



WIRED

FOR SUCCESS

Schools Using More Technology to Educate Students

Technology in the classroom is no longer novel or cutting edge. Many educators say it's a necessity to better educate America's students.

By Laura Coleman

“I’d say to policymakers, when it comes to making America strong, when it comes to making sure America has the people to make sure we are the country we are today, to have a quality public education, they need to be like Nike and just do it to make sure schools have the money they need.”

—Reg Weaver, president
National Education Association



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aren Gill, a physics teacher with 16 years experience, is charged with a difficult task: to teach, challenge and motivate a class of high school students.

To help her in her task, Gill’s physics lab provides a unique setting at Henry Clay High School, which has 1,900 students and is located in Lexington,

Ky. Her classroom is equipped with innovative technology to help engage students, keep them active in classes, enhance their performance, and allow them to collect very accurate data.

“Henry Clay is a fairly typical school,” said Greg Drake, coordinator of Instructional Technology for Fayette County Public Schools. “Karen’s class is technology rich, but isn’t typical of this school.”

On a day this fall, for example, Gill’s class used Classroom Performance Systems (CPS) to “vote” on the accuracy of their peers’ in-class presentations. These “clickers,” as the students call them, act as remote controls similar to the remotes audience members use on the television show, “Who Wants to Be a Millionaire.” The students’ votes then were projected from their remotes to a television at the front of the classroom.

“The kids are using the clickers in class today,” said Gill. “They have analyzed some data and are presenting their information. The class will then ask questions about the data the presenters presented and I’ll try not to give away whether or not their presentations are correct—and the class will then offer feedback to fix everything.”

Students listen to their peers’ presentations and ask questions to correct miscalculations and inaccurate data. Then, the clickers—the class votes on whether to accept or reject the final presentation. The accuracy of their votes makes up a portion of each student’s class participation grade for the day. And if the critics in the crowd vote not to accept their classmates’ final pre-

sentation and calculations, they must have questioned the part they consider incorrect.

How did Henry Clay High afford these smart remotes? It didn’t.

“I wrote a grant to get those CPS systems,” said Gill. “It took about six hours ... It wasn’t that bad.”

“But that’s a high demand on teachers, given the other responsibilities they have,” Drake interjected.

Using Technology in the Classroom

High-tech clickers aren’t the only new technology tool teachers find useful. Software and programs, equipment like laptops and virtual school systems are only a few technologies teachers use to enhance students’ classroom experiences.

Software and Programs

Software created specifically for educators can enhance a student’s experience in nearly every facet of a learning environment. Software programs are available that can help teachers identify a student’s weaknesses in content areas, generate tests and practice problems specific to the areas where they need improvement and automatically alert parents if their children are in danger, among a myriad of other tasks.

Gill uses several Web-based systems for students’ assignments. One of those programs is WebHomework, a free service through the University of Texas. It assigns all students the same problems, but uses different numbers for each student to decrease temptation to share answers.

Fayette County Public Schools has also begun a partnership with the UCLA IMMEX (Interactive Multi Media Exercises) Project, sponsored by the National Science Foundation. The Web-based IMMEX software provides students with problem scenarios and requires them to use problem-solving skills that

Challenges in Classroom Technology

Bill Thomas, director of the Southern Regional Education Board, listed some issues policymakers should be aware of when considering technology programs for schools in their states:

- Technology is costly.
- Technology changes rapidly.
- Schools have problems supporting technology, and
- Training for teachers, an absolute necessity, is often neglected.

Jeff Mao, coordinator of Educational Technology for the Maine Department of Education, echoed Thomas' sentiments about the need for training.

"Whether or not a teacher knows how to use the technology is crucial," he said. "If a laptop becomes a five pound paperweight, you run into issues. Is the leadership providing support and resources for adequate training and is it demanding that teachers use technology and attend the training? If not, it's the same as making a kid carry around an eight pound math book without using it."

Replacing outdated equipment is another essential. "An old computer sitting in a room is completely useless and can be counter-productive," said Ransom Holbrook, school technology coordinator for Hayes Middle School in Lexington, Ky. "If we buy stuff for schools, we think it should last forever instead of treating it the way we treat a business."

But while updates, training, and equipment can be cost-prohibitive, Mao points out that, as in the case of Maine's 1:1 laptop program, an entire state has a lot more buying power than a school district.

"The price we've negotiated," he said, for computers, networks, technical support and training, "I would bet is better than what every other district in the country is able to get."

integrate concepts with real-life situations. IMMEX problems provide students the resources to develop, test and refine their hypotheses to arrive at solutions to complex problems. It also has a unique assessment component that allows teachers to evaluate student content knowledge and reasoning skills by using the search path maps the software generates.

"My kids call IMMEX WebHomework on steroids," said Gill. "It's a context rich problem where they have to make decisions and judge what information is essential to solving the problem. It's not quite as difficult as the real world, but you take a step closer to what the real world is."

Just down the road from Henry Clay High School at the three-year-old Edythe J. Hayes Middle School, 800 middle school students report to their classrooms five days a week. And if they don't, their parents know about it automatically.

Hayes Middle School educators use student attendance software to track and record attendance. The software then allows teachers to generate an attendance report and letters to other staff members and parents by using the attendance data. It also integrates with telephone software to automatically call absent students' parents.

Sherri Jo Heise, the school's principal, said parents appreciate this kind of notification. "They expect us to have it," she said. "If a child is absent, it makes an automatic call home. It helps keep them in check."

"The main thing is keeping that child safe," she said. "It goes beyond the learning. It keeps the child safe, too."

Computers and Hardware

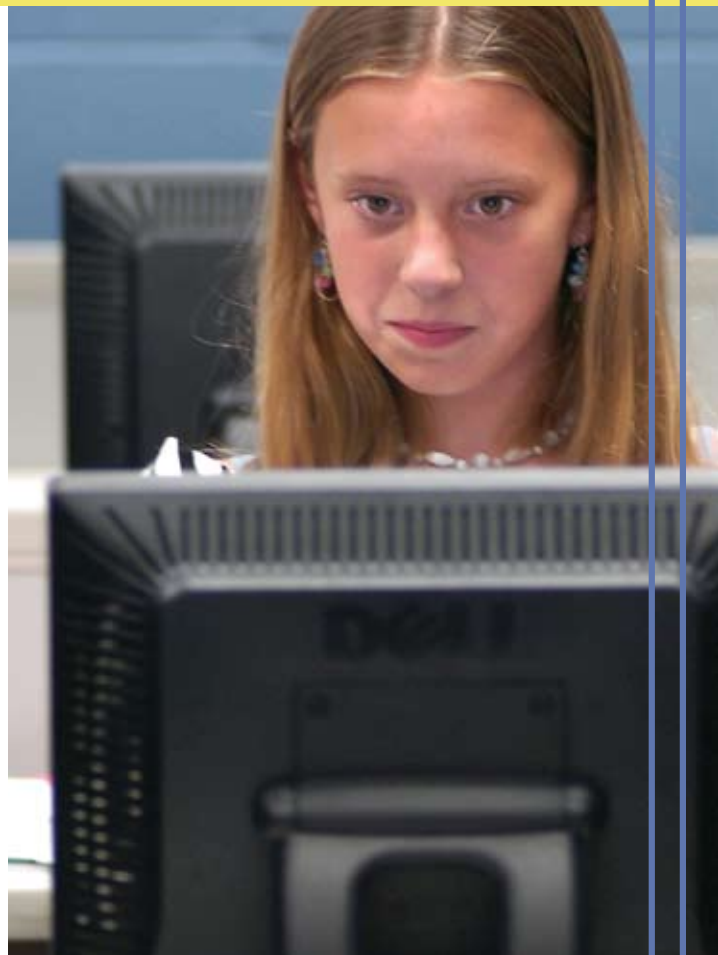
Many school systems realize how necessary it is to make sure students have access to up-to-date, functional computers and Internet availability, which will help equip them with skills they need in the 21st century.

In one unique case, however, an entire state committed itself to this goal. The Maine Learning Technology Initiative, a four-year-old program, has equipped more than 32,000 seventh and eighth graders and 4,000 teachers with Apple notebook computers, wireless networks, training and technical support.

"The project in general is trying to look at how we teach and how kids learn and how technology can be used to enhance that process," said Jeff Mao, coordinator of Educational Technology for the Maine Department of Education. "The real core of what we're trying to do and where most of our attention goes is teacher training and to produce best practices."

"It gets a lot of attention, the fact that we've spent so much money on all this equipment," he said. "But that's not the reason we did this, not to teach kids computer skills. The kids will gain computer skills simply by playing with a computer. We tried to figure out how as an English teacher, you can reach your goals, not if every kid knows how to make a PowerPoint."

Former Maine Gov. Angus King took initial steps toward the project in 1999. "Governor King is very charismatic," said Mao. "He deeply cares about the state, and when he latched on to the idea, he was able to move a crowd and bring people along."



According to Mao, the initiative was born through the governor's desire to move Maine ahead of other states in terms of economic development. "He realized in talking to other governors that if we did the same things other states were doing, we'd stay where we were ranked," said Mao. "To make a change, we must think beyond the simple things."

Mao said King then spoke with professional location specialists—people who advise companies where to open—and asked them what motivated companies to locate to certain areas.

"The number one thing was the able and ready work force," said Mao. "You can always deal with taxes, there are plenty of locations that are near enough to transportation so you can get supplies, but if you don't have an educated work force, you end up spending an enormous amount of money to bring one in or educate one. If the work force already exists somewhere, you can plop the factory down there and let them go."

While it was King who initiated the project, he could not have taken it on alone. "I think what it takes in the end is significant political will at the legislative level. Schools alone can't do what we're doing—there's just not enough money in the traditional school formula," said Mao.

And Maine's legislature made sure school districts didn't have to go it alone. "In the end, if you strip everything away, someone has to pay for this. This is state funded," said Mao. "The legislature supported the project, listened to constituents, decided it was a good program and when it came time to put their thumbs up or down, they put their thumbs up."

To Mao, this initiative helps level the educational playing field. "I think one of the things to look at or consider is that we often talk in state government about equity and serving the population," he said. "When we look at how schools are funded, we say it's equitable, but it's a separate but equal kind of equitable. In a school district, the funding formula gives fewer dollars per head to richer districts than to those which are economically depressed. This makes sense.

"But on the other hand, we look at how our project was deployed, and it was a different kind of equity," he said. "Every student and every teacher was given the device and training. It gets all the way down to the classroom level."

Virtual Schools

Where laptops grant access to computer equipment to students who may not have it at home, virtual schools can help increase accessibility to classes and teachers some students would not normally be able to experience.

"The number one advantage to virtual schools is that they provide courses irrespective of where students reside," said Bill

Continued on page 32



Virtual Schools

The SREB in 2002 released a report on considerations for planning a state virtual school. According to the report, states should:

- Establish the state's vision: The Web offers value and opportunities to increase students' access to quality education and to improve student achievement.
- Identify which courses are needed: Budget shortages that limit the number of qualified teachers in certain subject areas, intensified by high student enrollments and high turnover among new teachers creates new accessibility challenges that can be remedied by offering Web-based courses.
- Organize actions to meet state needs: What administrative structure will be required to manage the delivery of courses, coordinate activities, and assess the quality of courses and effectiveness of the program? To create a virtual school, a state must determine what courses will be available and how to measure quality.
- Determine cost and funding methods: The Kentucky Virtual High School offers online courses to school districts, which pay \$275 for one-half credit and \$500 for a two-semester course. Florida's legislature provides its state's virtual school with sufficient funding so any student in the state may take courses at no cost to the student or the school.

More considerations and information on virtual schools, as well as case studies and examples of best practices, are available at www.sreb.org.



State of Decay continued from pg 14

health care for seniors is an important issue especially for those with lower incomes. “In Arkansas, the median income is well below the national average,” Roebuck says. “Medicaid in Arkansas does not cover adult dental care, not even for relief of pain, which is ludicrous.”

“If we could get the impetus to try to include some adult dental care in Medicaid (it would be an important first step),” Roebuck says. But he acknowledges that it “would take a pretty good effort to get that passed.”

Oral Health Links for Your Constituents: Help Connect Senior Citizens With Expert Advice

This CDC fact sheet on oral health for older Americans provides easy-to-follow advice on how to prevent oral health problems. Link your constituents to the fact sheet at www.cdc.gov/OralHealth/factsheets/adult-older.htm

For answers to questions about oral cancer, direct constituents to this CDC Web page: www.cdc.gov/OralHealth/topics/cancer.htm

The American Dental Association’s “Your Oral Health” Web page offers useful information for the general public about a wide range oral health topics. Link to this page at www.ada.org/public/index.asp.

“A lot of other groups want that money also,” he explained.

“It would be good for the general health of these patients to receive these services. If you let it go, it gets worse. If we don’t get it early, it’s going to get worse, no question about it.”

At the national level, advocates for dental care have been championing legislation to require states to provide more oral health services to seniors either through the Medicaid program or by adding dental benefits to Medicare. So far, Congress hasn’t taken action.

Rogers, from Oral Health America, however, sees some positive signs for the future, too.

“Health insurance companies are detecting and noticing the links” between providing preventive dental care for seniors and saving on more expensive treatment for preventable oral health problems, Rogers said. “I’d say within the next three to five years, you’ll see a lot more research that will show why and how it pays to address the health care needs of seniors early. That will help legislators defend dental care programs for seniors.”

—Dan Lorentz is editor of *Healthy States Quarterly*, a publication of the Healthy States Initiative.

Wired for Success continued from pg 22

Thomas, director of the Southern Regional Education Board. “They can be used to fill gaps in curricula, whether it is with Advanced Placement courses, core subjects or things people refer to as electives.”

Thomas said 12 of the 16 SREB states already provide Web-based courses, with Florida leading the pack. Florida’s program began in 1997, and this year alone, more than 40,000 high school student are taking online courses. The program is funded by the state.

“Schools only get money from the state if a student has successfully completed the course,” said Thomas, noting that Florida requires that students pass the class.

Success rates in Florida range from 90 to 92 percent. Of the 137 students who took Advanced Placement courses through Florida’s virtual school in 2000–2001, more than half earned scores of 4 or 5—on a five-point scale—on the exams. About 65 percent of the students earned scores of 3 or higher—beating the national average of 61 percent.

“We see these programs as good economics,” said Thomas. “Why should everybody create all courses? Once online courses are developed, teachers can teach the same course and make copies of it. You could have five or 50 algebra teachers teaching that course.”

The best part of virtual schools, said Thomas, is that the programs are closely monitored no matter where the students are. “Rural kids or inner city kids who have never had access to a quality teacher can have a nationally board certified teacher,” he said.

‘Just Do It’

To Reg Weaver, president of the National Education Association, it’s as simple as this: If education is a top priority, policymakers have to provide for better technology in the classroom.

“When America decides something is important, they find the money,” said Weaver. “I’d say to policymakers, when it comes to making America strong, when it comes to making sure America has the people to make sure we are the country we are today, to have a quality public education, they need to be like Nike and just do it to make sure schools have the money they need.”

—Laura Coleman is the associate editor of *State News magazine*.

