Closing the K–12 Digital Divide in The Age of Distance Learning

Because of COVID-19 facility closures, 50 million K–12 public school students have had to learn remotely from home.

By Sumit Chandra, Amy Chang, Lauren Day, Jack Liu, Lane McBride and Thisal Mudalige / *BCG*
and Danny Weiss and Amina Fazlullah / *Common Sense*

This article is adapted from a report developed by the Boston Consulting Group in partnership with Common Sense, a nonprofit organization dedicated to improving the lives of all kids and families. Read the full report here: https://tinyurl.com/yxmbvt9z. A subsequent report (https://tinyurl.com/y5lq5gsj) offers guidance for how states and school districts can assess needs, procure solutions and access funds to close the digital divide.

Across the United States, even before the onset of the coronavirus pandemic, there was a significant digital divide between K–12 students with and those without access to high-speed internet and computing devices at home, known as the "homework gap." A new analysis by Common Sense and the Boston Consulting Group (BCG) finds that the nature of the homework gap has changed in this period of distance learning caused by the pandemic and that the gap is larger than previously understood.

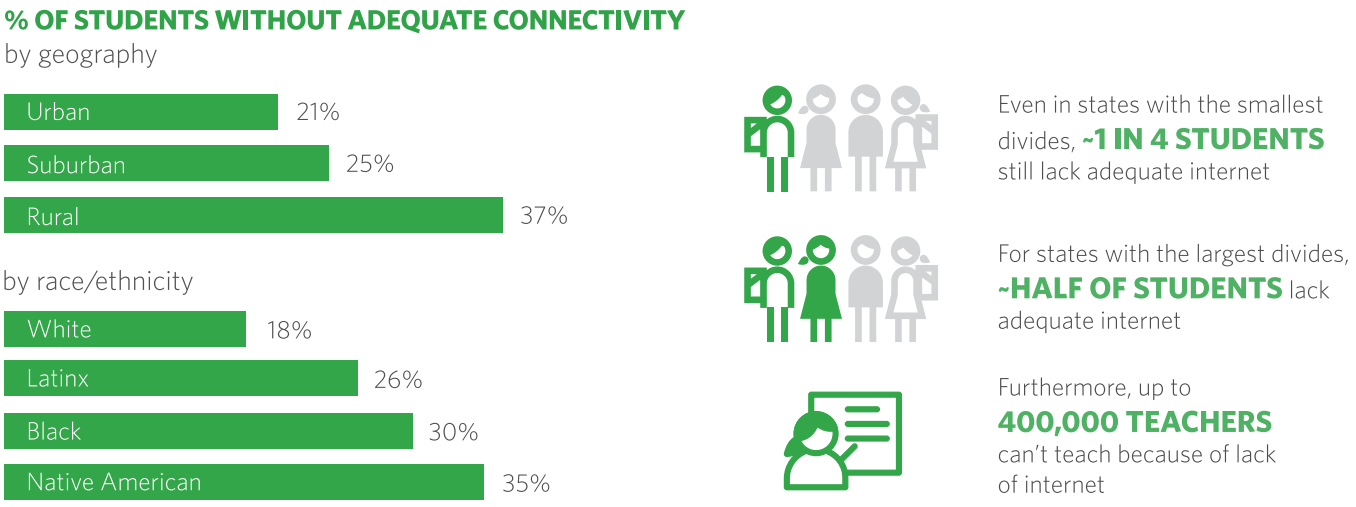
The analysis puts a first-year price tag on closing the gap and for the first time estimates the digital divide for public school teachers. It provides a detailed assessment of the digital divide's interrelated components of internet connection and devices and the respective technical requirements needed to ensure adequate distance learning for today's students and teachers.

Combining the most recent 2018 data from the U.S. Census Bureau and the National Center for Education Statistics, this report shows that before the pandemic, an estimated 15 million to 16 million K–12 public school students lived in households without an internet connection or a device adequate for distance learning, representing 30 percent of all public K–12 students. Of these students, approximately 9 million live in households that have neither an adequate connection nor an adequate device for distance learning.

The COVID-19 pandemic exacerbates this problem, causing an unprecedented disruption in the U.S. educational system. Nearly all U.S. public schools closed early this year, driving more than 50 million students to transition to full-time distance learning from home. Nationwide, 99 percent of public schools have high-speed broadband access, but distance learning from home presents many challenges, with the potential for significant inequities given internet and device gaps. Digital platforms are often the only option for educators to stay safely and deeply connected to their students' development at this time.

The homework gap is no longer just about homework; it's about access to education. In this new environment, with the prospect of distance learning extending into the future, lack of technology access will significantly impact students' ability to learn and engage, accelerating learning loss for students cut off

The digital divide is a major problem across all 50 states



With most U.S. students learning remotely, the digital divide prevents many students from accessing the education they deserve.

from teachers and peer resources. One study projected that by the start of this school year, students, on average, may have lost up to a third of their expected progress from the prior year in reading and half of their expected progress in math because of school closures caused by COVID-19.

A NATIONWIDE PROBLEM

The interactive map at www.commonsensemedia.org/digital-divide-stories#/state shows that the student digital divide is a major problem across all 50 states. The digital divide affects every type of community, but it is more pronounced in rural communities and for Black, Latinx, and Native American households; 18 percent of white households lack broadband, but 26 percent of Latinx, 30 percent of Black and 35 percent of Native American student households lack adequate home internet access.

In rural communities, 37 percent of students are without a home broadband connection compared with 25 percent in suburban households and 21 percent in urban areas.

The top 10 states with the largest absolute number of disconnected students comprise approximately 50 percent of the overall need, with Texas, California and Florida having the largest populations of students without internet connectivity.

TECHNOLOGY REQUIREMENTS FOR DISTANCE LEARNING

Our analysis finds that for a robust distance-learning experience, students and teachers need four things: high-speed internet service, internet-enabled devices that support assignment completion (excluding cell phones), distance learning instructional content, and support, including digital literacy, teacher readiness and technical support.

Though the majority of Americans have access to some form of internet service, not all services are robust enough to support distance learning. Internet service must meet certain download and upload speeds to be effective in a distance learning environment. With videoconferencing increasingly used for distance learning, coupled with other household video needs, such as working from home and telemedicine, household download and upload speed requirements are increasing. For a household with a single user, broadband speeds of at least 25 Mbps/3 Mbps are needed to be able to participate in distance learning.

To apply internet access to distance learning, students also need suitable devices, including laptops and tablets. Mobile phones, though helpful learning supplements, are not appropriate for completing and submitting assignments because many education platforms are not optimized for mobile.

By population: 10 states with the largest population of K-12 students without adequate internet connection

State	Without adequate connection	% Without adequate connection	Without adequate device	% Without adequate device
Texas	1,829,000	34%	1,339,000	25%
California	1,529,000	25%	1,063,000	17%
Florida	801,000	28%	549,000	19%
New York	726,000	27%	567,000	21%
Illinois	589,000	30%	430,000	22%
Georgia	560,000	32%	401,000	23%
Ohio	500,000	29%	402,000	24%
Michigan	488,000	32%	350,000	23%
Pennsylvania	484,000	28%	390,000	23%
N. Carolina	469,000	30%	355,000	23%

Top 10 states represent ~53% of total students without adequate connection

Source: American Community Survey compiled at household level – 1 year aggregation, NCES, BCG analysis

Teachers also are affected by lack of home internet and devices; our analysis reveals that approximately 300,000 to 400,000 public school teachers (8 percent) lack access to adequate connectivity, and 100,000 (3 percent) lack devices, limiting the distance learning potential for entire classrooms of students.

Another technology requirement – instructional content – must be tailored to students' unique needs, including age-specific developmental requirements and students' home learning environments. Depending on internet connectivity speeds, teachers must consider alternative instructional content and tools with lower internet speed requirements. Real-time engagement is an important tool that allows teachers to facilitate engagement with classmates and offer one-on-one attention and support.

Finally, quality technical support is required as users activate, build a knowledge base for, and troubleshoot issues with their connectivity, devices and tools. As schools make decisions on required technology for devices and connectivity, product availability may constrain their choices. For example, many schools prioritized procurement of Chromebooks because of simplicity, cost effectiveness and compatibility with Google Classroom and Google Docs. However, the supply of Chromebooks and low-end Windows PCs has quickly become constrained during the pandemic. This is likely to continue.

COST OF CLOSING THE DIGITAL DIVIDE

In addition to revealing a new and larger estimate of the size of the student digital divide and an assessment of the digital divide for teachers, we estimate that the cost of closing the digital divide for K–12 public school students ranges from $6 billion to $11 billion in the first year and up to an additional $1 billion for teachers. This estimate covers the costs of an adequate internet plan, related connectivity expenses and computers, laptops or tablets for all students and teachers who are "digitally divided."

As stakeholders decide how to meet student and teacher requirements and what it will take, it will be important to understand local student and teacher needs alongside school district priorities. Students and teachers urgently need support for distance learning, and the financial and technological sustainability of the solutions will be critical to reducing long-term costs. In particular, stakeholders must consider how they will support the recurring costs of home connectivity as well as device replacement and upgrade costs that occur several years after initial purchase.

TRENDS IMPACTING THE DIGITAL DIVIDE IN 2020

The figures used in this report to characterize the distance learning digital divide draw from data captured prior to the COVID-19 pandemic. It is necessary to acknowledge the underlying trends and shifts across U.S. households since March 2020, for which there is limited comprehensive data. Based on qualitative interviews of network providers, school districts and others, as well as literature reviews, we find that three key trends impacted these size estimates at the beginning of the 2020–2021 school year.

First, school districts, governments, the private sector and philanthropists across the United States have made significant, swift efforts to provide devices and connectivity to students since March 2020. Yet, the data on these efforts is intermittent and inconsistently measured (though several organizations are working to track this data across the country). These efforts certainly have reduced the existing gaps in pockets, particularly for large urban districts. Smaller school districts face more hurdles to access technology, with smaller scale and smaller budgets, while competing for supply with other large and small districts. In addition, Congress included distance learning as an allowable expense for K–12 schools in its March stimulus bill.

Some school districts will use funds for this purpose, but the limited appropriations for public schools must compete among multiple priorities at a time of reduced budgets and have only recently reached states for distribution.

Second, unprecedented unemployment rates are forcing many formerly middle-class families to seek services and support to meet basic needs, including food security. Because the Keep Americans Connected Pledge expired on June 30, many families may need to make difficult financial trade-offs, including becoming delinquent on or opting out of household internet service as a result of these economic challenges.

Third, social distancing measures under COVID-19 make internet connectivity an essential to safely stay in touch with friends and family, work from home, apply for jobs, and keep up with critical developments. Families that previously relied on public libraries and public Wi-Fi in cafés and restaurants that are now closed or limiting patrons are finding that having access to the internet at home has become increasingly critical.

These supply and demand trends will undoubtedly have different and opposing impacts on the size of the K–12 digital divide in 2020, and it is too early to understand how they will change the size and nature of the divide. Moving forward, observing and analyzing these trends will be critical to gaining a deeper understanding of the drivers and size of this gap for this school year.

MOVING TO CLOSE THE DIGITAL DIVIDE

Because of the COVID-19 crisis, the distance learning digital divide is no longer a matter of a homework gap but of whether or not a child can access education. Addressing this challenge will require a deep understanding of local circumstances and needs, significant financial investment, and the ability for districts to decide what is best for their community and educational aspirations.

We see a significant opportunity to use this difficult moment in history to reshape the future of learning through digital education. Various stakeholders can play important roles to help catalyze long-term change while closing the digital divide in the short term.

Policymakers: Take swift policy action in the short term, and invest for the long term. Closing the K–12 digital divide requires action by Congress on a short-term basis in the next COVID-19 federal stimulus bill by providing direct funding to ensure internet service and devices at home for students who lack them today. Congress must also take long-term action and invest funding to upgrade and close gaps in U.S. broadband infrastructure. These actions will ensure robust universal broadband access for all students and families.

Districts: Define digital education long-term aspirations and objectives and identify the necessary technology, infrastructure and capabilities to enable that vision. This is a critical time for districts to build out, evaluate and scale existing plans, while also assessing how they may need to shift in the current context, and look beyond short-term crisis response. Decisions should be made with a three- to five-year view so districts can acquire technology that can be sustained over time.

Private sector: Help deliver, prioritize and support education technology needs. Network providers and device manufacturers must provide transparent, discounted and consistent prices across all districts: Many districts are navigating significant differences in price, and smaller districts lacking purchasing power face higher prices.

Education organizations/ nonprofits: Build data, coordination and support to systematically address gaps. With so many districts facing a similar issue, it is important to apply a collaborative rather than a competitive mindset. For example, states such as Texas, California and Connecticut are developing models for cross-district collaboration to ensure all districts get what they need and with greater leverage and scale for negotiation.

High-speed internet connection at home is not a luxury. It is as essential as electricity and running water to be fully engaged in U.S. society and to ensure equal opportunity at desired educational, economic, health, public safety and social outcomes. Closing the digital divide will require public and private sectors to come together with a sense of urgency for immediate action to ensure equitable learning opportunities during the pandemic and a sustained commitment to secure the nation's educational future by ensuring that digital technology will benefit all students and their families. ❖

Sumit Chandra, Amy Chang, Lauren Day, Jack Liu, Lane McBride and Thisal Mudalige are consultants at BCG. Amina Fazlullah is the digital equity policy counsel and Danny Weiss is senior policy advsisor at Common Sense.