COVID-19, Education and Robust Broadband

The pandemic sheds light on the gaps in online education today – and opportunities for improving it now and in the future.

By Rollie Cole / *Sagamore Institute for Policy Research*

When the coronavirus pandemic reached the United States in early 2020, the educational system was transformed almost overnight.

According to Aura Vision, between mid-March 2020 and early April 2020, 39 of the 50 states issued some form of lockdown order. Many cities, counties, K–12 school districts, and institutions of higher education locked down even earlier. All locked-down educational institutions then scrambled to continue some form of instruction (and in some cases other activities) online.

Educators had support in the form of free online content for students (some of it made available specifically for the pandemic) and many guides to best practices for teaching online. Still, many school districts and colleges struggled to connect with students and to make online education engaging and effective.

As I tracked news reports about school districts' experiences and spoke with an ISP and a vendor trying to help teachers move from classroom to online instruction, I realized there were lessons to be learned about both the demand side of online education – how end users and intermediaries use broadband (or clamor for broadband to use) – and the supply side.

SUPPLY SIDE LESSONS

1. **Broadband to the residential unit (or near to it) is now much more important than before.**

West Carolina Tel, a telephone cooperative in South Carolina, told me that a significant percentage of its end users had never used broadband to work or study from home before the pandemic. Those who already had broadband filled in the "valley" of use that occurred during the day, but surprisingly added little to the "peak" that occurred in the early evening. That stayed about the same, and additional use spread throughout the day.

2. **Upload is now much more important than before.**

Gamers always cared about upload, latency and reliability in a way those watching highly buffered or downloaded videos did not. Now, with the need to engage in real-time video conferencing and upload work documents, reliability, latency and upload all matter to a much broader swath of people. Students are no exception. For example, the College Board tweeted on May 11 that of the 50,000 people taking the AP Physics C: Mechanics exam, about 2 percent encountered issues attempting to submit their responses. These students had to retake their exams.

3. **Reaching the unserved at or near residential units requires new forms of cooperation.**

West Carolina Tel wanted to install Wi-Fi hot spots in unserved neighborhoods. To do so required finding property owners with parking spaces and lights and cutting deals with local police forces to keep such areas

safe for kids and other people there to use the Wi-Fi. The ISP had not worked with lighting or police protection before. Another ISP, East Carolina Broadband, had a similar experience working with a church, a flea market, a town, a school media center and a county courthouse.

DEMAND SIDE LESSONS

1. It's important to translate lessons in an online environment.

Many teachers, educational institutions and parents experienced firsthand what those most heavily involved in online education had been saying for at least several years – reading on a screen differs from reading on paper, and hearing and seeing a live lecture differs from watching a video. Just as a filmed play is not a movie, materials and practices that work reasonably well in classroom and laboratory settings need to be "translated" before they work anywhere near as well online. Even attendance is more difficult when school moves online – one Israeli mother's YouTube rant about how much more difficult it is to keep children in front of a screen paying attention than to send them off to school went viral.

The country will be left with many examples of what works and what does not. Teachers at many levels have been innovative in teaching subjects that ordinarily require labs or workshops (for instance, in science and in various arts). The Harvard Gazette reports that in one Harvard science course, a classroom assignment asked students to collect biological samples from their environments, extract the DNA and analyze the resulting data. When learning moved online, the professor instead collected samples from household items and recorded a teaching fellow modeling the DNA extraction process, then sent the resulting data to students for analysis. The professor told the Gazette, "even though [students] miss the part of doing the field biology, they still get to do part of the scientific process, which is very fun, because the answer is unknown and they'll get to discover that themselves."

Professors at the Harvard Graduate School of Design also are experimenting with new techniques. Usually design work relies on three-dimensional models and prototypes. Now, however, professors and students are creating virtual pin-up boards, which allows them to review work on one screen and conduct Zoom conversations or critiques on another.

Harvard faculty even have reported some remarkable *benefits* of online learning. At the Harvard Graduate School of Education, for instance, faculty have been experimenting with providing interactive and social time at the beginning and end of classes, creating intimate experiences for

students. "With no 'front row/back row,' dynamic in Zoom learning, faculty say that class participation has been rich, and students are creating their own collaborations," the article says. Students also appeared more comfortable participating and presenting at Harvard Law School and Harvard Business School during online classes.

It is encouraging that many educators have adapted so rapidly to the demands of online teaching, but as schools remain online at least for the near future, educators at all levels should make special efforts to adapt lessons to an online environment. According to an article in EdSurge, an education news organization, successful online education requires specially designing elements of lessons for a virtual space so students don't simply scroll through a presentation numbly. Making lessons interactive (to avoid students' feeling isolated) and fun is equally important. Online learning also demands that educators not take a one-size-fits-all approach, and adapt lessons for different learning styles.

2. **The hurdle of the digital divide persists.**
The need for most of us to study from home (or work from home) did move a "robust broadband connection" from a luxury to a necessity. The line by former President George W. Bush likening the digital divide to the "Mercedes divide" was long gone. Most of us need to stay home to protect everyone else, and broadband is essential

to working, studying and socializing while doing that, not simply a luxurious way to do what could be done otherwise. Education at the K–12 level is required by law usually, and education beyond that (higher education and adult education) is seen as a good thing for students and the rest of the population. If broadband is "needed" to provide that education, then it is needed by everybody.

Many ISPs of various sizes agreed with this conclusion and stepped forward in various ways to help meet the need for broadband, many in ways, such as the multi-agency cooperation listed above, that had not been tried before. Two other examples are Wi-Fi broadband and "MacGyver boxes" (kits for setting up Wi-Fi access points). For instance, South Dakota's Golden West Telecommunications made MacGyver boxes available in its central offices. In some cases, equipment was installed on the side of a house if a customer had a drop there. In other cases, Wi-Fi was beamed into a house from outside and a box of materials was left on the front step.

Other ISPs and tech companies stepped up, offering price reductions, cash payments and end-user equipment, such as Chromebooks. Many educational technology vendors stepped forward to help as well, with free software and other resources. For instance, McGraw-Hill offers

remote learning support for K–12 and college students, and the College Board offers AP online classes and review sessions led by teachers. Students can attend live classes or view them on demand at the College Board's YouTube page.

In an important related note outside BROADBAND COMMUNITIES' scope, the free and discounted meal programs at pre-K and K–12 institutions provided significant percentages of the daily calories for their recipients before school closures. School districts and other organizations scrambled to meet that need, with various levels of success, after the buildings where the meals had been served were closed. Just as broadband at school helped close the digital divide, meals at school helped close the food divide.

3. The unbundling of educational services will become more prevalent.
The pandemic has increased awareness of the "bundle" of services and activities educational institutions deliver at all levels (perhaps except for most adult education). These include day care, feeding, physical activities, social activities, health care, career guidance, sometimes housing and so on. Closing campuses requires making choices about which services to continue and how to do so safely.

For instance, multiple layers of solo recordings allow forms of group musical activity to take place online, but I cannot imagine the equivalent for most group sports if social distancing guidelines remain in place. Various organizations are contemplating removing social distancing protocols for athletes (all of whom are under careful scrutiny regarding their physical condition), but keeping the spectators remote. Opening up sports in this way will probably demand the same "translation" required for successful online instruction.

Rethinking of bundling is apt to have significant long-term consequences, even if the risk of contagious disease is minimal thanks to testing, treatment and vaccines. The bundles offered by elite institutions, which have survived technological and social change for centuries, likely will remain attractive. But institutions that offer slimmer bundles (primarily limited to classroom-based instruction, with no cutting-edge research, a very limited selection of extracurricular activities and little or no on-campus housing) may disappear or move 100 percent online. Elite institutions may continue to expand their markets by offering subsets of their bundles

to a wider market. They already have outside sponsors for research and summer and short programs for instructional services and were starting online instructional offerings even before the pandemic. Even if deemed "inferior" to the on-campus equivalent, they may be deemed "good enough" for many, especially because they may cost much less (in dollars and time) than on-campus offerings.

4. Robust broadband should be a public utility.
I hope that the role broadband plays in economic activity, in educational activity, in health activity, and in many other ways during the pandemic will finally end the debate over whether broadband should be deemed a public utility, equivalent to electricity and potable water. Technology has progressed to the point where even fiber to the home (the "gold standard" for robustness) is cheaper to deliver than water or electricity – yet building codes still will not allow a building to open without water or electricity but *will* allow it to open with no foreseeable access to broadband. I'm hopeful the pandemic will allow the United States to make significant progress in giving equal weight to broadband. ❖

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