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Computers at Home: Educational Hope vs. Teenage Reality

By RANDALL STROSS

MIDDLE SCHOOL students are champion time-wasters. And the personal computer may be the ultimate time-wasting appliance. Put the two together at home, without hovering supervision, and logic suggests that you won't witness a miraculous educational transformation.

Still, wherever there is a low-income household unboxing the family's very first personal computer, there is an automatic inclination to think of the machine in its most idealized form, as the Great Equalizer. In developing countries, computers are outfitted with grand educational hopes, like those that animate the One Laptop Per Child initiative, which was examined in this space in April. The same is true of computers that go to poor households in the United States.

Economists are trying to measure a home computer's educational impact on schoolchildren in low-income households. Taking widely varying routes, they are arriving at similar conclusions: little or no educational benefit is found. Worse, computers seem to have further separated children in low-income households, whose test scores often decline after the machine arrives, from their more privileged counterparts.

Ofer Malamud, an assistant professor of economics at the University of Chicago, is the co-author of a study that investigated educational outcomes after low-income families received vouchers to help them buy computers.

"We found a negative effect on academic achievement," he said. "I was surprised, but as we presented our findings at various seminars, people in the audience said they weren't surprised, given their own experiences with their school-age children."

Professor Malamud and his collaborator, Cristian Pop-Eleches, an assistant professor of economics at Columbia University, did their field work in Romania in 2009, where the

government invited low-income families to apply for vouchers worth 200 euros (then about $300) that could be used for buying a home computer.

The program provided a control group: the families who applied but did not receive a voucher. They showed the same desire to own a machine, and their income was often only slightly above the cut-off point for the government program.

In a draft of an article that the Quarterly Journal of Economics will publish early next year, the professors report finding "strong evidence that children in households who won a voucher received significantly lower school grades in math, English and Romanian." The principal positive effect on the students was improved computer skills.

At that time, most Romanian households were not yet connected to the Internet. But few children whose families obtained computers said they used the machines for homework. What they were used for — daily — was playing games.

In the United States, Jacob L. Vigdor and Helen F. Ladd, professors of public policy at Duke University, reported similar findings. Their National Bureau of Economic Research working paper, "Scaling the Digital Divide," published last month, looks at the arrival of broadband service in North Carolina between 2000 and 2005 and its effect on middle school test scores during that period. Students posted significantly lower math test scores after the first broadband service provider showed up in their neighborhood, and significantly lower reading scores as well when the number of broadband providers passed four.

The Duke paper reports that the negative effect on test scores was not universal, but was largely confined to lower-income households, in which, the authors hypothesized, parental supervision might be spottier, giving students greater opportunity to use the computer for entertainment unrelated to homework and reducing the amount of time spent studying.

The North Carolina study suggests the disconcerting possibility that home computers and Internet access have such a negative effect only on some groups and end up widening achievement gaps between socioeconomic groups. The expansion of broadband service was associated with a pronounced drop in test scores for black students in both reading and math, but no effect on the math scores and little on the reading scores of other students. In the report, the authors do not speculate about what caused the disparities. Neither author responded to a request for an interview.

The state of Texas recently completed a four-year experiment in "technology immersion." The project spent $20 million in federal money on laptops distributed to 21 middle schools

whose students were permitted to take the machines home. Another 21 schools that did not receive funds for laptops were designated as control schools.

At the conclusion, a report prepared by the Texas Center for Educational Research tried to make the case that test scores in some academic subjects improved slightly at participating schools over those of the control schools. But the differences were mixed and included lower scores for writing among the students at schools "immersed" in technology.

THE one area where the students from lower-income families in the immersion program closed the gap with higher-income students was the same one identified in the Romanian study: computer skills.

Catherine Maloney, director of the Texas center, said the schools did their best to mandate that the computers would be used strictly for educational purposes. Most schools configured the machines to block e-mail, chat, games and Web sites reached by searching on objectionable key words. The key-word blocks worked fine for English-language sites but not for Spanish ones. "Kids were adept at getting around the blocks," she said.

How disappointing to read in the Texas study that "there was no evidence linking technology immersion with student self-directed learning or their general satisfaction with schoolwork."

When devising ways to beat school policing software, students showed an exemplary capacity for self-directed learning. Too bad that capacity didn't expand in academic directions, too.

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