Dividing lines
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Dividing Lines

Researchers say certain types of students are not getting the high-tech experiences they need.

At first glance, it's tempting to conclude that the digital divide is closing, declare victory, and move on to other priorities.

Indeed, some policy analysts—such as Adam D. Thierer, an economist at the Heritage Foundation in Washington—are making such overtures. They argue that even social and demographic groups that were clearly on the wrong side of the divide just a few years ago are no longer as digitally disenfranchised as some technology experts say.

For example, schools in high-poverty communities have one computer for every 5.3 students, just slightly higher than the national average of 4.9, according to Market Data Retrieval, a Shelton, Conn., firm that tracks those numbers.

Beneath such figures, though, far different pictures emerge, and they show continuing disparities in access to high-quality technologies and serious inequities in how technology is used for different groups of students.

This year's *Technology Counts* looks beneath the statistics, such as student-to-computer ratios, to shed some light on why specific groups of students are still losing out and what might be done to bridge the gaps. Writers for this report looked specifically at the following groups: students from poor families, minority children, girls, low achievers, students learning to speak English, children with disabilities, and youngsters who live in rural areas.

With poor children, student-to-computer ratios belie huge gaps when it comes to Internet access, according to the U.S. Department of Education. In schools where fewer than 11 percent of students qualify for federally subsidized lunches, for example, 74 percent of classrooms have Internet access. On the other hand, in schools where 71 percent or more students are living in poverty, only 39 percent of classrooms are connected to the Internet.

While a school's poverty rate is a strong predictor of how much Internet access it offers its students, money isn't the only factor that is drawing dividing lines.

According to a study by researchers at Vanderbilt University in Nashville, Tenn., white students—even when income is taken into account—were more than twice as likely to have access to home computers as black students are. Even the white students who didn't have home computers were more likely to log on to the Internet at other locations than their black peers who didn't have access at home.

Who's Losing Out?

Is It Digital Discrimination?

But why are some groups losing out? Is it digital discrimination, personal preference, or a combination of factors that leaves some students on the wrong side of the divide?

Those questions arose time and again when *Technology Counts* examined why so few girls are enrolling in technology-related courses, such as computer networking, that can lead to relatively high-paying jobs straight out of high school. And only 15 percent of the students taking the Advanced Placement exam for computer science last year were girls, according to the New York City-based College Board, which sponsors the AP tests taken by many top college-bound students.

Some gender-equity advocates suggest that subtle forms of discrimination, such as beliefs that girls are not well-suited for technology jobs, are discouraging them from even taking technology courses. Others say it's likely the small number of girls in technology-related classes has more to do with different prefer-

ences than anything else, and it would be a mistake to pressure girls to enter technical fields when their interests lie elsewhere.

This year's *Technology Counts* also found that, inside classrooms, teachers are making decisions that could be contributing unintentionally to the digital divide.

A growing body of research shows, for example, that teachers tend to infuse technology into lessons much less with low-achieving students than with high achievers.

Many teachers say they would like to integrate more technology into classes for lower achievers, but the realities of teaching make it difficult. With tight time constraints, such as 45-minute periods in many high schools, some teachers feel they have to forgo technology use to make sure they cover the prescribed curriculum—a more time-consuming task with students who have weaker skills or less motivation.

Similar difficulties often lead teachers of bilingual students to limit the use of technology in their classes, too, according to advocates for students who are still learning English.

"What we found is there was very little use by [those] students of computer labs, either because the teacher didn't take them or their schedule was full, or there wasn't a bilingual person to assist students in the lab," says Jane E. Lopez, a lawyer for Multicultural Education, Training, and Advocacy Inc., a Boston nonprofit organization that monitors services for students with limited English skills. "When schools put money into these labs and say, 'All kids benefit,' that's not necessarily the case."

Legal Battles

Advocates for students with special needs say schools must be aware of technological inequities and take steps to fill the gaps. And if schools ignore the problem, parents might turn to the courts for help.

In Oregon, for example, a group of parents filed a lawsuit in 1999 against the state, arguing that their children with learning disabilities were not permitted to use technology tools when they took standardized state tests. As part of a settlement reached this year, Oregon students with such disabilities are now allowed on a case-by-case basis to use spell-checking software, dictation machines, and other technology tools to help them when taking state exams.

For some students, though, it's not a question of academic motivation, how well they speak English, or whether they have a disability. Rather, they're finding themselves on the wrong side of the digital divide simply because they live in remote rural areas. Their schools are struggling with what technology experts call the "last mile" problem.

Simply put, it's too costly for telecommunications companies to lay the fiber-optic cable necessary to run high-speed Internet lines into those communities, because there are just not enough customers. As a result, in some rural communities, slow Internet lines mean it takes up to half an hour to download a few e-mail messages.

Still, many school districts—in rural as well as urban areas—are building the infrastructure necessary to infuse more technology into their classrooms, says Steven A. Sanchez, the director of curriculum, instruction, and learning technologies for the New Mexico education department.

At the same time, he says, a "learning divide" is evolving—one in which concerns about differences in access to current communications technologies are being replaced by worries that some educators are using technology wisely and efficiently while others are not.

The problem, Sanchez says, goes "way beyond a lack of machines."

—THE EDITORS