



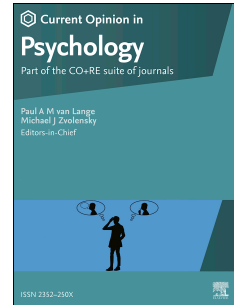
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What was a gap is now a chasm: Remote schooling, the digital divide, and educational inequities
resulting from the COVID-19 pandemic

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Abstract

COVID-19 resulted in the unexpected transition to remote learning for K-12 schools, exacerbating the existing digital divide and impacting the educational outcomes of marginalized youth. This article reviews literature on the impacts of the pandemic on the educational outcomes of marginalized youth due to remote learning and the digital divide. Here, we provide an overview of the pandemic and remote schooling from an intersectional lens, discuss the impacts of the digital divide on learning for students during the pandemic, then consider impacts on the delivery of special education supports. Additionally, we review literature on the widening achievement gap in relation to the COVID-19 pandemic. Future directions for research and practice are discussed.

Keywords: marginalized youth; achievement gap; systemic inequity; intersectional identities

What was a gap is now a chasm: Remote schooling, the digital divide, and educational inequities resulting from the COVID-19 pandemic

The COVID-19 pandemic brought an immeasurable amount of distress and hardship to the individuals and families across the globe whose lives were altered instantaneously. Schools were not immune to the changes as statewide mandatory lockdowns resulted in the abrupt transition from in-person learning to completely remote learning. In the age of technology, this adjustment, on the surface, seemed reasonable; however, the forced transition to remote learning amplified existing racial, socioeconomic, and educational disparities. The digital divide embodied existing inequitable access to resources that then had critical implications for students' educational outcomes during the pandemic. This article provides a review of recent literature on the educational impacts of COVID-19 in K-12 students with attention to the digital divide (i.e., unequal access to technology and the internet) and subsequent inequities in remote learning. Recommendations for future directions are also provided as they relate to research and practice, which continue to be impacted by the effects of the pandemic.

1.1 Intersectional Identities: Race, Class, and Remote Learning

The educational impacts of the COVID-19 pandemic due to remote learning and the digital divide are best conceptualized through an intersectional lens. Youth situated at the intersecting margins of race (i.e., racially minoritized) and class (i.e., working class/economically disadvantaged) in both rural and urban settings were significantly impacted by the transitions to remote learning during COVID-19. However, there are few researchers who take these intersecting identities into account when examining the educational impacts of the COVID-19 pandemic. Research instead focuses primarily on economic disparities in relation to educational outcomes and COVID-19.

During the early part of the pandemic, access to economic resources inarguably influenced the entire schooling process for youth and their families. For example, parents from many upper middle-class households had careers that afforded them the opportunity to work remotely [1], providing more opportunities for support and oversight for school-attending youth in the household. Contrastingly, many working-class parents who did not experience job loss continued to work outside of the home due [1, 2] to having jobs that identified them as “essential workers.” As such, adolescents in working-class families were not only required to attend to their own schooling with less structure and support but also to attend to younger siblings in the household [3]. Parents from working class or low-income households who were able to stay home with their children still experienced a myriad of challenges with homeschooling. For example, parents of elementary aged children in Hoskins and colleagues [4] study in London discussed difficulties with homeschooling including managing multiple children or responsibilities, unfamiliarity with topics, and lack of training in teaching. Additionally, relative to higher-income households, parents from low-income households experienced greater challenges with navigating resources for teaching their children [3, 5]. Lastly, while youth from middle class families may have had larger homes and/or more spaces within the home to learn without disruption, this was a challenge for youth from working class homes who may have had to share learning spaces with siblings who were also learning remotely [6].

It is important to note that class and race are not mutually exclusive (i.e., racial-wealth gap) given the history of economic oppression among people of color. Recent reports indicate that the racial-wealth gap between White and racially minoritized groups have remained steady in the U.S., with Black and Latino families most impacted [7]. Accordingly, Black and Latino communities endured some of the most detrimental impacts of the COVID-19 pandemic [8-10].

Relatedly, Black and Latino youth undoubtedly experienced the most drastic educational repercussions of the pandemic. In addition to the impacts of the racial-wealth gap on remote learning during the COVID-19 pandemic, the digital divide also served as a remote learning obstacle for many racially and socioeconomically disadvantaged youth [11].

2.1 The Digital Divide and Intersectional Identities

Unequal access to technology was not unique to the COVID-19 pandemic. This unequal access has been referred to as the “digital divide,” which disproportionately affects individuals from multiple intersecting identities and has persisted since the internet was created. One estimate suggested that 92% of all U.S. households had at least one computer, and 85% had an internet subscription in the year 2018 [12]. However, computer ownership and internet subscriptions were lowest among households who identified as Black and households where at least one member had a disability. Additionally, the digital divide does not only encompass access to computers and internet subscriptions, but also quality and source of access are also important. For example, prior to the pandemic, youth from low-income households were less likely to have internet access beyond their cellular devices, access to good quality internet in their areas [13], and may have had limited access to devices due to sharing with others in the household [4, 14]. Altogether, the digital divide pre-pandemic symbolized disparities in access to online extracurricular resources that could supplement students’ in-person learning; however, the COVID-19 pandemic shifted online learning from an auxiliary tool to the primary format for schooling, thus exacerbating these disparities.

Significant delays were noted in school districts’ abilities to provide technology to youth from marginalized backgrounds at the start of the pandemic [15]. Indeed, one study highlighted that only two-thirds of youth in U.S. households with incomes less than \$25,000 had computer

and internet access for their children to engage in remote schooling [14]. The lack of support for transitioning youth to remote learning resulted in the complete cancellation of schooling for some low-income youth and a mixture of paper packets and remote schooling for others [16, 17], which introduced complexities in where youth should focus their efforts and how assignments should be completed and submitted. For some youth and school systems, challenges with obtaining technology for remote schooling persisted into the 2020-2021 school year due to supply shortages and politics [18].

Unsurprisingly, inequities in access to computers and the internet prior to the pandemic extended the digital divide to disparate use of technology and the development of technological skills and literacy among students [18, 19], which likely impacted students' ability to engage in school-based online learning platforms, dividing time between learning the platform and learning the content being taught. Students with access to computers and the internet in their homes are more likely to use computers and the internet [20] and more likely to develop digital skills [21] that would allow them to quickly transition to remote learning and access learning platforms with ease. For example, teachers have described negative impacts to student engagement due to the digital divide during the COVID-19 pandemic, noting the desire to connect with students online to discuss late assignments but being unable to due to students' limited internet access [22]. Educators have also struggled to form relational bonds with students impacted by the digital divide, which may negatively impact their educational perseverance [22]. In short, students from these disadvantaged backgrounds, in addition to having limited and constrained access to instruction, may have also had to spend their time acquiring digital skills versus engaging in their schoolwork.

3.1 The Digital Divide and Special Education

The digital divide also impacted the education of students with disabilities during the pandemic and remote learning. During the height of the pandemic in 2020, an estimated 15% of students were identified as having a disability [23]. The Individuals with Disabilities Education Act (IDEA, 2004) necessitates a legal mandate for K-12 schools to implement Individualized Education Plans (IEPs), which provide specially designed formal supports for students. As part of their IEPs, many students with disabilities receive special education services which relied on specialized interventions, accommodations, and other supports to meet their goals. A lack of clear policies regarding the implementation of IEPs in virtual settings [24] and the abrupt shift to remote learning during the COVID-19 pandemic presented unique challenges for educators supporting students through service delivery [25, 26].

Recent reports suggest that students who qualified for special education services under different categories were differentially affected by barriers to service provision through IEPs. For example, students with emotional and/or behavioral disorders comprise a particularly vulnerable group, as they are significantly more likely to be suspended, expelled, and arrested compared to their peers with IEPs for other disabilities and students in general education [27]. One study found that beyond check-ins about social, emotional, and behavioral well-being, common emotional and behavioral strategies and interventions were not provided during the pandemic [28]. Abrupt stops to services could have harmed students by interrupting the learning of coping skills and access to a safe, supportive environment for sharing their thoughts and feelings. Indeed, school personnel are essential to students with disabilities academic and personal development.

Finally, students who have related services on their IEPs (including various therapies) and students who are deaf/hard of hearing or blind/with visual impairments often require

additional supports from service providers who may be itinerant or work part-time in the school system. In addition to the burden on the service providers to quickly shift their services to be delivered in a virtual format, students struggled to access these services due to inaccessible or non-existent technology (e.g., technology for teaching youth to read Braille) [29]. A lack of access to these supports may have likely hindered students' ability to keep up with instruction, thus resulting in detrimental impacts to youths' educational outcomes.

4.1 Educational Impacts of COVID-19 and Remote Learning

The abrupt change to remote learning and the exacerbated digital divide during the COVID-19 pandemic had widespread educational impacts; however, research is still emerging on the educational impacts of COVID-19 not only in the U.S., but in K-12 students across the world. Understanding the educational impacts of COVID-19 on youth requires researchers to not only consider academic achievement, but also academic-related experiences and behaviors (e.g., school engagement, motivation, etc.) that indirectly impact achievement. The amount of time that students spent learning virtually has been negatively associated with academic gains [36, 37]. This is interesting given that youth who attended school completely remote attended on average more days of school, suggesting that greater virtual attendance did not translate to more academic gains [36]. However, these findings are also unsurprising given that the in-person school environment provided an opportunity for many students to focus better on learning than what could be afforded in the remote-learning environment [38]. These findings are particularly important as racially marginalized students were more likely to continue learning virtually for longer periods of time compared to White students [39].

A 2020 projection of the pandemic's impact on academic impacts suggested that U.S. students would only make between 63 to 68% of the learning gains in reading and between 37 to

50% of the learning gains in mathematics relative to a typical school year [30]. This projection has been corroborated by emerging studies, which demonstrate that academic gains following the start of the COVID-19 pandemic were significantly lower than seen in the years prior [31, 32], with greater deficits noted in math, followed by reading [33]. Studies examining learning loss in primary school students noted that learning loss increasingly worsened by grade, with fourth and fifth grade students experiencing the most learning loss. Comparatively, a meta-analysis looking at studies from around the world [34] highlighted that older students (i.e., high school) fared better than younger students, suggesting that advanced elementary may have been a particularly sensitive developmental period for learning loss during the COVID-19 pandemic. It is important to note that youth who experienced educational challenges during remote learning, continued to experience challenges when returning to in-person schooling [35], suggesting that the educational consequences of the pandemic may persist beyond the return to in-person schooling.

An amalgamation of factors interacted to create significant barriers that have impacted and will continue to impact the educational outcomes of K-12 youth. For instance, the transition to remote learning created significant barriers and stressors for teachers that undoubtedly shaped students' academic outcomes. While many teachers already had access to technology, they were not always trained on how to engage their learners virtually or given adequate pedagogical support and resources for teaching online [38,40,41]. Some teachers also perceived little support and engagement from parents [42], which was important given teachers' limited access to support students more immediately. Additionally, while trying to navigate the digital environment for themselves, some teachers spent significant amounts of time troubleshooting technology issues with their students [38]. Given the technology issues experienced by teachers and students, as well as the unknown regarding appropriate workloads for students during this

transition, some teachers reported limiting the amount of new content they introduced to students [43] and ensuring mastery of previously introduced materials [38]. These factors resulted in an increased workload for teachers [44] and increased stress [41,45], which is associated with teacher burnout [46] and subsequently, turnover [47]. Overall, teachers grappling with the realities of virtual teaching endured barriers and stress that inevitably impacted their abilities to positively impact the educational achievement of students during COVID-19, comparable to prior years, which will be seen in the achievement of students in the years to come.

Students also had unique experiences and perspectives associated with the transition to remote learning that are consequential for their educational outcomes. In addition to some students experiencing the previously mentioned technology issues, students reported that communication with teachers was a significant barrier [48], which suggests that students' support for navigating the digital learning environment likely varied greatly from teacher to teacher. Increased amounts of schoolwork were also a challenge for students [49], contrary to reports from teachers that they sought to give less work. With the challenges that students were facing, they also felt less motivation in school [49, 50]. While studies assessing students' perspectives on learning during the pandemic are few, these studies demonstrate the unique barriers that may influence the academic outcomes of youth.

5.1 Widening of the Achievement Gap

Persistent racial, ethnic, and economic disparities in academic achievement among students in the U.S. reflect longstanding systemic inequities that maintain unequal access to academic resources and opportunities [51, 52], but the magnitude of the COVID-19 pandemic's impact on widening the achievement gap is unknown. Given the disparities noted due to the digital divide and the transition to remote learning, is it unsurprising that the achievement gap

has widened due to the COVID-19 pandemic. Early in the pandemic, preliminary research using qualitative analyses and small sample sizes prompted concern for how the pandemic might disproportionately affect academic achievement among minoritized students [18, 53, 54]. Emerging evidence from larger datasets suggests that the pandemic was associated with widespread learning loss, revealing unprecedented declines in both math and reading achievement [55, 56], including among minoritized students. Specifically, the pandemic resulted in greater score decreases in standardized tests among lower-performing students, students of color, and students from lower-income households [57, 58]. Furthermore, data from Spring 2019 to Spring 2022 revealed that Hispanic/Latino, Black, and American Indian/Alaska Native students evinced larger declines in reading and math achievement compared to their White and Asian American peers [57]. Data suggest that students are slowly recovering from pandemic-related learning loss, and it is estimated that students will require between one and more than five years to close the achievement gap [57, 59]. Because students in high-poverty schools experienced larger pandemic-related achievement declines—and likely have less access to high quality academic resources—these students are facing a wider achievement gap and will likely require more time to recover [57]. The full effects of rapid changes to educational instruction may not be ascertained for years to come. As such, it will be important for researchers to examine educational impacts within the context of the digital divide.

6.1 Future Directions

The exacerbated effects of the digital divide due to the COVID-19 pandemic and the abrupt transition to remote learning have widened the existing achievement gap. While studies clearly demonstrate this widening of the gap through examination of standardized testing, the effects of the exacerbated digital divide during the COVID-19 pandemic and the magnitude of its

impacts on youth's educational outcomes surprisingly remains largely unknown and unexplored. Future studies should examine additional indicators that influence academic achievement, such as academic behaviors. Gaining greater insight into various individual-level indicators that impact youths' academic outcomes will provide more clarity for targeted supports and interventions both individually and structurally (e.g., school-based programming). Additionally, there remains little empirical examination on the impacts of the pandemic on the academic outcomes of students with varying disabilities. Many youth with disabilities experienced significant interruptions in their education as many of their challenges persisted or worsened due to lack of appropriate resources for translating their supports to the remote learning environment. It is crucial to gain an accurate depiction of how these interruptions impacted youth with disabilities, as well as their families, academically, psychologically, and vocationally. Finally, despite the dearth of literature providing a holistic perspective of the academic impacts of the COVID-19 pandemic and remote learning, the widening achievement gaps based on race, socioeconomic status, and disability status call for state and federal legislation to support culturally relevant interventions to close both the achievement gaps and the digital divide. With the full implementation of remote learning, it is likely that digital literacy and the ability to access digital resources for learning will be a normative aspect of educating students and more important than ever before. As such, programming focused on technology access, digital literacy, navigating academic resources in digital spaces, and recovering learning loss will be crucial for the academic and vocational development of under-resourced youth emerging from the COVID-19 pandemic.

Declaration of Interest

The authors declare no conflict of interest.

Credit Authorship Contribution Statement

Alexandrea R. Golden: Supervision, Conceptualization, Writing – original draft, Writing – review & editing. **Emily N. Srisarajivakul:** Conceptualization, Writing – original draft, Writing – review & editing. **Amanda J. Hasselle:** Conceptualization, Writing – original draft. **Rory A. Pfund:** Conceptualization, Writing – original draft. **Jerica Knox:** Writing – original draft, Writing – review & editing.

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Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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