

# Inequality in Household Adaptation to Schooling Shocks:

## COVID-19-Induced Online Learning Engagement in Real Time

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### POLICY ISSUE

In March of 2020, as COVID-19 began spreading rapidly throughout the United States, schools across the country began closing their doors and transitioning to online learning. This unprecedented move to remote instruction resulted in a major disruption to students' education.

With schools closed, teachers and parents quickly turned to online educational resources as a substitute for in-person instruction. This change raised equity concerns given that an increased reliance on digital learning materials may disadvantage low-income students, who are less likely to have access to a computer, a high-speed internet connection, or parents with the time and training to oversee their learning. If this is the case, school closures could exacerbate already existing achievement gaps across socioeconomic status (SES).

This paper documents real-time changes in the intensity of internet searches for educational resources during the COVID-19 pandemic. Comparing internet search data from the spring of 2020 to baseline measures from the previous five years, we find that searches for instructional resources increased dramatically with the start of school closures, and that those increases were concentrated in areas with high SES. These findings suggest that school closures could worsen the student achievement gap, and that policies supporting greater access to technology and remote learning options are needed in low-SES areas.

### STUDY DATA AND FINDINGS

We use nationally representative search data from Google to track changes in search behavior in real time. We observe the search intensity of a list of commonly searched school-centered resources (e.g., "Google Classroom") and parent-centered resources (e.g., "math worksheets"), measured weekly from June 2015 through May 2020 and broken down into 210 geographic regions within the United States. We obtain measures of SES, such as

### KEY FINDINGS

- ^ 10% increase in the fraction of **households with broadband internet** was associated with an additional 50% increase in search intensity
- ^ 10% increase in the proportion of **rural schools** was associated with a 17% lower increase in search intensity
- ^ 10% increase in the proportion of **students who are Black** was associated with a 9% lower increase in search intensity

household income and percent of households with a broadband internet connection, from the U.S. Census Bureau's American Communities Survey.

Using the first four years of search intensity data, we establish baseline search intensity levels for school- and parent-centered instructional resources by week of the school year. We show that before the COVID-19 pandemic, search intensity was much greater for school-centered search terms, like "Google Classroom," than for parent-centered terms, like "home school" or "math worksheet." We then find that, by the end of March 2020, nationwide search intensity for all such resources had roughly doubled as compared to the same period in previous years.

Importantly, increases in search intensity were about twice as large for areas above-median SES than for areas below-median SES. In addition to the aggregate SES metric, increases in search intensity for school-centered online education materials were associated with levels of income, access to tech-

nology, school rurality, and racial composition:

- A \$10,000 increase in mean household income was associated with an additional 15% increase in search intensity
- A 10 percentage point increase in the fraction of households with broadband internet was associated with an additional 50% increase in search intensity
- A 10 percentage point increase in the proportion of rural schools was associated with a 17% lower increase in search intensity
- A 10 percentage point increase in the proportion of students who are Black was associated with a 9% lower increase in search intensity

## POLICY IMPLICATIONS

These findings provide early evidence that there were indeed socioeconomic disparities in access to and use of online learning resources as schools closed in response to COVID-19. While results from multiple surveys indicate that parents in higher SES households

self-report greater engagement with online learning materials than do their lower SES counterparts, this study is the first to use measures of actual online behavior to document this gap. These results lend support to the notion that school closures have the potential to widen socioeconomic achievement gaps and suggest that expanding access to technology and support for remote learning among low-SES households should be a priority in ensuring that students have equal access to learning opportunities.

With online learning likely continue to some degree during the 2020-2021 school year, future research using a similar approach could provide a moving picture of how households are responding to school closures as the year progresses. This study could also be replicated in other countries to gain a better understanding of how school closures have affected learning opportunities throughout the world.

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