Move over, laptops. As 1-to-1 computing becomes the goal on K-12 campuses, school districts are turning to this newer, pen-based technology.
MOBILE COMPUTING at Saint Mary’s School, an all-girls school in Raleigh, NC, used to be a consistently disruptive endeavor. Students would saunter into class, pull out their laptops, flip open the screens, and settle at their desks behind a wall of technology. Sure, this wall was giving the students the latest and greatest in technology. But at the same time, it was fencing them off from a connection with their teacher, a key interaction in the learning process. Performance plummeted. Teachers bristled. Then, finally, last year, the school discovered a brand-new way of approaching 1-to-1 computing: pen-based tablet PCs.
A LARGER PURPOSE
HOW ONE SCHOOL IS USING TABLET COMPUTING TO CONNECT FAMILIES SEPARATED BY WAR.

San Onofre Elementary School (CA) is made up almost exclusively of families affiliated with Camp Pendleton, a US Air Force base. Throughout the fighting in Iraq, many students have been separated from their parents for extended periods of time. Rather than be handcuffed by these circumstances, school officials have embraced them, investing in technology to enable students to communicate with their parents overseas. At the heart of the effort is the school’s 1-to-1 computing program, which puts a tablet PC in the hands of every student.

In anticipation of the recent end-of-year holidays, for example, second- and third-grade teacher Cris Branker commissioned her students to compose holiday poems by writing out verse on their tablets. Next, she had the kids stand at the front of the classroom and read their poems aloud. Branker stood in the back of the room with a digital video camera, recording each poem. Finally, with her students’ help, she compiled the readings into a CD-ROM videography, and used military mail to send dozens of copies of the disk out to parents in time for Christmas.

“IT was a neat thing for parents who are far away to have a holiday connection with children,” says Branker. “For the kids, sending personal holiday greetings was really special, too, and none of it could have happened without the tablets.”

Within weeks, the school’s new Lenovo ThinkPad X41 tablet PCs (www.lenovo.com) had transformed the way Saint Mary’s teachers did their jobs. Teachers created outlines for each class, projected those outlines onto a screen, and used tablet technology to scribble down notes on the file while lecturing. After class, the teachers saved the notes to a Web server for anyone to access. Suddenly, Saint Mary’s 275 female students were getting enthused about technology. Originally, the school planned to refresh the entire laptop program with tablets by 2007. Now, however, Director of Technology Jessica Sepke says she’ll work to replace all the laptops by the end of this coming year—an unprecedented rollout in terms of time to market.

“Our teachers are excited about using [tablets] in the classroom, so we want to roll them out as quickly as possible,” Sepke says of the school’s change in plans. “As a technologist, when you’re dealing with a rush job brought about by overwhelming user satisfaction, believe me when I say it’s the kind of challenge you want to have.”

Saint Mary’s isn’t the only K-12 school district to build its 1-to-1 computing program around tablet technology; over the last few years, a number of other districts have also chosen tablets as the basis of a 1-to-1 initiative. In many cases, this new take on mobile computing serves as a supplement to the old and trusty laptops. In others, particularly those like Saint Mary’s, technologists are relying upon tablet technology to replace laptops altogether, sending the flip-up screen the way of the Dodo bird and the joystick.

Tablets At Work
At San Onofre Elementary School in San Clemente, CA, the transforming effects of tablet technology are apparent in the classroom of third-grade teacher Heather Sherer. Sherer has streamlined her math lessons by giving students the option of working through problems on their tablets instead of on paper. With the help of OneNote software from Microsoft (www.microsoft.com), Sherer has students write out problems on their tablet screens and e-mail them to her. She says the approach cuts down on paper and makes it easier for her to evaluate all the students in a class at once.

San Onofre Principal Barbara Barnes hails additional benefits of Sherer’s tablet technique, as well as the advantages of tablet computing in general. For years, the district had Apple (www.apple.com) desktop computers that took up far too much space in the classroom. Now, Barnes says, thanks to a 1-to-1 computing program that matches every student with a tablet PC from Toshiba (www.toshiba.com), San Onofre students have their desks completely free of clutter, and can utilize the tablets in whatever way they wish. She admits that perhaps the biggest challenge was training teachers to use the new equipment. Once staff members overcame this hurdle, however, the new technology became a huge hit among students and educators alike.

“Tablets are just so much easier to use, write on, and take notes on,” Barnes says. “Now the biggest challenge we have is to figure out how to buy more.”

A Grand Vision
Technologists at Cabrillo High School in Lompoc, CA, have had no trouble figuring out how to buy more tablets. As part of an overarching 1-to-1 computing effort, the school recently invested in wireless carts stacked with tablet PCs for students to use in each of their classes. The impetus for this strategy was the success Cabrillo teachers saw in a “learning-
1-to-1 computing

by-doing” approach to biology through a local aquarium. Building on this success, they set out to find bigger, bolder ways to apply similar hands-on, collaborative principles toward other aspects of the curriculum.

One area where the school has made strides is math. Back in 2003, David Schroeder set out to help his fellow Cabrillo math teachers keep students on track and engaged in their algebra lessons. Schroeder investigated a number of technologies. Finally, he settled on tablet PCs and new software from DyKnow (www.dyknow.com), called DyKnow Vision.

The DyKnow Vision system is essentially a client-server application. The solution transfers information between teacher and student using standard Internet protocols over a traditional computer network. On the back end, a Microsoft SQL Server serves as the storehouse for DyKnow Vision documents saved on the system. Because the DyKnow system utilizes user-based profiles, students are able to use any PC in their school. Schroeder says the technology has enabled him to make the learning environment in mathematics as interactive as it is in science. What’s more, he says, student learning has improved too.

“The challenge with math classes is to get students to participate,” Schroeder says. “My premise was that if I could get students to practice more class material in front of me, in an environment where I could immediately respond to a larger number of students, then they would learn more.”

Schroeder implemented Cabrillo’s cart-based tablet computing solution during the fall semester of 2004. He first used the technology to transmit his handwriting, text, images, and Web content to each student’s computer. Once the material was transmitted to their machines, students were able to use the electronic pens adjoined to the tablet technology to annotate the material however they saw fit. According to Schroeder, the tablets fostered in-class interaction through onscreen, two-way communication. He says the system also afforded students the opportunity to deconstruct and replay class material as they first received it, step by step.

The results were powerful. The year before Schroeder introduced DyKnow Vision, the final-exam average for students in his Math II course was 72 percent. The following year, with the help of DyKnow Vision and the tablet PCs, the average score on the very same test shot up to 82 percent. Moving forward, Schroeder says he’s retouching his lesson plans to make the most of the new technology. Dave Berque, creator of the DyKnow software and a professor of computer science at DePauw University (IN), says this change in thinking is exactly what tablet computing programs should inspire.

“Most teachers want students to focus on content, not on input,” he says. “Tablet technology is a great way to do this.”

Private Practice

Tablets have yielded similar transformations at a number of private schools across the country. At the Rocky Hill School in East Greenwich, RI, for instance, teachers are deploying the technology in a 1-to-1 setting designed to maximize student-directed discovery. The school’s pedagogical model revolves around the Harkness table—an oval table for no more than 12 students. With the help of the M4 and Portege tablets from Toshiba, students can sit around the table and compose notes, utilize a wireless projector to present work publicly, or access information from the Internet.

According to Stephen Farley, director of studies, Rocky Hill’s adoption of tablets resulted from a negative experience with laptop computers. The flip-up screens of laptops became barriers to education around the Harkness table, miniature walls that stood in the way of collaborative learning. Farley says that laptops afforded students the chance to use instant messaging, e-mail, and dozens of other applications that are contrary to productivity. With tablet technology, however, teachers now can ensure that everyone around the table is focused on a task, and working together to get it done.
1-to-1 computing

"Tablet computing has opened up a whole new way of communicating that’s personal and effective and diverse," says Farley, noting that the more expensive of the two Toshiba models is still less than $2,400. "With it, I can be face-to-face with my kids at all times."

Tablets at Rocky Hill were first introduced as an elective component of the school’s mandatory 1-to-1 laptop program (every student must purchase a laptop computer before his first day). Last year, given the choice by school officials, 18 out of 31 members of the class of 2008 opted for tablets over laptops. This year, tablets again were the preferred option, purchased by 24 out of 44 students in the class of 2009. Next year, Farley says, tablets will be mandatory, meaning that by 2010 every student in Rocky Hill School will be using a tablet computer.

The plan at the Kent School in Kent, CT, is even more aggressive: By the end of next year, all 564 students will be required to use tablet technology. Adam Fischer, director of Information Services and Technologies, says tablets have been optional at Kent since 2003, when the school first included the technology in its 1-to-1 laptop program. Today, the school supports three different kinds of tablets: two TravelMate300 models from Acer (www.acer.com), and a convertible model from Hewlett-Packard (www.hp.com). All three sell for less than $2,300.

The change that tablet technology has brought to the learning process at Kent is unmistakable. Students can take notes on their machines with the electronic pen, and teachers can review those notes without ever physically handling any paper. Still, Fischer says, very few of the school’s tablets are used in a vacuum. Most Kent teachers build their lesson plans around presentations that incorporate the tablet and an LCD projector. As teachers present a lesson, they use the pen-based tablet to scribble notes on PowerPoint slides, and the projector sends this dynamic image to a screen at the front of the room.

"One of my teachers calls [the mix of tablet and projector] the ‘dynamic duo’," Fischer says. "If you want to explain something on the slide, you can. Need to go back a few slides to clarify a point? You can do that, too."

After class, teachers post their entire set of slides on the school’s Web site, where students can access the slides or download them for further review. If a teacher doesn’t post the lecture notes immediately, students complain.

Fischer says that students at Kent have embraced tablet computing to such a degree that they expect teachers to make tablets the focal point of every lesson. At a time when many students would rather fiddle with their Xbox than do their homework, the tablet—and the knowledge-thirsting culture it has spawned—is one huge step on the road toward an educational promised land. THE

To compare tablet PCs, see p. 28 >>

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TALKIN’ ABOUT TABLETS

An upcoming laptop conference will put the focus on this compelling technology.

IN 2003, WHEN OFFICIALS planned the first-ever Laptop Institute conference for K-12 technology coordinators, they named it after the preeminent teaching tool of the time: laptops. Today, however, organizers might as well rename the event the "Tablet Institute" conference, since so much of it will center on tablet PCs.

The annual event, held this year from July 16 to 19 at the Lausanne Collegiate School in Memphis, will feature 30 informational and best-practice sessions geared toward teachers, technology integrators, technology support staff, and technology administrators. According to Lonnie Jackson, who is organizing the conference, a good number of these talks will focus on tablets and how the software districts can use them.

"The tablet PC certainly is compelling technology," she says. "Last year, one company loaned out a tablet for an attendee to use, and other attendees were ignoring the talks so they could lean over and see what was going on with the tablet.'"

This year, attendees won’t have to be so sly. Jackson says the conference will take a look at the laptops of the future, and that many speakers will speak about tablets as a viable alternative. In addition, the event will boast a tablet-only mini-lab with technology from Gateway (www.gateway.com), as well as a number of sessions focused on hardware and software by DylKnow (www.dylknow.com).

For more information about the conference, visit www.laptopinstitute.com.

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