

TABLE OF CONTENTS

1. Introduction
2. Table 2
3. References

COVID-19, the Digital Divide, Distance Learning: Strategies and Policies to Avert an Education Crisis

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Introduction:

Existing digital disparities and COVID-19 combine to create primary and secondary risks for students. To slow the pandemic, schools around the world have closed and instead attempt to engage their students via distance learning. This has inverted the relationship between schools and households. Instead of schools functioning as the primary educators with homework and family assistance being supplemental, families are primarily responsible for facilitating academic learning. To alleviate the impact of the inversion, schools and districts in many developed economies have attempted to engage their students via distance learning. As a result, those households with meaningful internet access (Levine 2018) are able to minimize the immediate health risks by removing the need for students to venture outside to obtain materials or instruction.

COVID-19, the Digital Divide, Distance Learning: Strategies and Policies to Avert an Education Crisis

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May 2020

Existing digital disparities and COVID-19 combine to create primary and secondary risks for students. To slow the pandemic, schools around the world have closed and instead attempt to engage their students via distance learning. This has inverted the relationship between schools and households. Instead of schools functioning as the primary educators with homework and family assistance being supplemental, families are primarily responsible for facilitating academic learning. To alleviate the impact of the inversion, schools and districts in many developed economies have attempted to engage their students via distance learning. As a result, those households with meaningful internet access (Levine 2018) are able to minimize the immediate health risks by removing the need for students to venture outside to obtain materials or instruction.

The shift to technologically facilitated distance learning may reduce virus exposure for some, but it exacerbates disparities for others. Prior to the pandemic, in the “traditional” schooling model, computers and internet access were becoming increasingly imperative to academic achievement (Robinson et al., 2018, Gulek and Demirtas 2005, Jackson et al., 2006) in developed economies. Students without meaningful internet access (Levine, 2018) were able to obtain computer access from other locations in the pre-pandemic schooling model. But, with school buildings and libraries closed due to the pandemic, students have nowhere to turn to obtain lessons, assignments, and educational support. For them, more likely than contracting the disease is that educational disparities will be exacerbated due to the inability to access the educational materials and complete assignments (Kuhfeld & Tarasawa, 2020).

Disparities in teachers’ access to and literacy with technology will also impact academic performance. Kindergarten teachers may be able to print and mail worksheets, but by second or third grade, most schools have integrated technology into the curriculum.

Students’ ability to shift to effective distance learning is therefore dependent upon two overarching factors:

- 1) The technological sufficiency of the content producer (teacher, district, school)
The technological sufficiency of the content producer is the ability of a teacher to effectively create and distribute educational content. Depending on the educational system and school, technological sufficiency is related to educators’ digital literacies and skills, as well as access to technology. Therefore, disparities in teachers’ access to and literacy with technology will also impact academic performance during the pandemic, particularly in developed economies where there is greater, though varied, integration of technology into the curriculum. Those schools and districts that are unable to ensure technological sufficiency for educators may contribute to learning gaps and ultimately academic performance gaps as a result of inadequate remote learning. Even with their best efforts, teachers and schools with insufficient access to effective remote instruction channels will be unable to meet the challenges of remote learning during the initial wave of the COVID-19 pandemic.
- 2) The technological sufficiency of the content receiver (student/household)
The technological sufficiency of the content receiver is defined as the ability of the individual student to receive and understand the content, and where necessary use a computer to

complete and submit assignments. For younger students, this is strongly dependent on the involvement of the parent or caregiver.

Table 2 shows the likely student performance outcomes under a prolonged period of technology dependent distance learning. While the inclusion of the technological sufficiency is important, the technological level of the student and their household is likely the key determinant of achievement. In school systems with heavy reliance on technology to bridge the school to home gap, students with poor technological sufficiency are likely to be falling behind as they will not be able to participate at the same level as their connected peers.

Table 2. Likely Student Performance as Determined by Access to Digital Technologies¹

		Educational Content Consumer					
		Household Non-Digital Educational Capabilities ⁴ = HIGH			Household Non-Digital Educational Capabilities = Low		
		<u>Access to Digital Technology</u>			<u>Access to Digital Technology</u>		
		Full Access ²	Limited Access ³	No Access	Full Access	Limited Access	No Access
Education Content Producer ⁵							
Technology Capacity = High		At or Above Grade Level	Possibly Performing at Grade Level	Significantly Falling Below Grade Level	Possibly Performing at Grade Level	Significantly Falling Below Grade Level	Significantly Falling Below Grade Level
Technology Capacity = Low		Possibly Performing at Grade Level	Likely Falling Below Grade Level	Significantly Falling Below Grade Level	Significantly Falling Below Grade Level	Significantly Falling Below Grade Level	Significantly Falling Below Grade Level

¹ We recognize there may be some students who will dramatically exceed expectations and circumstances. Given prior research, we would expect the number of successful students to be minimal. This table covers the likely educational outcomes for all but the most extreme cases.

² Access is "meaningful internet access" (Levine 2018). It is a broadband connection necessary to connect with the teacher for full student engagement, be that video conferences or interactive lessons, a computing device sufficient to complete all tasks (a smartphone is not a sufficient device), and the skills to obtain assignments and otherwise engage with the teacher.

³ Access can be limited by suitability of device, or excess household demand for device time. Households with access only via smartphone will be limited in one manner, while households with more users than devices will be limited in a different fashion.

⁴ Household Educational Capability refers to the ability of a member of the student's household to understand how to complete a delivered lesson. This does not speak to the correctness of the completed work. This is independent of the technological capacity of the household.

⁵ Education Content Producer is the teacher/school/school district responsible for delivering the educational content to the household.

Students with higher levels of technological sufficiency, as well as students whose households provide plentiful multi-media materials and people as educational resources (Robinson and Schulz, 2013), are more likely to have positive outcomes with remote instruction necessitated by COVID-19. The constant is that students with greater and more varied resources will have multiple advantages over those whose resources are limited. The result is that distance learning dictated by COVID-19 will combine with the digital inequalities to exacerbate existing disparities in a stratified fashion. The strata will likely correlate with the traditional markers of disparity, household income, and educational attainment of the parents or home educator (Kim and Quinn, 2013), as well as stratification lines related to household media, digital media, and knowledgeable people as resources for educational attainment (Robinson, 2012; Kuhfeld & Tarasawa, 2020).

Addressing these issues is critical for students and educators. In the U.S., some students experience a “summer slide” where they lose approximately 20% of their literacy progress and 27% in math (Thum, & Hauser, 2015). Inadequate remote instruction in response to COVID-19 school closures combined with extended times away from formal classroom settings could generate an even greater “slide.” Further, disparities created in the short-term and left unaddressed will impact medium and long-term outcomes (Siraj-Blatchford 2004).

Interventions must be undertaken as soon and extensively as possible to avoid cementing long-term educational damage. The ad hoc efforts employed to bridge to the end of the school year need to be replaced by a more strategic, uniform approach. With many school districts anticipating another shutdown this fall, this summer schools can be better prepared for any future disruptions by immediately and systemically improving:

- 1) Household Technology Access
- 2) Content Production and Delivery
- 3) Household Non-technology Educational Capabilities
- 4) Summer Educational Interventions
- 5) Instructional Materials Design and Delivery

Where technology is used to facilitate distance learning, measures must be taken to ensure that teachers can easily and routinely produce and distribute lessons and instructional materials, and students can easily and routinely receive, complete and return the work. They must ensure that, not just some, but all students and teachers can use technology to engage in face to face conversations. Districts must work with those families who need assistance and provide them the training necessary to facilitate their child’s learning. Districts must engage with parents and provide materials and instruction to allow for intensive summer educational programming to stem the summer slide. On a longer time horizon, districts must work with educational materials producers to create materials that can be easily and seamlessly switched from classroom use to home use.

COVID-19 is a pandemic, but it can also be a focusing event (Kingdon, 1984) that can allow for interventions and improvements that might otherwise be inhibited by the bureaucratic and political obstacles. We have already seen that in the efforts of school districts to close the digital divide in the U.S. where successive governments have spent millions of dollars and more than a decade trying to close the divide. In response to COVID-19, in mere three weeks, Sacramento City Unified School District distributed 25,000 computers to students for use at home. Schools and school districts must apply that same focus to address the other factors on the list. Doing so now can help reduce the secondary COVID-19 exposure risk vulnerabilities and improve the use of technology in education when the immediate threat of COVID-19 subsides.

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