Institute for Youth in Policy

5214F Diamond Heights Blvd #3055
San Francisco, CA 94109
+1 (715) 469-6884
fellowship@yipinstitute.org
www.yipinstitute.org/fellowship/

Fellowship Capstone | Policy Brief

The Digital Divide in Education

Chris Qian

I. Executive summary

As the global economy becomes increasingly dependent on digital technologies, a fault line has formed between those with digital access and those without, a phenomenon commonly referred to as "the digital divide." Bridging the divide requires us to dig into the root of the problem: education. This brief explores how the digital divide in education exacerbates preexisting societal disparities and presents specific policy solutions to bridge the divide.

II. Overview

First, it's critical to recognize that the digital divide is not caused by a sheer lack of hardware; in 2022 alone, 62 million tons of electronic waste piled up in landfills, and electronic waste is the fastest growing solid waste stream (1). Rather, the issue stems from the lack of effective ways to properly distribute technology to communities and even individuals who lack it. For students, lack of information and communication technologies (ICTs) poses a serious barrier as it prevents them from developing critical technical skills that are essential for numerous jobs in the 21st century. Thus, this paper examines the precise implications of the digital divide, its roots, and potential policy solutions.

A. Relevance

In the digital age, 47% percent of jobs "definitely require digital skills," according to the Federal Reserve of Atlanta (2). Moreover, most of the jobs that require digital skills are the highest paying and most stable jobs (3). Logically, people without digital skills fare significantly worse in the job market compared to those who do. Students who lack access to ICTs from a young age, therefore, are less likely to have a successful career because they have less opportunities to develop their technical skills.

Beyond technical skills, much of our education simply relies on technology. The COVID-19 pandemic demonstrated this very clearly; while virtually all socioeconomic levels of education, rich or poor, were negatively affected, students in poorer, more rural communities most frequently lacked the resources to provide their children adequate technology to sustain learning through the pandemic. (4)

III. History

A. Current Stances

The term "digital divide" was coined in 1994, right at the dawn of the computer age when many middle-class American families and most corporate offices had computers.

During the Reagan administration, the American economy switched from a manufacturing-based

economy to a service-based economy. By the 2000s, most of these service based jobs required a baseline proficiency in digital literacy. For instance, administrative assistants, customer service representatives, and retail managers were increasingly expected to use computers for tasks like word processing, spreadsheets, email communication, and database management. Even jobs in traditionally "non-technical" fields began requiring basic software skills, internet research capabilities, and familiarity with emerging digital tools. This shift meant that students without early access to computers and the internet were at a growing disadvantage, as they lacked both exposure and practice with the technologies that would be essential in the workforce (5).

According to 1998 Census data, while most Americans had access to telephones, computers, and the Internet, inequalities in home Internet access were actually widening. Households earning $75,000 or more were five times more likely to own a home computer than those with the lowest incomes—a disparity that grew by nearly 30% between 1997 and 1998. Similarly, white households were about two and a half times more likely to have home Internet access than African-American and Hispanic households, with this racial gap expanding by 38% in just one year. During the same period, the difference in home Internet access between individuals with the highest and lowest levels of education increased by 25% (6).

IV. Policy Problem

A. Stakeholders

The primary stakeholders of the digital divide in education are, most obviously, students and their parents living in poorly-funded areas. Lack of access to technology prevents them from developing critical technical skills, accessing learning materials to advance their education, and communicating easily with others. Consequently, these students are significantly less likely to attend college, advance into high paying careers, or build fruitful networks. Logically, parents of these children, by extension, have a stake in this issue, as they are likely unable to afford critical technology for their children and thus, require alternate means of providing technology for their children.

Teachers, school leaders, and other educators all benefit from closing the digital divide. Teachers benefit by having a streamlined way to communicate with students and assign work; school board members benefit as increased academic performance increases the funding for their schools and attracts more families. Moreover, technology companies who provide the infrastructure and hardware to bridge the digital divide stand to gain substantially, not only in profit but in philanthropic recognition.

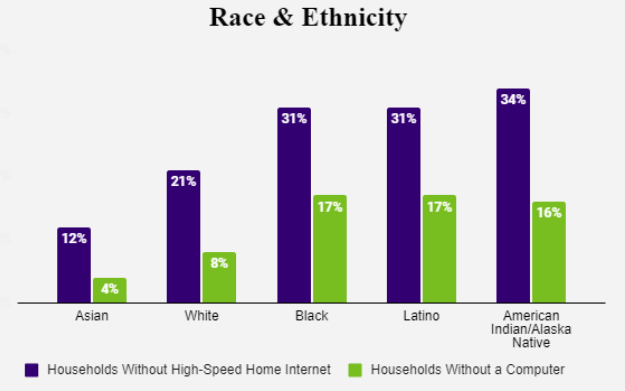
B. Risks of Indifference

As mentioned earlier, the digital divide in education is most visible along preexisting societal fault lines, including but not limited to racial, geopolitical, and socioeconomic disparities. If left unchecked, the digital divide will only widen as emerging technologies rapidly take over the modern economy, leaving the marginalized behind. Additionally, studies show that education (or a lack of education) has an extremely powerful compounding effect; if someone receives minimal education, they're likely to have parents with similar educational disadvantages, and their children are, in turn, more likely to experience the same challenges (7). Thus, ignoring the digital divide not only affects the current generation of students, but also all forthcoming generations.

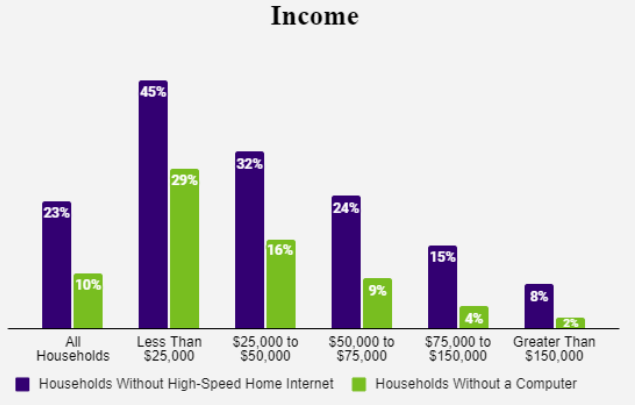
C. Nonpartisan Reasoning

As we'll explore in the tried policies section of this brief, the digital divide in education is a bipartisan issue that both sides of the aisle have tried addressing. Ensuring equitable access to technology in schools provides widespread benefits for the society as a whole, including the following:

1. Economic Growth: UNESCO's data set revealed that every dollar invested into a country's education yielded a net $10-15 in overall economic growth, a staggering return on investment (8). Moreover, the U.S. Bureau of Labor Statistics predicted the fastest growing industry from 2023-2033 to be "computer systems and design related services," as it alone is projected to grow by nearly 20% in the decade (9). Therefore, it is logical to conclude that government investments into bridging the digital divide will yield significant net returns, particularly in the next few decades as technology proliferates the modern U.S. economy. Historical data from National Center for Education Statistics corroborates this claim: "Increases in educational attainment were responsible for an estimated 11 to 20 percent of growth in worker productivity in the United States in recent decades" (10). Regardless of political ideology, the statistics indicate a clearly substantial return on investment for investments into education, particularly digital education.
2. Social inclusivity and equity: Racially, 1 in 3 Black, Latino, and American Indian/Alaska Native students do not have computer access and are more likely than their White peers to be disconnected from online learning.



Moreover, globally, 58% of school-age children in the richest households have internet access, compared to just 16% of the poorest households (11).



This is concerning. While the digital divide is a fundamentally economic and technical problem, it has numerous social consequences, and if left unchecked, it will continue to drive the racial and socioeconomic wedges.

3. Educational equity: When COVID-19 forced 55 million students to transition to online school, an astonishing 16.9 million children remained logged out from instruction and could not learn because their families lacked sufficient technology (11). While the pandemic has largely receded, a 2023 report found that 89% of K-12 instructors use educational technology in their classrooms, dubbing them "essential technologies" (12). Logically, students without personal

devices or access to the internet at home are at a major disadvantage compared to their connected peers.

V. Tried Policy

Early on, the U.S. government recognized that the digital divide was going to be an issue, so the Federal Communications Commission (FCC) started the E-Rate program in 1996, which subsidized internet access in schools and libraries. Most digital divide analysts classify this program as a success; according to the FCC, by 2005, 94% of schools had internet access, and by 2006, 98% of all public libraries in the U.S. had internet access (13). Building off the E-Rate program, in 2002, President George W. Bush signed the No Child Left Behind Act, which included the Enhancing Education Through Technology (EETT). The EETT played a major role in providing grants to states to help integrate technology and the internet into the classrooms. Thus, while internet and technology is readily available in schools and libraries, the final frontier of the digital divide in education that needs to be addressed is securing internet connectivity and technology access in households.

The COVID-19 pandemic in 2020 served as a catalyst for a renewed focus on the digital divide. Critically, in 2021, President Biden signed into law the Infrastructure Investment and Jobs Act, which included the Affordable Connectivity Program (ACP). The ACP aimed to combat the digital divide in low-income households by offering $30 per month bandwidth services to qualifying individuals and $75 per month services to qualifying families. Additionally, it gave a $100 first-time discount for any purchased laptop, desktop, or tablet. The program helped more than 23 million households, including 330,000 tribal households. Nearly 70% of respondents to the ACP survey indicated that before receiving program benefits, they had either unreliable internet service or none at all, with most attributing this lack of access to high costs. Around 80% stated they would likely downgrade or cancel their internet plans if ACP benefits were discontinued. Additionally, many families noted they would have to reduce spending on other essential needs to afford rising internet costs once the program ends (14). Therefore, when the program ran out of funding in May 2024, it was a huge setback that left approximately 5 million low-income individuals without bandwidth. In addition to benefits in healthcare and labor market participation, the benefits the ACP had on education were truly impactful: Research concluded that having internet access at home increased a student's GPA by 0.4 to 0.7 points, particularly in English and Social Studies. Moreover, a standard deviation improvement in 8th grade math test scores resulted in an 8% increase in income (15).

VI. Policy Options

The following policy options work specifically to bridge the final frontier of the digital divide – providing internet and computer hardware to every student's household:

Renewing and reforming the ACP

A major critique of the ACP was its long and convoluted registration process. Therefore, reducing the registration paperwork and making it streamlined with students enrolled in other social programs (like free lunch) would help increase the efficacy of ACP. Moreover,

recategorizing the ACP as a permanent entitlement program would ensure its long-term efficacy, as it wouldn't be contingent upon appropriation battles in Congress.

Additionally, because the ACP was an optional program, the scope of its impact was limited. However, implementing state or federal laws mandating home internet and devices for all students would guarantee a connected learning environment for all students. By treating home internet and devices as essentials – just as school transportation and textbooks are – we can eliminate the last vestiges of the digital divide.

Public-private partnerships

Historically, public-private partnerships have proved effective at bridging the digital divide. For instance, the ConnectHomeUSA program – launched by the U.S. Department of Housing and Urban Development – partnered with major companies like Cox, Google Fiber, and AT&T to provide bandwidth to over 100,000 Americans. Building off the existing infrastructure networks and technologies developed by private companies would be an effective way to reduce costs. For instance, Starlink — an inexpensive satellite dish that connects rural areas to the internet — has been quite effective in bridging the digital divide: it has over 6 million global users currently, and CNET described it as "a godsend for people in rural areas" (16). If supported with federal subsidies to reduce the cost barrier for low-income families, Starlink's innovative technology could serve to significantly close the digital divide in rural areas.

VII. Conclusions

In this paper, I've broken down how the digital divide in education reinforces societal disparities, results in lost potential for economic growth, and hinders students' educational outcomes. In an increasingly technology-dependent economy, those without the tools to participate will be left behind. Left without proper support, generations of people will inherit an economy that they themselves cannot participate in – a recipe for disaster. But that outcome is not inevitable. By treating digital access as a right, not a privilege, policymakers can close the gap and unlock every student's educational potential.

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