



SHELL
EDUCATION

Using

Interactive Whiteboards

in the
Classroom

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Foreword by Eric LeMoine

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Instructional Technology Coach and Trainer Eric LeMoine offers tips for implementing interactive whiteboards throughout this book.

Although I embraced many technologies as a classroom teacher in Beaverton, Oregon, my introduction to the world of the interactive whiteboard (IWB) came after I transitioned to a district-level position as a Teacher on Special Assignment in instructional technology. One of my responsibilities in that role was to pilot the introduction of IWBs in elementary, middle, and high schools throughout the district. The purpose of the pilot was twofold: to determine whether one IWB platform might work better for our classrooms than another, and to see for ourselves whether IWB technology brought any benefits to instruction. I took a rather atypical route to build my knowledge of the new technology—I purchased an interactive whiteboard and projector for my home, and then (much to my wife’s dismay) mounted it in our family room! This allowed me ample time to learn the technology and experiment with bringing curriculum to the IWB. I quickly realized that the IWB was a fun and engaging tool for both my children and their friends. But I also learned that the real challenge as a teacher was to bring meaningful and authentic *student-centered* experiences to the technology. It was all too easy to use the IWB as a glorified projection surface with the teacher operating the board most of the time. The difficult task is to build lessons and activities that foster student interaction with the board.

Some of the best arguments against the placement of interactive whiteboards into classrooms center around two facts: that many IWBs sit idly in classrooms without much, if any, use; and that IWBs become a teacher-centered tool with students mostly watching from their seats. However, in my current role as an instructional technology coach I have not only learned that professional development and ongoing modeling and support can ensure that IWBs are in constant use, but that the transition from a teacher-centered to a student-centered classroom is advanced by the use of IWB technology.

In this book, Kathleen Kopp provides many ideas to bring the student to the IWB. She also provides many simple yet powerful ways for the teacher to bring authentic, engaging tasks to the IWB that integrate classroom curricula. There are ideas for both the novice and more experienced IWB user. The topic of effective IWB lesson design is addressed with concrete, usable suggestions across the content areas. An entire chapter is dedicated to using the interactive whiteboard to differentiate instruction. Regardless of whether you are a classroom teacher, an on-site instructional technology coach, or a district-level administrator, there are useful ideas for you in this book.

Throughout the book, you will find *IWB Tips from an Expert*. These suggestions and tips come from my experiences as a technology coach in classrooms and from my opportunities as an international trainer and consultant in instructional technology. As I continue to consult as an IWB specialist, I realize that the true experts are the teachers and

students whom I have had the privilege of working with at schools across the United States and around the world. They have taught me so much about how interactive whiteboards can motivate, engage, and bring real-world learning experiences to the classroom. Kathleen Kopp has done the same thing for you throughout this book. Whether you are beginning or continuing your IWB journey, I am confident that your practice will be positively influenced by this book.

Happy Reading!

—Eric LeMoine, M.Ed.
Instructional Technology Coach
International Educational Trainer/Consultant

The Research Behind the Technology

Interactive whiteboards have been welcome additions to classrooms since 1991. This chapter explores the changing role of technology in our students' education, how interactive whiteboards contribute to a "sustainable classroom," and how initial research supports their use in highly effective classrooms.

Did You Know?

By 2009, nearly three million interactive whiteboards had been installed worldwide.

The Future Is Now

Today's classrooms do not look like those of just ten years ago. As advances in technology become more sophisticated and more readily accessible, students benefit from their use in everyday core subjects such as reading, language arts, mathematics, science, and social studies, and in elective courses, such as band, industrial arts, and visual art. States, school districts, and schools are in the midst of the digital age and are continuing to move forward. The Florida legislature passed a law in 2011 requiring school districts to use fifty percent of instructional materials dollars "for the purchase of electronic or digital materials on the state-adopted list by the 2015–16 school year" (Florida Department of Education, 2011). Schools are supplying students with electronic tablets for everyday use. Students at Clearwater High School in Florida had their textbooks replaced with eBook readers at the start of the 2010–2011 school year in an attempt to "integrate more technology with classroom instruction" (Catalanello 2010, 10th paragraph). Cushing Academy, a Boarding School in Ashburnham, Massachusetts, renovated its library in 2009. Included in the renovations, aside from the usual floors and furniture, was a complete replacement of its 20,000 or so text-based resources. Instead, students can access millions of digital books. This complete technological overhaul included flat-panel televisions in the media center, and e-readers and laptops for every student.

Indeed, the digital age is having a profound effect on our schools. While some schools embrace new technology and pave the way as models for other schools to follow, other schools use what electronic support they can from limited resources. Included in this technology wave is the use of the interactive whiteboard (IWB). Whether students each have a personal tablet or computer or the teacher is the only person in the classroom to have ready access to the digital world, an IWB is a viable instructional tool that teachers can use as part of an effective, technology-rich environment.

The use of interactive whiteboards has grown tremendously over the past several years. According to Corcoran (2009), the sales of SMART™ wall screens increased from 170,000 units in 2004 to 700,000 worldwide in 2009. Most of these sales were to schools.

With an increase of sales equal to about 400 percent over the past five years, it is clear that interactive-whiteboard technology is becoming a valuable asset to teachers and students. According to Futuresource Consulting, an independent global research company that has tracked IWB sales for over nine years, twenty percent of classrooms worldwide will have an interactive whiteboard by 2013 (CCP Interactive Blog 2011).

IWBs are part of a “sustainable classroom.” According to Educational Service District 112, a sustainable classroom is a “classroom technology integration model that utilizes a broad number of highly visual, interactive technologies with a single computer in order to support the nine instructional strategies that are identified in Marzano’s book, *Classroom Instruction that Works* [Marzano, Pickering, and Pollock 2001]” (2011, 2nd paragraph). Interactive whiteboards allow teachers to use technology as a natural part of instruction focused on highly effective instructional strategies. Since only one computer is needed to project software and programs onto the whiteboard, the financial burden of replacing technology is reduced. In addition, once a teacher is trained in the effective use of an interactive whiteboard (which includes ensuring that the IWB is not a teacher-centered tool), the teacher need only hone his or her skills or incorporate software updates as they become available. This reduces the need for specialized training in more advanced technologies. Finally, technical support needs are reduced to only those which support the technology already in the classroom. Since the interactive whiteboard is the mainstay of the instructional practice, technical support need address only the computer, projector, whiteboard, and software updates that are necessary for all the technology to work cohesively and fluidly.

Did You Know?

In 2009, almost one-third of K–12 classes in the United States and three-fourths of the schools in the United Kingdom had an interactive whiteboard.

What the Research Tells Us

Interactive-whiteboard technology has been around less than twenty years. Consequently, the research related to the use of interactive whiteboards is in its infancy when compared to other research on best practices in reading and mathematics instruction. A few researchers have published findings related to the use of IWBs in the classroom, but much of what is available for review is not yet found in peer-reviewed periodicals. All the same, when synthesized collectively, one underlying theme runs true: interactive whiteboards are an effective instructional tool capable of increasing student achievement, especially when integrated with pedagogically sound teaching strategies. In other words, a teacher cannot simply hook up an interactive whiteboard, use it sparingly or for only one function, and expect his or her students’ test scores to improve. As with any instructional tool, it is only as effective as the person using it. Therefore, research in this area includes qualifiable data related to instructional best practices, with the interactive whiteboard used effectively to enhance what has been established as sound instruction.

A review of the available research offers information related to several areas of

improved classroom performance: student achievement, instructional practices, and student behavior. Two benefits of IWB use are directly related to student outcomes. The third is related to improved instructional practice on the part of the teacher. Regardless of a teacher's motivation for using interactive whiteboards in the classroom setting, when used correctly and effectively, the students will benefit and the teacher will improve his or her own professional practices as well.

Improved Student Achievement

Classroom procedures, instructional materials, and supplemental resources may change at any time of year in today's classrooms. No matter what we bring in or throw out, the overall goal in education never changes: teachers want their students to be successful with the content. They want students to be confident learners and demonstrate their mastery of skills and understanding of concepts in some meaningful way. They want their students to be thoughtful, well-informed, and prepared individuals who are ready to tackle challenges, solve problems, learn from mistakes, and celebrate successes as they come. The effective use of interactive whiteboards can help students reach and exceed their educational objectives.

Recent studies regarding the use of interactive whiteboards in classrooms share similar results; overall, there is little statistically significant difference in achievement in English between students whose teachers use IWBs as part of their daily routine and those whose teachers do not use this technology to support instruction in this subject area. However, studies do suggest that the use of interactive whiteboards in mathematics does lead to statistically significant achievement gains (BECTA 2003; SMART 2006). This does not mean that interactive whiteboard use is ineffective in reading and language arts instruction. IWBs contribute to significant gains in achievement among students in fourth and fifth grades in both reading and mathematics, according to pre- and post-assessment of the Ohio Achievement Test (Swan, Schenker, and Kratcoski 2006). Additionally, the study discovered a link among third-through eighth-grade teachers between the frequency and complexity of a teacher's use of an interactive whiteboard and those who used it sparingly and for limited purposes. Teachers who used their IWB every day (or nearly every day) and for advanced interactive functions had students who scored above the mean on standardized assessments. Advanced functions included visualization of concepts and processes; problem solving; manipulation of figures, charts, and graphs; and the use of published and student-generated interactive math games.

IWB Tips

from an expert ∨

Student interaction with IWBs does not always have to be on an advanced level. Second-grade teachers have their students utilize the IWB as an independent station on a daily basis during Daily Five Word Work (Boushey and Moser 2006). One of the students' favorite activities during this time is a relatively simple one: Students are given a list of vocabulary words and are asked to re-create the words by

dragging existing letters from a letter bank. After forming each word, students write the word on the IWB with the pen. Although an IWB is not necessary for this type of activity, students are often more engaged when forming their words on the IWB as compared to the same activity without an IWB. They will usually complete more words when using the IWB and more consistently use these words in their subsequent writing activities.

These findings are supported by Somekh et al. in their *Report to the Department for Children, Schools, and Families*: “There is a consistent finding across all data that the length of time pupils have been taught with an interactive whiteboard is the major factor that leads to attainment gains” (2007, 3). They report measurable increases in student achievement in mathematics for both boys and girls who initially scored average or above average on national tests.

Marzano (2009) reports findings from a study that involved eighty-five teachers and 170 classrooms in which the teachers used interactive whiteboards to teach a set of lessons, which they then taught to a different group of students without using the technology. The study results indicated that in general, using interactive whiteboards resulted in a sixteen-percentile-point gain in student achievement.

While statistical data on student achievement associated with the use of an interactive whiteboard is limited, initial findings are encouraging, especially in the area of mathematics.

IWB Tips

from an expert ▼

The IWB works extremely well for teacher modeling of student tasks with subsequent student interaction. For example, to get students started when working on math problems with manipulatives, a third-grade teacher displayed a digital copy of the activity sheet and manipulatives on the IWB. He modeled two problems on the IWB, with students following along. When it was time for student independent practice, he invited a few students to complete the problems, using manipulatives, on the IWB while the rest continued at their seats. This also provided a nice forum for going over the problems once everyone was finished. Students exhibited more on-task behavior when starting, knowing that they might be chosen to work at the interactive whiteboard.

Changes in Pedagogy

Something less quantifiable in the realm of statistical analysis of student test scores is the overall “sense” that what a teacher does in his or her classroom makes a difference. Research does support the use of highly effective instructional strategies such as small-group guided reading, taking periodic “brain breaks,” and providing students with rigorous

and relevant instructional tasks. While the actual data supporting the use of interactive whiteboards as a means to improve student achievement is limited, research does show definitively that the use of an IWB as an instructional tool leads to more thoughtful, careful planning and instruction on the part of the teacher (BECTA 2003; Cogill 2008; Glover and Miller 2001). *Pedagogy* refers to the function or work of teaching. It reflects the art, science, or profession of teaching. It encompasses all the best strategies and techniques that the best teachers use every day to optimize student success. The research surrounding the use of IWBs leads one to conclude that the use of an interactive whiteboard is an effective means of reaching more students, keeping them engaged in learning, and providing regular intervals of interaction—all highly effective practices that improve instruction for even the best of teachers.

“Interactive whiteboards have great potential as a tool to enhance pedagogical practices in the classroom and ultimately improve student achievement. However, simply assuming that using this or any other technological tool can automatically enhance student achievement would be a mistake. As is the case with all powerful tools, teachers must use interactive whiteboards thoughtfully, in accordance with what we know about good classroom practice.”

—Marzano 2009, 82

Interactive whiteboards have several functions that support and enhance instructional best practices. These include voting tools (used for formative assessments), interactive functions that offer immediate feedback for students, and multimedia options, such as animation and video, that tap into students’ different learning modalities.

One sound instructional practice that IWBs support is the use of a student response system (SRS), or voting tool. These “clicker systems” are handheld devices that allow students to respond privately to a projected prompt, question, or problem. The questions can take the form of multiple-choice, yes/no, true/false, and depending on the hardware, short-answer and numerical input. A question is displayed on the screen, and students “click in” their answers using the handheld response device.

“After asking a question and getting student responses using voting devices, the teacher should typically discuss the correct answer along with the incorrect answers, making sure to elicit opinions from as many students as possible.”

—Marzano 2009, 82

Since student data are gathered and instantly available to the teacher, an SRS makes it easy to conduct *formative assessment*. Formative assessment has long been a highly effective practice for teachers (Stiggins 2007). Formative assessment is used throughout a unit of study as a means for the teacher to gauge whether students are on track to meet the objectives of the course content before they demonstrate their full understanding on an end-of-unit test or project-based measure. These types of assessments are not intended to

be graded; rather, they offer the teacher information about student learning so that the teacher can then support students (or accelerate them) as the learning process continues. The ease of use of the voting system in conjunction with the interactive whiteboard allows teachers to inform instruction regularly and without dramatically interfering with instructional time and instructional routines. In the midst of a lesson, the teacher can ask a question, immediately view student responses, and modify instruction in the moment. Since students can also view class results, they are often more open to further discussion or reteaching by the instructor. Most IWB systems have the voting software integrated, which allows the teacher to stay within a single computer application for instruction, assessment, and reteaching.

“Both student and teacher must know where the learner is now, how that compares to ultimate learning success, and how to close the gap between the two. Students must not be wondering if they will succeed—only when they will succeed. Obviously, this is the domain of day-to-day classroom assessment.”

—Stiggins 2007, 62

Similar to the use of handheld voting devices for immediate feedback is the use of an IWB for interactive practice and games. Graphics, animation, and audible feedback for correct and incorrect responses all contribute to the students’ ability to practice basic skills and attend to higher-order thinking tasks when activities are conducted on an interactive whiteboard. For example, students might drag and drop letters in blank spaces (l _ _ p) to make words. If they are correct, they might hear clapping or a bell. If they are wrong, the letter would pop back to its original place. Or, students might make predictions about what will happen during a science investigation and then receive immediate feedback (and an explanation) as to why their prediction was right or wrong. The game-like learning environment that an IWB provides and the immediate feedback keep students interested and motivated to practice more and learn more.

Another improvement in teacher pedagogy with interactive whiteboard use is the idea that teachers can move from one multimedia project or activity to the next with fluidity and purpose. For example, a science teacher introducing changes in Earth’s structure might begin by showing a picture of the Grand Canyon or other geological anomaly. After having a class discussion regarding how the land came to look the way it does, the teacher could lead the students directly to an online interactive activity related to changes in the earth and the length of time they take. Afterward, the teacher may have students pair up to discuss what they learned from the interactive game and then write in their science journals to predict how this information applies to the picture of the Grand Canyon. The teacher, using an IWB software function or a simple word-processing program, can record students’ ideas to use as a review at the start of science class the next day. All of these activities—the picture viewing, the online game, and the class-written record—can be performed instantly with the use of an IWB. Written work, review work, interactive games and activities, videos, pictures, audio files, and online resources may all be accessed and utilized easily, helping the teacher maintain his or her instructional pace, and thus maximizing the students’ instructional time during the school day.

An interactive whiteboard is a must-have for teachers who like to employ active learning strategies in their efforts to improve student achievement. When implemented effectively, an interactive whiteboard allows the teacher to provide engaging tasks for students, monitor the progress of students' skill acquisition easily and frequently, maintain the instructional pace, and develop content smoothly and productively throughout a lesson.

Changes in Student Behavior

One encouraging side effect of the use of interactive whiteboards as documented by both research and anecdotal evidence is the improvement of students' behavior in the classroom. Student-centered learning by nature is more engaging than teacher-centered instruction. Indeed, if students are engaged in their work, they are not engaged in acting out. Miller, Glover, and Averis (2004) noted in their study that use of IWBs shifts instruction from presentation to interaction and students' focus away from teachers and onto content, making interactive whiteboard lessons more student-centered than traditional ones.

Researchers and whiteboard users themselves state how the use of an IWB is a motivational instructional tool, one that captures and maintains the interest of students. Chad Lehman, Media Specialist and Technology Coordinator at Horace Mann Elementary School in West Allis, Wisconsin, noticed a "marked increase in student attentiveness and engagement" since his district began integrating interactive whiteboards into elementary classrooms (Teich 2009, 8th paragraph).

IWB Tips

from an expert ∨

IWBs can have a positive effect on motivation. Kindergarten students sit attentively longer when the teacher is modeling a concept on the IWB or when the students know that they have a turn to use the IWB in front of the class. Students pay attention, are motivated to show what they know or can do using the IWB, and are eager to offer assistance to classmates. Anyone who has taught kindergarten knows how hard it can be to keep the focus of 25 or more five-year-olds for more than just a few minutes!

One cause of student misbehavior is frustration with curriculum content and expectations that are either too challenging or too simple. With an IWB, a teacher can personalize practice problems so that students of all readiness levels have an opportunity to engage in the tasks at the board. For example, when working on double-digit addition problems, the teacher can include problems that require regrouping and others that do not. Knowing the readiness levels of his or her students, the teacher can assign appropriate problems to each student. Likewise, interactive whiteboards allow young students who have not yet mastered fine-motor development to demonstrate their understanding of skills through tapping and dragging objects on the board. This allows students to demonstrate their understanding of a particular skill or concept without the frustration associated with

writing. Reduced frustration and increased opportunities for success build students' confidence and keep them motivated to participate in the lesson.

IWB Tips

from an expert ▼

One kindergarten teacher's favorite IWB activity involves the skill of sequencing. Although many of her students cannot yet effectively communicate their understanding of a story through writing, they can retell the story by sequencing pictures. The students are very excited as they drag the pictures on the IWB into the proper order to show their understanding of the plot. This activity can be modeled with student involvement at the IWB, followed by independent practice with paper pictures at their tables.

“Educators can use digital resources while maintaining dynamic interaction with the entire class, provide computer-based learning without isolating students, and encourage a higher level of student interaction in both teacher-directed and group-based exchanges.”

—SMART™ Technologies 2006, 5

The use of an interactive whiteboard is motivating for students. However, McEntyre notes that simply having an interactive whiteboard in and of itself is not motivating; “[r]ather, increased motivation comes from giving students opportunities to interact with the whiteboard” (2006, 4). The use of an interactive whiteboard allows students to manipulate objects; write; type; insert objects, illustrations, and charts; engage in interactive websites; and perform a slew of other tasks, all in an effort to showcase their understanding in front of their peers. This, coupled with the “wow factor” that such an electronic device brings to the classroom, motivates students to pay attention to both the teacher and the students at the board and to participate more regularly in class.

When students are motivated, they attend school more regularly. Students also remain task-focused for longer periods of time, and outbursts and other defiant or disrespectful behaviors decrease. All these effects are directly caused by students being motivated to learn. Since putting IWB technology in the hands of properly trained teachers and staff members, the Jennings School District in St. Louis, Missouri, has noticed improvements in attendance, motivation, and behavior (SMART™ Technologies 2005). If the simple use of an interactive whiteboard is the root of this boost in students' motivation to learn, surely it is an educational tool worth utilizing on a daily basis.

Think About It!

Using an interactive whiteboard can reduce teacher stress by:

- Shortening prep time
- Simplifying resource sharing

- Reaching more students more effectively
- Offering greater flexibility in instructional sequencing and pacing
- Reducing overall anxiety

SMART™ Technologies 2009b

Recap: Using an Interactive Whiteboard

Classroom applications for using interactive whiteboards include:

- Multimedia lessons and presentations including audio and video
- Student- or teacher-centered use
- Collaborative problem solving
- Showcasing student projects and presentations
- Virtual field trips
- Recorded lessons that can be used by substitute teachers
- Formative assessment to immediately inform instruction
- Documentation of student achievement

Teich 2009

Into the Future

The ease of implementation of IWB technology and its integration into teaching practice is certain to increase in the future. Stansbury (2010) notes that new projectors can turn any wall into an IWB. These new projectors can project from short distances, making shadowing nonexistent, and can be adjusted to fit any space, large or small. This technology will be integral to the field of education for the foreseeable future.

Regardless of its make, model, and projection capabilities, an interactive whiteboard is an asset to any teacher's classroom. It helps students make gains in achievement; it helps good teachers engage their students in great lessons; and it turns monotonous work into interactive play, motivating students to want to participate and learn more. This is a wonderful technology tool for teachers!

Chapter Summary

While still relatively new on the education scene, initial research supports the implementation of interactive whiteboards for increased student engagement and achievement. They are also useful instructional tools to support effective teaching practices, and they can save time for teachers. Useful supportive technology, such as interactive software programs and hardware such as student response systems, only add to the overall interactivity of these devices. And, with increased student engagement comes decreased negative student behavior. Researchers have documented evidence to show that

effective use of interactive whiteboards benefits the academic and social growth and overall development of students across grade levels and disciplines.

Reflection Questions

1. Think about how research supports the use of an interactive whiteboard in the classroom setting. What do you most look forward to with regard to the use of an IWB?
2. Interactive whiteboards can be used to improve students' learning environment. How do you picture yourself using an IWB with your students? What is your vision?
3. Think back on a lesson you recently taught without the use of an interactive whiteboard. How might the use of an IWB have improved the instructional flow of the lesson, your students' understanding of the concepts or skills, or their level of engagement with the content?

The Basics of Interactive Whiteboards

This chapter introduces teachers to the five Ws of interactive whiteboard (IWB) technology: the *who*, *what*, *where*, *when*, and *why* of their utilization. The remaining chapters address the *how* of this valuable resource. By the end of this chapter, teachers should be able to reflect on their personal teaching environments and determine why an IWB is an essential piece of instructional technology.

What Are They?

Interactive whiteboards look a lot like the traditional whiteboards found in most classrooms, but they connect to a computer and projector. The computer's desktop is projected onto the whiteboard, where teachers and students can interact with the display. The user can write on the board with a special pen or stylus, and save and print the text on the screen. He or she can touch the board to move objects or perform any number of functions, just like using a computer mouse or touch screen. The user can insert captions, illustrations, clip art, photos, or links to any other instructional media. He or she can complete tables and charts, and insert graphs of the data they enter. In essence, the board does what the user tells it to do.

Many companies produce interactive whiteboards, and the technology advances quickly. The ideas presented in this book reflect the capabilities of IWB technology at the time of publication. Teachers should consider the ideas presented and adapt them to suit the technology available in their current classroom environments. Although teachers may have the most advanced high-tech equipment available to them—or, just the opposite, older IWBs with fewer features—the suggestions for use will help teachers utilize their technology for the ultimate classroom goal: improved instructional practices, increased student engagement, and greater gains in student achievement.

What Are They Not?

Interactive whiteboards are *not* glorified dry-erase boards. Dry-erase boards do not have the capability to interact with the person writing on them; they simply act as a canvas to record a person's words, ideas, or information. Then, with one swift swoop of an eraser, the information is gone. Interactive whiteboards, on the other hand, allow the writer to write or type text and then organize it, embellish it, emphasize it, revise it, edit it, and publish it—or save it, to return to at a later time. Anything that can be done with a computer program can be done on an interactive whiteboard.

Interactive whiteboards are also *not* simply large, bulky screens. Any teacher can project electronic media using a projector and a screen. This particular technology, however, does not allow for interaction with the user. When simply viewing material, students often sit passively absorbing information. They may be held accountable for the content through some form of written assignment or discussion, but the method of

delivery does not allow for active, engaging learning opportunities. Interactive classrooms require students to be moving, manipulating, discussing, recording, reflecting, and producing. All these best practices are possible—and easy—with the use of an interactive whiteboard.

Who Uses Them?

Lack Height? Sticky Fingers? No Problem!

If students are not tall enough to reach the top of the IWB with their fingers, use an extension device such as a rubber mallet, a pointer, or an eraser on the tip of a pencil to help students reach high places with confidence and precision. Or keep a small, safety-approved step stool or bench nearby to give students an additional boost.

If sticky or moist fingertips prevent students from dragging items on the board effectively, try a knuckle! A student's knuckle is usually cleaner and drier than a fingertip, and will often work much better. Or, use the eraser on the end of a pencil as a stylus instead.

One of the best features of interactive whiteboards is that students no longer need to be passive listeners and observers in the classroom. Now, they can engage themselves with the lesson, actively participate in class, reflect on their learning, and keep a permanent record of their ideas, all through the use of an interactive whiteboard. Teachers can use them in all classroom settings with students, from one-on-one tutorials to small-group instruction to whole-class demonstrations and lessons. Administrators can use them to conduct professional-development workshops, staff meetings, and presentations for parents. District-level administrators can use them to conduct executive meetings and deliver presentations to the school board or other public forums. Parents can use them during special school assemblies and to conduct PTA meetings. Anyone who projects information for the benefit of others can use an IWB. Interactive whiteboards are an effective presentation tool for any number of people in any number of situations.

Interactive whiteboards need not be reserved just for the classroom. Consider recently aired law-enforcement dramas on television. Investigators use high-tech equipment to pull up case histories, evidence that has been stored electronically, and suspect profiles. They use advanced interactive-whiteboard technology to enlarge, move, sort, and study facts and information relevant to their case. Imagine a classroom environment with entire walls that acted like interactive whiteboards!

Business professionals, too, can benefit from interactive-whiteboard technology. Managers, business leaders, and division representatives can use IWBs when meeting with employees or business teams. An IWB set up in a conference room allows the presenter to move away from dull, one-dimensional slide shows and into more vitalized presentations which include the ability to demonstrate new processes and procedures, show videos, review data, and record ideas. According to IBC Systems, SMART™ Technologies offers

business-minded hardware and software especially suited to “bring everyone into one room—regardless of location—to share ideas, work on documents, and focus efforts on common goals” (2011, under Business Solutions). They have information specific to a wide range of businesses, from architecture, engineering, and construction to telecommunications.

As much as businesses can benefit from interactive-whiteboard technology, so too can community organizations. Community leaders meet with organizational teams, conduct public forums, or make presentations to elected officials.

Some IWB manufacturers also provide specific hardware and software solutions for those who work in government settings. They offer ideas and methods for interactive presentations, distance collaboration, and effective training. These apply to government workers in general, military personnel, and public safety officials.

In fact, anyone who shares or discusses information with small groups of people can improve his or her presentation by using an interactive whiteboard.

Recap: People Who Use Interactive Whiteboards

Interactive whiteboards are beneficial devices for:

- Teachers
- College professors
- Administrators
- Professional-development presenters
- Students
- Parents
- Business leaders
- Community leaders
- Government workers

Where Are They Most Useful?

Interactive whiteboards are useful teaching devices. However, like all devices, they have their limitations. Interactive whiteboards are most useful in small spaces, such as a classroom or a conference room. They would not be suitable for whole-school assemblies in gymnasiums or during large-scale presentations in an auditorium. Interactive whiteboards measure about the size of a standard classroom projector screen. Most auditoriums have projection systems that are much larger than this. So, a whiteboard system would be too small in this type of setting.

Besides the general education classroom, an IWB can serve teachers and students in many other locations around a school building. A media specialist can use IWB technology in the media center to teach students about multimedia tools, research skills, or any other media-related topics.

IWB Tips

from an expert ✓

Media specialists often use their IWBs when working with students on research skills. Using the simple annotation capabilities of the IWB over nonfiction text (from a Web page, a PDF file, or a digital textbook), they can highlight, circle, or underline headings, pertinent facts, or supporting details. They can then switch from the nonfiction text to a blank screen and model how to take notes on the information presented. Inviting volunteers to the IWB to demonstrate their knowledge is very engaging for the students!

Technology teachers, of course, can use IWB technology in their instructional setting for modeling or practicing usage of search engines, software applications, or technology features of published curriculum. Special education or Title I resource classrooms especially benefit from the use of IWB technology. Typically, these students benefit from multimodal, interactive, and engaging instruction. The use of an IWB is an effective instructional tool to help reach these specific learners and their individual needs. (For information on how to use an IWB to differentiate instruction, see [Chapter 7](#).)

IWB Tips

from an expert ✓

Our resource teachers work with specialneeds students and use their IWBs to engage students in ways not possible without the technology. One lead resource teacher emphatically stated, “Before we had our IWB, I had three students who would not attend to an instructional setting under any circumstance. When we started to use the IWB (using pictures of the students in the class for various sorting activities), those three students enthusiastically participated and later showed transfer of the concepts! They’ll now go to the board on their own—even when the projector is off!”

Administrators might want to install an IWB in a conference room for use during workshops or meetings. A music teacher could use an interactive whiteboard in a music room to engage his or her students more fully in lessons. Any setting in which instructors or presenters want learners or audience members to actively engage in their lessons or presentations is a good place for an interactive whiteboard.

Did You Know?

A solar-powered interactive whiteboard is bringing this instructional technology to students in a part of Africa where there is little electricity.

PR Newswire 2011

When Should They Be Used?

Think about the number of transitions that occur within a single lesson. Consider the following situation: Mrs. Hill is a highly effective teacher. She uses multiple approaches to reach students of all readiness levels during her mathematics instruction. She is adept at managing her lessons. She is concise and precise in her teaching. She strategically utilizes various instructional tools such as manipulatives, interactive software, and individual student dry-erase boards to introduce, teach, practice, and evaluate students' success with content. Unfortunately, Mrs. Hill loses valuable instructional time moving from one tool to the next. First, she introduces the class to a new topic with a short video clip that she streams from the Internet. This requires her projector and screen, which covers her board. She must also run the video from behind her desk, where her computer must remain in order for it to connect to the projector. She believes in illustrating ideas with real-world applications such as the one on the video, but she dislikes feeling so isolated from her class. She is not a "behind-the-desk" kind of teacher.

Once the movie is done, Mrs. Hill adjusts the setting on her projector to read her document camera. She hands out the student manipulatives, regains everyone's attention, and then demonstrates the concept from the video with hands-on experiences. Again, Mrs. Hill likes modeling what students' materials should look like using the manipulatives under the document camera, but she is still separated from her students since the document camera, too, is beside her desk. Once the class has practiced the concept using manipulatives, they move to abstract problems. For this, Mrs. Hill must roll up her screen and turn off her projector. The students put their manipulatives away and pull out their individual whiteboards. As Mrs. Hill demonstrates how to work through problems on the board, the students practice at their seats with their individual whiteboards. When they turn their boards toward Mrs. Hill, she can check students' understanding of the concept.

Next, students take out their math textbooks. The students who are not clear on the procedures gather together around Mrs. Hill's work table. While others in the class work independently, Mrs. Hill conducts a small-group lesson, using a portable chart-paper stand and markers to demonstrate the concept further as the students around her work in their books.

How many transitions take place in the scene described above? They involve computer, document camera, whiteboard, desk work, and small groups. Every time Mrs. Hill moves from one task to the next, she loses instructional time in the transition. Also, she was physically distanced from her students for much of the lesson. She could not easily oversee her students' independent work because she had to run her instruction from behind her computer and document camera. These routines could be more smoothly connected if Mrs. Hill had an interactive whiteboard in her classroom. With an IWB, she could run the video, open an online manipulative website (which the students also could manipulate at the board), write on an IWB blank page, and pull up an electronic version of the math text to model procedures. Additionally, Mrs. Hill could gather her small group around the IWB and use it to teach her follow-up lesson. Mrs. Hill's dynamic lesson would be that much more effective were she to utilize interactive-whiteboard technology. She would have the benefit of being close to the students, and she would have the option of calling on students

to demonstrate processes—a much more engaging instructional strategy than simply showing projected images.

Imagine the fluidity of an entire day following the structure an IWB provides in the classroom. This example shares one lesson on one day in one mathematics class. But, the idea holds true for any instructional setting in any subject area at any time during the school day.

IWB Tips

from an expert ∨

Although it required some preparation time up front, a third-grade teacher placed all the student math pages (provided in PDF format by the publisher) in the IWB software (in this case, SMART Notebook™) for use in his math lessons for the whole year. This allowed him and his students to use the IWB throughout entire math lessons. From instruction to modeling to guided and then independent practice, the teacher and students interacted with the IWB, which brought increased engagement and understanding to the lesson.

Why Should They Be Used?

Interactive whiteboards offer much more than traditional whiteboards. Writing (or word processing) is not the only action they can perform; IWBs are a valuable instructional tool that allows the teacher to instruct and monitor students without being locked behind a piece of furniture. They allow students to maintain a high level of engagement with the teacher and therefore the content. The teacher and his or her students can both be up and moving, acting as integral participants in the lesson rather than passive learners. Interactive whiteboards keep the teacher (or more importantly, the students) at center stage, with the focus on content and process with few interruptions as a lesson moves fluidly from one task to the next.

From the Trenches

“I discovered I have very little need now for my document camera. When I want to do simple math practice problems with the class, I open a word processing program, then use the pen tools to write on the interactive whiteboard. My IWB makes practice so easy. And, I am not stuck beside my document camera to demonstrate mathematical processes.”

—Tabetha Harrison, Third-Grade Teacher

Likewise, students with varied learning styles require different types of instructional strategies. For instance, students who are kinesthetic learners benefit greatly from being able to actively touch and manipulate the items projected on the board. Kinesthetic learners learn best by doing, experiencing, touching, moving, or being active in some way.

Jensen (2008) links physical activity to positive effects on the brain, and suggests that teachers plan activities that have a built-in component of physical movement. The use of an IWB naturally provides for active learning. Students with poor fine-motor coordination may feel empowered and confident as they use gross-motor skills to interact with the board. Teachers frequently utilize text and pictures, models, projection screens, computers, film and video, multi-image media, color highlighting, organizing information, imagery, and graphic organizers to stimulate reasoning and learning for students with disabilities. Logsdon reminds us that “[m]ost students, with a disability or not, enjoy the engaging variety that multisensory techniques can offer” (accessed 2011). The use of an interactive whiteboard provides teachers with meaningful, relevant, and engaging work that benefits their students with disabilities as well as their general education students.

Consider this science situation: In a traditional classroom, students learn from a lesson in their textbook. They read factual information, using pictures and other visuals and their captions to support the content. The teacher asks questions, and the students answer them. After reading about the content, students complete a graphic organizer to summarize the information and then answer comprehension questions. If a teacher uses electronic media to present information, he or she does so from one computer, to which the students generally do not have access. So, the teacher winds up being the one to manipulate or demonstrate the projected images. In a classroom with an interactive whiteboard, however, the lesson becomes much more active. The teacher can project the text on the screen and invite students to circle, underline, or highlight the important information, which the students can then use immediately to complete the graphic organizer. Or, the teacher can pull up a digital copy of the graphic organizer and toggle between the text and worksheet to model how to find and record important information. The students, although not using the board themselves, have an immediate visual that they can use to continue working independently. Or, the teacher can hand over the highlighter to the students, and they can, in turn, come to the board to show the class where the most important information is on the page. When the teacher pulls up an electronic interactive activity, the students can be the ones to move, sort, tap, and “play,” instead of the teacher. Additionally, after the teacher is done modeling the graphic organizer on the IWB and directs the students to complete their paper versions at their desks, he or she can invite a pair of students to finish their graphic organizer on the IWB. In this situation, the IWB transforms a science lesson from a “sit and get” to an interactive, engaging learning process in which the students “run the show” with the teacher’s guidance.

Finally, the use of an interactive whiteboard engages learners through activity, interaction, and, most importantly, immediate feedback. Brookhart describes effective feedback as that which “contains information students can use.” For example, when learning basic facts or simple skills (such as identifying nouns or sequencing events), students “need immediate information about whether an answer is right or wrong” (2008, 55). Interaction with an IWB provides the instant feedback students need to learn new skills.

Recap: Why Use an Interactive Whiteboard?

- Present instructional material more fluidly

- Maintain proximity to students
- Offer students ready access to large-scale, interactive instructional programs and manipulatives
- Provide immediate feedback for students
- Improve students' focus on lesson content

Chapter Summary

This chapter should have teachers excited about using interactive-whiteboard technology with their students. If anyone is new to the IWB community, welcome! This technology is proven to bring engaging learning to students. For veteran IWB users looking for new ideas to refresh and revitalize their use of an IWB, the next chapters should offer some innovative ideas.

Reflection Questions

1. After reading about the *who*, *what*, *where*, *when*, and *why* of IWBs, how do you see an interactive whiteboard in your classroom benefiting both your lesson presentation and the students you teach?
2. Think about a student in your class who needs specialized instructional strategies to help him or her learn. How can the use of an IWB support his or her learning, as well as enhance the learning of other students in your classroom?

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