WIRED LEARNING

Computerized classrooms are redefining education **BY ERICKA CHICKOWSKI**

WALK INTO MR. JOHNSON'S CLASSROOM, AND IT'S HARD TO TELL EXACTLY WHERE THE FRONT OF THE ROOM IS. THERE ARE NO LINES OF DESKS FACING A CHALKBOARD, NO PODIUM FROM WHICH TO LECTURE. INSTEAD, DESKS CIRCLE THE ROOM IN BUNCHES OF FOUR. RATHER THAN ADDRESSING THE CLASS AS A WHOLE, JOHNSON BUZZES AROUND, HELPING STUDENTS ONE BY ONE WITH VARYING PROJECTS. IN FRONT OF EACH IS A SCREEN AND A KEYBOARD, BUT THIS IS NO computer lab. Mr. Johnson teaches arts and humanities at Lemon Grove Middle School. This is the classroom of the future.

"When you walk into these rooms, it is a totally different learning environment than in the past," says Darryl LaGace, beaming. As director of information systems for Lemon Grove Schools, he's made it possible for every student in the room to have a computer. "It lends itself for the teacher to work in small groups and from the student standpoint, it puts them more in charge of their own learning."

Across the country, administrators such as LaGace are changing the way kids are learning. Rather than relegating computers to isolated labs, educators are bringing these machines into the classroom. And instead of simply teaching kids about computers, more teachers are using them as regular tools to teach traditional subjects.

One of eight schools in the Lemon Grove School District, Lemon Grove Middle School is in the community of Lemon Grove, a small town located on the outskirts of San Diego. With a very diverse popuation, this working-class community doesn't fit the stereotype of the privileged suburb. And more than 69 percent of the students are eligible for reduced or free lunches.

And yet, without endless coffers to draw from, the district has managed to develop one of the most technologically advanced programs in the country. There is a computer terminal for every two children per classroom. And for students such as those in Mr. Johnson's class, there is a computer for every child in the classroom. These kids are part of Lemon Grove's latest technological experiment, a program that tests the effectiveness of one-to-one computing—essentially one computer for every student.

Several hundred students are currently enrolled in the program, which gives them full-time access to a specially made tablet computer. There was no special requisite to join the program, so these are students of all abilities. The only requirement was an agreement to take responsibility for the tablet and a willingness to use it every day.

It is clear that these kids are excited about the work they do. One student, Alyxis, all but falls off her chair to show off the features of her tablet.

"I'll show you," she says excitedly.

She's got all the Microsoft Office productivity tools at her disposal, along with a Web portal that links her and her parents to real-time information about her attendance and grades. (This information can also be checked by parents on any other computer.) She also has access to class Websites for each of her periods, developed by teachers to lay out coursework and background materials for classes. And she has access to the Web publishing software that she and the other students use to post their work to each of their class Websites. Through a program sponsored by Cox Communications, all students are provided Internet access at home. Rather than turning in traditional paper homework, they upload their work directly to the teacher.

"There's no 'the dog ate my homework' excuses anymore," Alyxis laments jokingly.

Students aren't the only ones loving the program. Just down the hallway is Samantha Swann's math and science class.

Today she is giving a pop quiz to test her students' understanding of the recent week's chapter in math. As the students answer each question on their screen, Swann monitors their progress on her own terminal. On her screen is a display that tells her in real time how her students are doing on the test. She can tell at a glance who has mastered the subject and who needs a little extra help. Those who breeze through are given materials to continue on while she helps the rest of the students.

"I love this system," Swann says. "If they take it away, it would be like taking away one of my arms."

COMPUTERS ARE NOT NEW to the field of education. Several decades ago, students were being introduced to punch-card programming, BASIC and FORTRAN. But these kids were the Bill Gates and the Paul Allens of the world. They were lucky enough to have access to computers and smart enough to enroll

in the optional learning programs that introduced them to these machines, along with the early opportunity that they provided.

As computing in education progressed into the '80s and '90s, the focus shifted from developing software to learning how to use the latest applications. At the time, the goal was to get kids into computer labs, learning how to operate word-processing and spreadsheet applications, but rarely were computers being used as tools to enhance education in traditional subjects such as reading or math. Part of this was because there simply weren't the resources to bring enough computers into the classroom to affect day-to-day curriculum.

In addition, many teachers had little experience or training in using computers in the learning process. Only recently have educators recognized the importance of integrating computing into classes. With the proliferation of valuable online teaching resources, it became apparent that children needed not only to gain information about the world but also to know how to find information in their digital world. Now it is less about kids learning the technology and more about using the technology to learn.

"Of course we hope to improve students' tech skills," says Marianne Zito, assistant superintendent of instructional services for the Schaumburg 54 School District. "But more importantly, we are concentrating on 21st century skills that support student learning and are aligned with workplace skills."

Zito's Chicago-area district recently began a three-year program that equipped its fourth-, fifth- and sixth-graders with laptops for a one-to-one computing environment.

"For us, it's not about the publicity or the glamour of the technology," Zito says. "They need to be able to find information quickly and be able to identify it as reliable or not."

Provided these skills, students are able to improve their abilities in nonfiction reading and writing. Zito says that with the abundant resources available online, students are able to find more, better and more-current information about the topics covered in textbooks.

"We are seeing significant increases in the amount of writing and the amount of note-keeping these students are doing," she says. "They research things more thoroughly."

It is also giving students more opportunities to communicate their work to fellow students and the world outside of school. For example, a group of her students recently finished a short documentary on Egypt that is now airing on the local public-access television channel.

"The laptop has also become a wonderful communication tool between generations," Zito says. "Students take it home, open the laptop and show parents what they've learned. This gives parents more insight into their childrens' education. But it also teaches their parents some of the tech skills themselves. A lot of parents are learning along with their children."

COURTESY: SCHAUMBURG 54 SCHOOL DISTRICT

One-to-one computing in the Schaumburg 54 School District has improved reading and writing.

THE THEME OF TECHNOLOGY aiding traditional learning is prevalent among schools with a high ratio of computers to students. According to independent research done by San Francisco–based Rockman Et Al, these laptop students have consistently outperformed their non-laptop peers in all areas of writing assessment. More than 80 percent of teachers of laptop-using students interviewed by Rockman have reported that their students are exploring topics on their own and working on long projects. And 90 percent of these teachers use activities that empower students to teach each other, rather than relying solely on the teacher for direction.

At Catlin Gabel School in Portland, students in grades nine through 12 are proof of the benefits of a laptop program. Three years ago, upper-school head Emily Jones helped bring laptop computing to Catlin Gabel. Since then, it has helped improve the way the school teaches to all students.

"It allows us to teach in much more sophisticated ways that include different teaching methods for different kinds of learners," Jones says. She explains that multimedia learning allows students to see a topic reviewed dynamically, rather than just watching a teacher scribble on a blackboard. "There are lots of things that you can do when you have constant access to the information available online," she says. "For example, rather than having teachers try to draw meiosis on the blackboard, they can actually have students watch the process of cells splitting on their monitors."

While Jones admits the transition to laptop computing was not completely trouble-free, she does credit laptop pioneer schools for helping her staff when they made the switch.

When Catlin Gabel instituted its program three years ago, it received guidance from Cincinnati Country Day School, a leader in one-to-one computing. One example of how the school is leading the way is an art project in which students use computers to become part of a masterpiece. Students search online for images of classic paintings such as the *Mona Lisa*; they then create a *tableau vivant*, posing as if they were the model and digitally photographing the pose. Then, using photo-manipulation tools in Photoshop, they seamlessly graft pictures of themselves into the actual artwork.

"It epitomizes the kind of integration you want to see in education," says Joe Hofmeister, who oversees the program at Cincinnati Country Day School. "It is not for technology's sake. It is technology to serve learning. The kids are using digital cameras, the Internet, Photoshop and word processing, but in the end, it is all about the art. My feeling is that they are never going to forget those pictures that they were actually a part of."

EXAMPLES SUCH AS THESE DON'T SURPRISE Dan Wolfson in the least. As technology program manager for the San Diego School District, Wolfson thinks that technology is changing the way kids think.

"The idea is that technology with good teaching engages kids at a higher level," Wolfson says, explaining that with today's fast access to information, kids now operate in a "fast-twitch" environment. They need only to have a sudden twitch of curiosity and initiative in order to find new information. He believes that it is now the responsibility of educators to adapt so that they can facilitate learning and thinking in this new environment. "We want students to think critically, to understand how to access and communicate information," he says. "We want to move away from strictly teaching rote information."

However, most school districts are far from installing the one-to-one computing environments found at schools such as Lemon Grove. In most cases there is just not enough money to provide every student with the technology. The San Diego School District, for example, operates more than 200 schools with more than 8,000 teachers and more than 125,000 students in class each day. The logistics are not there yet to provide computers to every student, Wolfson says. But that doesn't mean they can't equip each teacher with technology tools. Wolfson and his staff are assisting with a district initiative to convert more San Diego classrooms into "digital classrooms."

Teachers will have access to laptops, and classrooms are being outfitted with wireless Internet and special projectors so teachers can present online information to the entire class. Each classroom has at least a few computers for individual work, and the district is also providing mobile computing carts equipped with laptops so that teachers can provide a computer to each student during specific periods. On top of this, the district is encouraging teachers to create class Websites, similar to Lemon Grove's sites.

These techniques sound familiar to Dion Yahoudy. As manager of technology asset development for the Bellevue School District near Seattle, Yahoudy oversees a lot of curriculum decisions involving technology. Like San Diego schools, Bellevue schools are incorporating laptop carts, along with in-class technology to aid instruction. One of Yahoudy's pet projects is the introduction of Smart Boards, computerized marker boards that record everything that the teacher writes during the lesson. These notes can be projected onto a screen for students during class and can also be uploaded to teachers' sites so that students can review them after class.

But Yahoudy says that, while the school district has a technology program to be proud of, she almost likes to downplay the actual assets at hand.

"You are not going to see us talk about the hardware," she says. "It isn't about competing with other schools, boasting that we have x number of computers per student. What we care about is curriculum."

She explains that as the education community moves forward with its technology integration, it needs to be cognizant of the fact that computers can't automate education. "There is a place for technology," Yahoudy says. "Then there is a place for the human touch that only the teacher can provide."

And she hopes that teachers and administrators will not let the lure of technology's bells and whistles distract from the solid foundations.

"For example, a student can produce a PowerPoint presentation with phenomenal slides but no guts to the report," she says. "We are trying to produce kids who are educated and can use tools, but we are not going to focus on using tools."

Wolfson agrees.

"The bottom line is that students have to achieve," he says. "When we bring technology in, we ask, 'Is this going to help them with that?' "

As with anything in education, there are challenges presented with the integration of computers in the classroom. For example, many wonder if computers will make it easier to cheat in the classroom or to plagiarize from Internet materials. However, Hofmeister and many others believe these issues are something that can easily be dealt with.

"The cheating business is blown all out of proportion," he says. "If you are giving a test that is so easy to cheat on, then you probably need to make a better test. And as for getting original work, any English teacher worth their salt will immediately detect significant plagiarism when a kid brings in something that doesn't look anything like their past essays."

As teachers deal with these growing pains, they may find that technology can help in the academic honesty arena as well. For example, at Bellevue's Sammamish High School, advanced-placement English students turn in essays electronically via an online application called TurnItIn. This device compares student work with a wide database of articles in periodicals, encyclopedias and other resources to ensure that there is no matching text. If there is a match, the program alerts the teacher of suspected plagiarism, including the percentage of matched verbiage and a link to the suspected original source.

Another sore spot that comes up with one-to-one computing is the topic of distraction. If students are busy surfing the Web rather than listening to a teacher, what good are the computers, really?

"The answer basically is that the teacher has to up his or her game," says Hofmeister. "Computers didn't invent distraction. Kids used to play games in class that just used their hands. And if worse comes to worst and you need them to listen at a certain point, you just have them close their laptops." ▲

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