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CLASS ACT

As education software moves off the PC, it's opening up a new world for teachers and students



LAST MONTH, WHEN Barbara Allen asked her sixth-grade class at Lemon Grove Middle School to compile a scrapbook on the Sputnik space launch 42 years ago, Ms. Allen was, in a sense, creating her own little bit of history.

Ms. Allen, who directs LemonLINK, the Lemon Grove, Calif., school district's Internet-based computer network, sent out her assignment via e-mail. Her students scoured Web sites for material about Sputnik,

composed their essays on stripped-down computers specially designed to run on Internet-based servers, and submitted them electronically, complete with slides of the Soviet space shot culled off the Net.

Before the LemonLINK system, the school's PCs operated off desktop software. The computers were old and it would have been costly to keep upgrading and maintaining the system. What's more, most of the computers didn't have the power to run new applications like Windows 95 on their hard drives. So the school decided to turn to the Net.

After years of relying on PC-based technology, cash-strapped school districts like Lemon Grove are at last getting their chance to cash in on Internet economics. Instead of spending money on expensive upgrades, schools can use their old PCs or basic computers called thin client devices to run new and fast programs off a Web-based server at an application service provider, or ASP. For some schools, these Web-based systems are dramatically changing the cost of teaching and the way their pupils learn.

"School systems will be one of the biggest beneficiaries of the shift onto the Web," says Edward Iacobucci, founder and chairman of Citrix Systems Inc. The Fort Lauderdale, Fla., company provides technology that allows schools with older PC's or terminals to run Unix, Windows or Java-based software applications over the Internet from an ASP's Web-based server."

"We can replace all the hardware with an appliance that's as easy to run as a telephone," says Mr. Iacobucci. "There's no complexity at the user end. People are just starting to grasp the ramifications of this."

The Lemon Grove school district used Citrix's software to convert its computer system. Before it did, school-district officials faced a dilemma: They had to decide whether to put money into upgrading their district's aging desktop computers or pay for more immediate needs, like repairing school buses. The old PC-based network ate up a lot of money in maintenance costs and upgrades. By using the Internet-based program, they are saving

money that can then be used for pressing needs.

Not Doorstops

"This is a district where 68% of the students get free or reduced-price lunches," says Darryl LaGace, Lemon Grove's director of information services. "We do not have an abundant amount of money, and we wanted to be sure we wouldn't end up with a bunch of computers that were only good as doorstops."

The Problem: The old PCs didn't even have enough power to connect to an ASP's server. That's where Citrix came in. The company's software uses conversion language that allows older PC programs to operate over Web servers, which in the Lemon Grove district's case were **Microsoft** Corp. NT servers. Mr. LaGace cut a deal with **Cox Communications** Inc., an Atlanta-based cable provider, for a model high-speed Internet link. In addition to boosting the old PCs' capability, Mr. LaGace purchased at a reduced rate 300 thin-client terminals from **Wyse Technology** Inc. of San Jose, Calif.

Overall, Mr. LaGace says, the district has invested some \$1.5 million in the system. With a new traditional PC-based system, he says, "we'd pay as much but we'd only be able to access the Internet with a third as many computers. And we'd probably need

more support staff than we have now to maintain them."

"Three years ago," says Ms. Allen, "this technology wasn't available."

In three more years, says Lemon Grove district superintendent Lean King, the district hopes to expand the pilot program so all of its 4,600 pupils and 265 teachers are likely to use Web-based servers, and the district will be linked to city officials, the police and fire departments, libraries and even the city's senior-citizens centers.

"Both students and teachers have reacted positively to the new system," says Ms. Allen, a 20-year veteran teacher and administrator. Students "seem to write more easily on the computer, and with the Internet they can be more creative because they can find art and scan it in."

Eager to Join

Last year, Citrix approached Michael Crovi, technology coordinator for seven Catholic schools in the Charlotte-Mecklenburg, N.C., area and asked whether he was interested in taking part in a pilot program that would put his computers online. Mr. Crovi says he jumped at the chance.

Citrix's Internet system would replace his schools' aging PC-based network of about 500 Dell and IBM clones. The arrangement cost \$20,000 and Citrix also offered to supply the

schools with special academic programs through a partner ASP. Mr. Crovi says he expects to save of \$100,000 in maintenance and upgrades as a result.

He says that the academic programs have had some technological glitches, but adds that the Internet portion of the deal has transformed the way his students use their computers. Teachers and students simply click on a Citrix icon after logging onto the old PCs, and the computers suddenly are running Windows 95 off Citrix's Web servers.

Last January, Charlotte Catholic High School used the system to plug its advanced-placement government and politics class into a course offered over the Internet by **Apex Online Learning** Inc., a distance-learning company based in Bellevue, Wash. Apex has 105 high schools in 26 states using its instructional material over the Net.

An administrator at Charlotte Catholic High School monitored the students' progress. Mr. Crovi says the school is planning to offer the course again in January.

"Our students were interacting through chat rooms with students in Texas and California," says Mr. Crovi. "It takes the grading and content out of our hands. All we have to do is make sure the lesson plans conform to our state standards."

Market Potential

The rave reviews from places like Charlotte Catholic High and Lemon Grove are welcome news to ASPs – the middlemen between software concerns like Citrix and school systems like Lemon Grove. James Kirchner, president of **Learningstation.com**, an Atlanta-based ASP, estimates the market for Internet-based education systems in the U.S. will include some 3.1 million K-12 teachers and 53 million elementary and high school students.

"This is a huge market," says Mr. Kirchner, whose company's revenue jumped to \$3.5 million last year from \$500,000 in 1996. In the future, he says, Internet-based learning programs will be piped into schools and then be available after school at students' homes.

"Right now," Mr. Kirchner says, "you have about 389,000 of those 56.1 million teachers and students online. In five years, we estimate half of them will be online."

Others aren't quite so optimistic. Stephen Rohleder, a senior executive at Andersen Consulting, says his firm concluded a two-year pilot program in August that looked at how well a K-12 school system could shift its PC-based program to an Internet operation. Instead of incurring the large capital expense of upgrading its PCs, the White Lake School, a private school in Fort Worth, Texas, paid Andersen a

monthly fee, like a cable-television subscription, Mr. Rohleder says. Andersen's program linked the White Lake computers to a Web server, bypassing their own desktop operating systems, and helped the schools select a list of Internet-based teaching aids.

In the end, he says, the Internet architecture worked. But Andersen concluded that it would be difficult to standardize the educational portion of its program for the many school systems, each with its own curriculum, in the elementary and high school market.

"This kind of program really challenges the jurisdiction of a school district to control which curriculum they will use," he says. "When someone goes into that market, they're going to need a sales model that is very focused on the mass market."

Andersen says it decided to focus on developing a "virtual university" program because there are far fewer universities than elementary and high schools. The company also thinks much of the college undergraduate curriculum can be standardized.

Needed Connections

Andersen says the market for Internet connections in elementary schools and high schools may have more growth potential. The consulting firm, using 1998 statistics, estimates that about 65% of all U.S. public schools currently have at least one Internet connection. The average public-school district, it says, spends \$125 per student on technology, but has only one computer for every 14 students and one Internet connection per school.

That may change soon. The nation's newest megacharity, the \$17.1 billion Bill and Melinda Gates Foundation,

says it's preparing an "education initiative" that will provide additional Internet connections for poorer school districts.

"What funds many of these schools do have for hardware and software are limited," says Trevor Neilson, the Seattle-based foundation's communications manager. "And the technology becomes outdated very fast, leaving a bunch of old computers sitting in the classroom."

Mr. Neilson says Internet technology such as Web-based computing can help solve some of those problems. "We're taking a long, hard look at these issues, and our education initiative will at least partly address them," he says.

For a start, Mr. Neilson need look no further than the South Carolina adult-education officials to snap up Learningstation.com's offer to set up a Web-based service at the center.

To date, the pilot program is offering Internet access at 15 of the center's 54 adult-education sites around the state. The rest, often located in housing projects and churches, don't have the facilities for Internet access, Ms. Clark says.

Right now, Learningstation.com is allowing the adult-education centers to use its applications at a reduced cost as part of a pilot program. Ms. Clark hopes that she'll be able to winnow the cost of a broader Internet access program down to her center's budget when the pilot program ends next fall.

"We could definitely be missing the boat if we don't participate," she says. "Things are changing too quickly, and our old computers just can't keep up. This is the wave of the future."