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Rethinking Computers in the Classroom

Obama wants more PCs for kids, and Harvey Milk Academy is one school doing just that. But a 21st-century, computer-focused curriculum is the real challenge

By [Aaron Ricadela](#)

Three fourth-graders sit around a computer in one corner of a classroom at Harvey Milk Civil Rights Academy, a school of 220 students in San Francisco. One 9-year-old boy dons headphones to take his turn with the machine, reading passages from a virtual storybook as an animated panda cavorts on the screen. When he stumbles over words, voice-recognition software from IBM cues him to give it another try. After all the kids finish, the computer gives teachers a report on the students' progress, down to the letter combinations that throw them most often.

This may be a scene from the future of U.S. education. But Harvey Milk is no cutting-edge institution. The school is trying to reintroduce computers into its classrooms after a failed experiment with PCs a decade ago. The school once had plenty of computers and a dedicated technology lab, but a shortage of funds and lack of trained computing staff put an end to the effort. Today, the lab room is used for storage, piled high with boxes. "We've lost money over the years," says Sande Leigh, the school's principal.

Leigh is now trying to scare up funds to finance another effort to integrate computers into classrooms. The school bought PCs, literally at a fire sale, and plans to outfit its 11 classrooms with them early next year. She hopes to install IBM's [\(IBM\) Reading Companion](#) on enough systems to accommodate 44 kids at a time, though she's counting on a grant from IBM to cover the \$10,000 cost of the software.

SHORT OF FUNDS AND FACULTY

Leigh's experience is an example of what educators say is ailing computer programs in U.S. classrooms. Schools are enthusiastic about the technology's promise, but short of the money and trained faculty to extract many of its benefits. The debate over the efficacy of PCs in schools is gaining new charge as President-elect Barack Obama proposes [new federal spending](#) to outfit classrooms with computers and wire schools for Internet access as [part of his economic stimulus plan](#).

In many schools, PCs have failed to aid students' learning or improve test scores, or equip them with the analysis and communications skills that today's workplace demands, according to studies. The problems include a reliance on paper lesson plans that don't factor in technology, and inadequate teacher training and technical support. Also at fault, say educators, is American classrooms' occupation with teaching kids strategies for raising standardized test scores to meet provisions of the No Child Left Behind Act.

That often leaves little room for creative extras. Other times, school boards buy computers to prove their technical savvy to politicians and parents, without thinking through how kids will actually use the machines. "Any school that focuses on putting more computers in the classroom as their core goal will undermine the transformation that technology can provide," says Anthony Salcito, Microsoft's general manager for U.S. education.

A NEW APPROACH IN TEXAS

Now, bolstered by the prospect of new spending on school technology programs, educators are exploring new ways to weave the computer skills seen as essential to this century's workforce into children's daily lessons. "What's exciting about the Obama plan is not just the money," says Elliot Soloway, a computer science professor at the University of Michigan who studies the effect of technology in education. "He's going to help schools rethink what the kids do on a day-in, day-out basis." Giving more kids Internet access could compel teachers to switch from asking students to Google for answers to questions, to assigning more involved research projects, Soloway says.

Some school districts are already trying new approaches. The Keller (Tex.) school district in January plans to start outfitting students with smartphones, which provide basic computing functions and can cost as little as \$100 a year per student. Keller's pilot will equip 55 students with smartphones featuring slide-out keyboards from Taiwanese vendor [HTC](#), with data service supplied by Verizon Communications ([VZ](#)), according to Soloway, who's working with the district on its plan. In February, Detroit's University Preparatory Academy plans to start a similar smartphone test. "It's all going to be through the phone. That's where the opportunity is now," says Soloway.

At the High Tech High charter schools in the San Diego area, students keep a "digital portfolio" of their work online, collecting writing, art, and other projects on the school's Web site, which is publicly available. The projects help kids produce "real products for a real audience," says Tony Wagner, a professor at Harvard University's graduate school of education, and author of *The Global Achievement Gap*, published this year, which argues that America's schools aren't teaching the skills kids need to thrive in the 21st-century economy.

STRAIGHT OUT OF MIT

In Auburn, Ala., Intel ([INTC](#)) has organized "Tech Tuesdays" to bring together faculty, tech employees, and school officials to evaluate the district's technology plans. Students in the school plot data on computerized graphs, and learn letters on electronic whiteboards.

Intel also is connecting faculty members at schools in and around Portland, Ore., with laptop program experts from other states. "There's a sense of hope with the new Administration that there's opportunity for us to reclaim the kind of educational institutions we owe our children," says [Eileen Lento](#), a government and education strategist at Intel. Other progressive schools are using PCs to teach advanced skills like [programming and computer-aided drafting](#).

Intel, IBM, Microsoft ([MSFT](#)), and other tech companies spend hundreds of millions of dollars each year on such programs. Hundreds of school districts have laptops for each student in "one to one" programs, and many more provide access to shared computers. The programs grew out of the work of Seymour Papert at the Massachusetts Institute of Technology in the 1960s and '70s, who advocated active learning over pedagogy. By the '90s, the spread of word processing software made PCs in classrooms more common.

COMPUTERS UNDER FIRE

But many of the programs have fallen short of expectations, say educators. A four-year study of math and reading software in 132 poor, urban schools, released by [Mathematica Policy Research](#) and [SRI International](#) last year, found that test scores weren't significantly higher in classrooms that used the products. A 2003 study by Soloway and another academic found that 65% of teachers said they used computers less than 15 minutes a week in their classes. "In many of these schools, computers are turned off in the back of the classroom," says Harvard's Wagner. At others, "I've been in schools with one-to-one laptop programs where kids are doing the equivalent of worksheets on their laptops," he says. "You don't need computers to do that—it's a big waste of resources."

What's needed, say educators and technology advocates, is a 21st-century curriculum that harnesses PCs and the Internet to equip kids with skills needed in the modern workplace, like critical thinking, analysis, and communications. The task is seen as especially urgent at a time when American schoolkids' math and science mastery has been slipping as the U.S. competes with China and other industrial rivals.

The new approaches also aim to close a lingering "digital divide" between wealthy school districts that load up on computers and poor districts left out in the cold. At the Harvey Milk Academy, for instance, the annual budget for supplies is \$32 per pupil, not counting textbooks, according to Principal Leigh. Motivated students benefit simply from Web access, but most need guidance to get results from classroom computers, says [Stan Litow](#), vice-president of corporate affairs at IBM. "That's why many of the computer labs didn't have a salutary effect on education," he says.

RETHINKING THE CURRICULUM IS A MUST

If the Obama Administration directs more federal money toward school technology programs and softens some of the penalties for schools that don't meet test-score standards, as educators say they hope, it may unleash a burst of new thinking about how best to wire the schoolhouse.

But even proponents of the programs say much of the task falls to schools themselves, which need to rethink their lessons and get serious about training teachers to use the machines. "If you're just sprinkling the technology on top of the curriculum, it's not as compelling," says Intel's Lento. "Then you just have some expensive pencils."

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