it to the needs of the class in real time; allowing learners to absorb information more easily; allowing learners to participate in group discussions by freeing them from note-taking; allowing learners to work collaboratively around a shared task or work area; and rapidly provide learner feedback.(p.1)

According to the literature everyone likes using Interactive White Boards. Most research supporting this is in the form of surveys and interviews of both students and teachers. For teachers IWBs offer “better classroom management, flexibility in handling the lesson materials e.g. modifying the materials, keeping the last-saved copies for re-use later, highlighting/zooming texts or pictures, access to and use of multimedia content, and better visual presentation.” (Sad & Ozhan, 2012, p. 1185) Students like the practical features and better visuals. In their survey research, Sad & Ozhan (2012) report that students “praised the practical functions like copy-pasting and recalling the previously displayed pages” (p. 1187). One elementary school child in their study even mentioned that he liked IWBs because chalk dust made him sick.

**Effectiveness**

In their extensive review of the literature on IWBs Smith, Higgins, Wall, & Miller (2005) categorize the potential benefits to teachers into themes. These included flexibility and versatility, multimedia/multimodal presentation, efficiency, supporting planning and the development of resources, modeling ICT skills, and interactivity and participation in lessons. IWBs support learning by motivation/affect and multimedia/multi-sensory presentation.

With all these benefits it makes sense to ask the question, “Do they work?” Unfortunately, the research in this area is sparse, and what empirical studies have been done are limited due to sampling problems and confounding errors. Marzano (2009) identified a positive link between IWBs and student performance. He described a targeted study in which 85 teachers taught two identical classes, one with an IWB and one without. Classes with the whiteboard showed a 16 percentile point gain in student achievement. He also identified positive links to student achievement with three common IWB features: student voting devices, graphics and other visuals to represent information, and reinforcer applications such as applause audio when a student correctly answers a question. Unfortunately he did not cite references supporting these gains. Mundy (2012) was able to show a positive link between student learning and IWBs. With some extensive research in seven school districts, he used a questionnaire and student data to conduct a study involving over 700 teachers and 16,000 kids. He was not able to control for all variables and warned of a “novelty” effect of the technology. Sad and Ozhan (2012) back up this novelty problem. They cite research that "revealed that the initial motivation aroused by this new technology can be weak and short lived" (p. 1185).

Further discrediting of IWB effectiveness, Torff & Tirotta (2009) looked at the relationship between IWBs and student motivation, or the “that’s so cool” factor (p. 382). They conducted survey research in elementary schools in New York City. Their method included surveying 32 teachers and 773 students, and they included a control group. Their findings suggest that IWBs increases student motivation, “but only by the slimmest of margins. Consequently, the IWB-is-motivating claim alone does not appear to serve as a suitable rationale for investments in IWB technology” (p. 383). Digregorio & Sobel-Lojeski (2010), mention a two year study by Higgins et al. (2007) that showed no significant difference in test scores between schools using IWBs and those not using IWBs. Beyond their effects on test scores, Kennewell, Tanner, Jones, & Beauchamp (2008) posit that, because they tend to be used in whole group settings, the use of IWBs “may be seen as a backward step, in that it gives a new impetus to traditional, teacher-centered approaches” (p. 71).

**Underutilization**

The final theme identified in the current literature review relates to how IWBs are being used in classrooms today. Overwhelmingly, it appears that whiteboards are not being utilized to their fullest potential. “It is interesting that neither teachers nor students carry out a great variety of activities on smart boards. The activities they conduct can also be carried out by the students through a combination of computer and projection and on blackboards.” (Gursul & Tozmaz, 2010, p.5736) In most cases, the research suggests that lack of technical competency, technical difficulties, and lack of training as the primary reasons for this underutilization. Sibel, Bilal, & Selçuk (2009) use a case study in Turkey to highlight the dangers of spending money on technology in schools but not following up with the necessary training to use it. In a related study, Gursul & Tozmaz (2010) preformed a case study at a school to determine student attitudes about technology. Their findings revealed that “technical problems” was by far what students liked least about IWBs. They didn’t specify weather “technical problems” referred to problems with the technology itself, or if it referred to their teacher’s technical deficiencies.

To ensure their full utilization, teacher training and support should be a priority for schools with IWBs. And, this training should come early because “if you don’t catch them (teachers) at the start, provide support, and show them how to use learning material, their enthusiasm quickly wanes.” (Smith, Higgins, Wall, & Miller, 2005, p. 98)

**Conclusions**

The title of this article was derived after reviewing the current literature. Answers to the three questions are as follows: IWBs have vast potential to enrich teacher lessons and support student learning. Even though IWBs have the capability to improve performance, there is compelling evidence that proves they do not. There may be a link between the underutilization of IWBs and their lack of effectiveness.

**Implications for Practice**

There is a need for high quality research into the effectiveness of interactive white boards. If it is proven that IWBs can positively affect student learning then school systems have an obligation to train teachers in how to best implement them. If it is determined that IWBs have negative or neutral effect on student performance then school districts should save their money or allocate spending elsewhere.

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