

Interactive whiteboards enhance project-based learning

By Heather Ellwood

“What will we discover today?”

Patricia Deibert asks this every morning when she arrives at her classroom and powers up her SMART Board[™] interactive whiteboard. A biology and chemistry teacher at Sheboygan Falls High School in Wisconsin’s Sheboygan Falls, Deibert says her students’ understanding of some very difficult scientific concepts is enhanced through hands-on learning projects facilitated by SMART products.

She explains that with Notebook[™] collaborative learning software and the SMART Board interactive whiteboard, her senior biology students become “so engaged in their ability to manipulate objects, like transcribing DNA into messenger RNA, and explaining and demonstrating the process to their peers, that often learning just happens. Those aha moments give me all the incentive I need to keep facilitating learning opportunities on the interactive whiteboard for my students.”

One project saw her students conducting a genetics symposium. After much research and exploration, they transformed themselves into scientists with knowledge of specific genetic disorders. The SMART Board interactive whiteboard acted as the central research hub for their investigations. At project’s end, the students presented their scientific talk using the board.

Learning from projects

These examples of project-based learning certainly make excellent use of interactive whiteboard technology, believes Jane Krauss, an Oregon-based educator, speaker, facilitator and author. With Suzie Boss, she recently co-authored the book *Reinventing Project Based Learning: Your Field Guide to Real-World Projects in the Digital Age*. The book follows the arc of a project from initial stages through to assessment and reflection, and is filled with real-life examples of successful projects from around the world that use technology as a key component.

Krauss explains that project-based learning (PBL) takes a multi-subject, cross-curricular approach and builds a framework for students to connect ideas. Rather than teachers strictly acting as the purveyors of knowledge and information (although such pedagogy does occasionally play a role in PBL), they most often become facilitators and integrators. In this type of scenario, as Deibert’s biology students can attest to, the interactive whiteboard plays an integral role.

When Jeanne Dillon, a sixth- and seventh-grade, language arts and math special education and resource teacher at Holcomb Bridge Middle School in Alpharetta, Georgia, has her students work through projects using the SMART Board interactive whiteboard, they are far more eager and willing to share ideas and collaborate than they were with a simple pencil and paper. She believes such an approach makes academic success possible for her students, all of whom have behavioral and learning disabilities.



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Sheboygan Falls High School,
Sheboygan Falls, Wisconsin



An eighth-grade student in Jeanne Dillon's reading class shares his "me" project.

Dillon thinks teachers have to be willing to create opportunities with the interactive technology to facilitate higher learning skills. "As a teacher, you have to believe in technology to really see the power of the interactive whiteboard. Once you see the power of a SMART Board and are willing to spend the time building collaboration and interactivity into your lessons and projects, you will see so many chances for your students to do so many amazing things," she says.

In Dillon's reading class, her eight students create all-about-me projects in either Notebook or PowerPoint software and include graphics, personal writing and audio clips on their likes, dislikes, special memories and personal slogans. The primary focus is on honing their writing skills and improving their organizational abilities as they take these projects from start to finish. Because of the small class size, Dillon is able to give her students the time and space they need during a project for individual practice and for finding resources, such as specific learning objects using the interactive whiteboard. The students finish their projects by leading the learning and sharing their presentations – also on the board. Such sharing, Dillon says, "honors their work and shows them that what they do is valuable and valued."

SMART opportunities

PBL expert Jane Krauss believes using interactive whiteboards for presentations, such as those in Dillon's and Deibert's classrooms, are only one way they can enhance project-based learning. "One of the basic premises of project-based learning is to make your ideas visible and discussable," she explains. "Using an interactive whiteboard does that. It also makes ideas malleable. One example is concept mapping around a central idea. An interactive whiteboard means ideas can be shifted, manipulated and moved around. Everyone can contribute and very easily see their contributions made visual," Krauss adds.

The interactive whiteboard becomes a location for a visual representation of the thinking that went into a project, or in other words, a place to collect ideas. Krauss explains, "Project-based learning is often about the persistence of ideas, building on these ideas and then evaluating them. Students are asked to reflect on their own thinking, and when you make their thinking visual by using the interactive whiteboard to record their ideas and thoughts on a concept, they can very easily reflect back upon it. You have a snapshot of their thinking at that particular time."

Design is another crucial element of PBL, says Krauss, especially in terms of the interconnectedness of the various aspects of a project and the creation process that occurs. Some projects may also

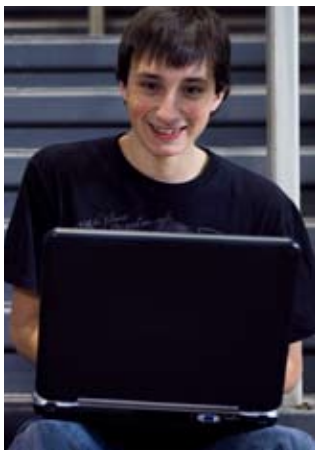


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Jane Krauss,
Teacher and author of
Reinventing Project-Based Learning,
Eugene, Oregon



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Students are actively engaged in Jeanne Dillon's reading class.

incorporate graphic or architectural design elements. All of these utilize the interactive whiteboard's unique visual properties.

Deibert's students used graphic elements adeptly when they studied bacterial pathogens and created wanted posters incorporating all the crimes and misdemeanors attributed to their particular bacterial villain. Built in Notebook software and including design elements, each student presented their poster on the SMART Board interactive whiteboard and expanded on the unique characteristics of the pathogen with the tap of a finger. With learning structured in this manner, the spotlight turned away from Deibert and onto the students. When students meet specific benchmarks by creating their own content and demonstrating their knowledge in this way, it builds learners who are responsible, believes Deibert.

Yielding the stage

PBL teachers, explains Krauss, must be willing to facilitate student-driven learning opportunities and, like Dillon and Deibert, generate those opportunities. Deibert echoes Dillon, saying the onus is on her to create student-driven lessons throughout the duration of projects that are infused with the technology students are so adept at using. “Teachers need to remember that most of us have learned technology as a foreign language while our students have grown up in a bilingual environment.... Facilitating interactive opportunities and then yielding the stage can garner so much from our students,” she explains.

Krauss agrees but adds that in her experience, teachers often find it difficult to teach in a way they never learned, either as children in school or at the postsecondary level. They may not be aware of the wonderful learning opportunities that result from taking on a facilitator-teacher role. This role can begin, Krauss believes, with the interactive whiteboard. She says, “In my opinion, interactive whiteboards have become part of the basic set of classroom technology in so many North American schools, so the opportunity is there for teachers to easily make the shift.”

Using an interactive whiteboard in a way that fully utilizes its many capabilities, like creating a student-centered, project-based learning environment, takes practice and perseverance. A report from the University of Technology in Sydney, Australia, “Exploring Pedagogy with Interactive Whiteboards,” found that once teachers have had the opportunity to work with interactive technology for months, often as long as a year or two, they begin to make the fundamental shift

from relying on whole-class teaching, to using the interactive whiteboard in the manner of Deibert and Dillon – supporting interactive learning opportunities, with the teacher acting as co-learner.

The report states that if teachers consider using interactive whiteboards to provide new ways of learning and teaching, as Krauss advises, and make a shift to a pedagogy that might be unfamiliar to them, the interactive whiteboard becomes a far more valuable resource.

A United Kingdom report, commissioned by the British Educational Communications and Technology Agency (Becta) and conducted by researchers at Manchester Metropolitan University, had similar findings. Becta discovered that after two years of sustained experience with an interactive whiteboard, teachers were able to change their practices to make best use of its functions.

Exploring interactivity

That change of practice or shift might need only one small project using the interactive whiteboard, maintains Krauss. Bill Kanzinger, a teacher at Cape Fear Academy in Wilmington, North Carolina, found this out when his first-grade students explored space. They took on a project centered on NASA's space shuttle program. Using the SMART Board interactive whiteboard, Kanzinger's students watched a video of the latest launch and then explored the international space station by accessing a virtual tour on the multimedia section of NASA's website.

By taking such voyages, Kanzinger has found the SMART Board interactive whiteboard facilitates a strong connection between his students and the curriculum, taking them outside the confines of the classroom. Using the board as a large-screen, interactive portal takes full advantage of all the educational opportunities the Internet has to offer, including bringing experts in any field right into the classroom, such as the astronauts on the space shuttle. Having easy access to experts, Krauss explains, is an integral and vital part of good project-based learning.

Kanzinger has found that when he uses the interactive whiteboard to facilitate and present content, his students stay focused longer. "Because they are more attentive, students leave the lesson with greater comprehension than if I were teaching without the SMART Board," he adds.

He tries to find new ways to weave interactivity into his lessons, giving his students every opportunity to manipulate objects on the board. This, says Krauss, is the way to create a student-focused classroom.

"Teachers must be brave enough to make that jump into a way of teaching that removes the static. By using the interactive whiteboard, they can make learning dynamic and visual," advises Krauss.

Not only will learning be dynamic and visual, but it will help build those 21st-century high-level learning skills that are much valued, such as communication, problem solving, persistence, trouble shooting and arbitration. The learning will also excite and energize students and take them far beyond the surface of the content.

In answer to Deibert's question, "What will we discover today?" With project-based learning and a SMART Board interactive whiteboard, our students Journey of discovery has no limits.



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Wilmington, North Carolina