

Ed tech and educational opportunity during the COVID-19 school closures

A case study of Chennai, Tamil Nadu



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1. Summary

The purpose of this study is to identify gaps and challenges in the use of education technology (ed tech) in Chennai, Tamil Nadu during COVID-19. Specifically, we investigated how use of ed tech differed by type of school (government or private), household socioeconomic status, and student gender—and how it changed during the COVID-19 school closures. Ultimately, we wanted to know how the use of ed tech may exacerbate or mitigate the unequal impact of school closures on student learning. Through phone surveys of 201 households and a total of 271 primary-school-aged children in February of 2021, we sought to understand households' educational practices in Chennai pre-COVID-19 and during the school closures. Our survey data showed that access to ed tech in schools and households before the pandemic was extremely limited and differed by household socioeconomic background and the type of school (government or private) children attended. Thus, we also explored educational activities from non-ed-tech sources that may have taken place.

Our survey findings indicate that during the pandemic-related school closures, students in private schools and those from high-socioeconomic status households have more access to digital devices and are more engaged in regular educational activities during COVID-19 than their peers in government schools and from low-socioeconomic status households; findings also indicate that girls are more likely than boys to have access to digital devices for learning and to engage in more regular educational activities. Unsurprisingly, parents turned out to be a major source of educational activities of young children during the school closures. Alarming, 1 in 5 children in our sample were enrolled in schools that do not offer any remote instruction during the school closures, and even among the children whose schools had begun remote instruction, only slightly more than half attended all the classes. Altogether, these preliminary results shed light onto a likely growing inequality of educational opportunity in India and around the world, suggesting the need for policymakers to broaden access to continuous and equitable learning opportunities across the student population.

2. Introduction

The COVID-19 pandemic has disrupted access to education and learning across the globe. At the height of the pandemic, over 1.5 billion learners were affected by the global school closures. In India, one of the most populated countries in the world, UNICEF recently reported that the COVID-19 school closures have impacted 247 million primary- and secondary-school students (UNICEF 2021). As a leader in large-scale education reform and ed-tech application among developing countries, India offers a fertile environment for this study's data collection. In addition, with one of the largest populations in the world, India offers great variation and lessons applicable to different contexts.

In India and across the world, school closures have compelled education systems to quickly devise and apply different modalities for remote learning such as radio, TV, and various types of online tools. But these modalities differ across and within countries—with students in high-income countries and communities much more likely to have access to online, virtual schooling, than their peers in low- and middle-income countries and communities (Vegas 2020). Thus, an important question is to what extent will student learning and progression in school, especially among primary-school-aged children in low- and middle-income settings, be affected by the global school closures? Further, how will the COVID-19 school closures cause inequality in learning among girls and boys, among poor and affluent children, and across communities and countries of varying income levels?

The purpose of this study is to identify gaps and challenges in remote learning with a focus on ed tech in ensuring continuity of learning opportunities and educator, student, and parent engagement in educational activities during the school closures. Our goal is to document the potential losses in learning opportunity caused by the COVID-19 pandemic, and to shed light on the need to develop strategies to address them as soon as possible to mitigate the long-term potential harm to children and their futures.¹ We are especially interested in understanding the extent to which children from households of different income levels engaged in educational activities during the COVID-19 school closures—and if so, the sources and modalities of educational activities, and their frequencies. To this end, we conducted a phone survey of households in the state of Tamil Nadu, India to understand whether (and if so, how) parents, schools, and teachers are supporting remote learning, the extent to which they are using ed tech to do so, and what challenges they faced.

Prior to the pandemic, a series of reforms introduced by the Indian government over the past 15 years, such as the Sarva Shiksha Abhiyan (SSA), mid-day meals, the Right to

¹ In a recent paper, we estimated the potential impact of the COVID-19 school closures on earnings and productivity globally (see Psacharopoulos, Patrinos, Collis, and Vegas, 2021).

Education (RTE) Act, and Rashtriya Madhyamik Shiksha Abhiyan (RMSA), had contributed to the expansion of access and student enrollment in primary and secondary school (Government of India 1999; Right to Education n.d.; “Rashtriya Madhyamik Shiksha Abhiyan (RMSA)” n.d.). India achieved near universal enrollment of 96% at the primary level by 2016 and made notable progress in expanding access to secondary education to different segments of the population. The national Ministry of Education’s new flagship scheme—Samagra Shiksha, launched in 2018—aims to provide holistic, integrated support to ensure quality of education at all levels of schooling (Samagra Shiksha, n.d.). Yet, Indian children and youth continue to face a number of challenges including inequality in schooling access, low learning outcomes, and high rates of student dropout, and the COVID-19 outbreak threatens to further reverse the gains from education reforms.

While technology has disrupted most sectors of the economy and changed how we communicate, access information, work, and even play, its impact on schools, teaching, and learning has been much more limited. In a recent Brookings report, we summarized the findings from rigorous evaluations of ed-tech interventions in low- and middle-income countries (Ganimian, Vegas, and Hess 2020). In a nutshell, simply distributing devices to students with little or no attention paid to how the technology will be used does not lead to improved learning. Instead, when interventions play to technology’s comparative advantages, they can help accelerate learning. And in our review of the evidence, we found that these comparative advantages include using ed tech to: (1) scale up quality instruction; (2) facilitate differentiated or personalized instruction; (3) expand opportunities for students to practice; and (4) increase student engagement. The COVID-19 pandemic has forced many students, teachers, and schools to use technology for learning in ways and at a scale previously unseen. It has also increased parental engagement in educational activities and shed light on how partnering with parents can expand learning opportunities (Winthrop 2020).

Yet, as our survey data show, access to ed tech in schools and households before the pandemic was extremely limited and differed by household socioeconomic background and the type of school (government or private) children attended. Thus, we also explored non-ed-tech sources and modalities of educational activities that may have taken place.

Our data indicate that after schools closed due to COVID-19, 1 in 5 of the children in our sample were in schools that offered no remote instruction. This fact alone causes great concern. Further, students from poorer households and government schools were less frequently engaged in educational activities and had more limited access to educational resources than their peers from more affluent households and private schools. Thus, it is very likely that more disadvantaged children will suffer greater learning losses during the pandemic-related school closures than their more advantaged peers.

At the time of this writing, India is facing a second, tremendous wave of COVID-19, resulting in hundreds of thousands of daily new infections and tragic deaths across the country. While we focused on educational opportunity, we cannot overlook the socio-emotional needs of children, especially in these trying times, and we hope to address these issues in future research.

3. Study design

Our study is based on a phone survey of a random sample of households with primary-school-aged children in the Indian city of Chennai. Chennai is the largest urban center in Tamil Nadu state and is India's sixth most populous city. As a result of Chennai's dense population, families typically have several nearby private and government school options, which provide a ripe setting to explore how the use of education technology differed between government and private schools—both prior to and during the COVID-19 pandemic.

To understand the educational practices of households in Chennai pre-COVID-19 and during the COVID-19 school closures, we conducted phone surveys of 201 households and a total of 271 primary-school-aged children in February of 2021. We drew our sample from a dataset that includes 3,035 households that were part of the Tamil Nadu Integrated Child Development Scheme (TNICDS), and from which our collaborator, J-PAL South Asia, had previously conducted in-person surveys. The TNICDS study had administered an in-person survey to 1,951 households of children attending *anganwadi* (early childhood) centers in Chennai (all of which have a listed phone number for the mother and/or father). Of those households, 665 have a primary-school-aged child (at least age 6). For this survey, we drew a simple random sample of 200 “primary” households and another simple random sample of 20 households where we piloted a preliminary draft of the survey and ordered the remaining households for “replacement” (to replace “primary” households if they could not be reached, for example, because the available phone number were disconnected, changed, or unreachable). The TNICDS data includes 14 indicators on household assets, and we used principal components analysis to generate a household index of socioeconomic status (SES). Using these data, we then divided the sample into two SES categories: low SES and high SES.² “SES”

² During the TNICDS survey, information on asset indicators was collected. Specifically, the survey asked if the households possessed the following assets: telephone/mobile; radio; television; cycle; car; scooter; computer; table; electric fan; refrigerator; bed; electricity; chair; and air conditioner. Using the principal component analysis, each household was assigned an asset index score. All those households with an asset index score below the median score were categorized as low SES households, and all those above the median score were categorized as high SES households.

is used interchangeably with “household income” in the survey and throughout this paper.

Our main respondents were the primary caregivers of the children, and the survey questionnaire included questions related to ongoing school practices during COVID-19; availability of digital devices for learning; use of ed tech before and during school closures; the types and duration of activities assigned during school closures; the level of supervision by teachers; and children’s and parents’ engagement in their children’s educational activities.

4. Sample characteristics

As Table 1 shows, our final sample included 201 households and 271 primary-school-aged children. The ages of children in the sample ranged from 4 to 11 years. Only one child in our sample had never been enrolled in school, and five children were not enrolled in school during COVID-19 but had been enrolled prior to the onset of the pandemic. Because we were interested in understanding students’ educational experiences before and during COVID-19, we excluded from our analysis the child who had never been enrolled in school.

Table 1. Summary of key variables

Variable	Frequency	Percentage
Gender of the child		
Male	130	48.0
Female	141	52.0
Total	271	100.0
Current enrollment status		
Enrolled	265	97.4
Not enrolled	6	2.6
Total	271	100.0
Type of school		
Government	88	32.5
Private	182	67.2
Child never enrolled	1	0.4
Total	271	100.0
Medium of instruction		
English	230	84.9
Tamil	39	14.4
Malyalam	1	0.4
Child never enrolled	1	0.4
Total	271	100.0
Socioeconomic status of households		
Low	101	50.2
High	100	49.8
Total	201	100.0
Primary caregiver		
Mother	148	73.6
Father	47	23.4
Aunt	2	1.0
Grandmother	3	1.5
Sister	1	0.5
Total	201	100.0

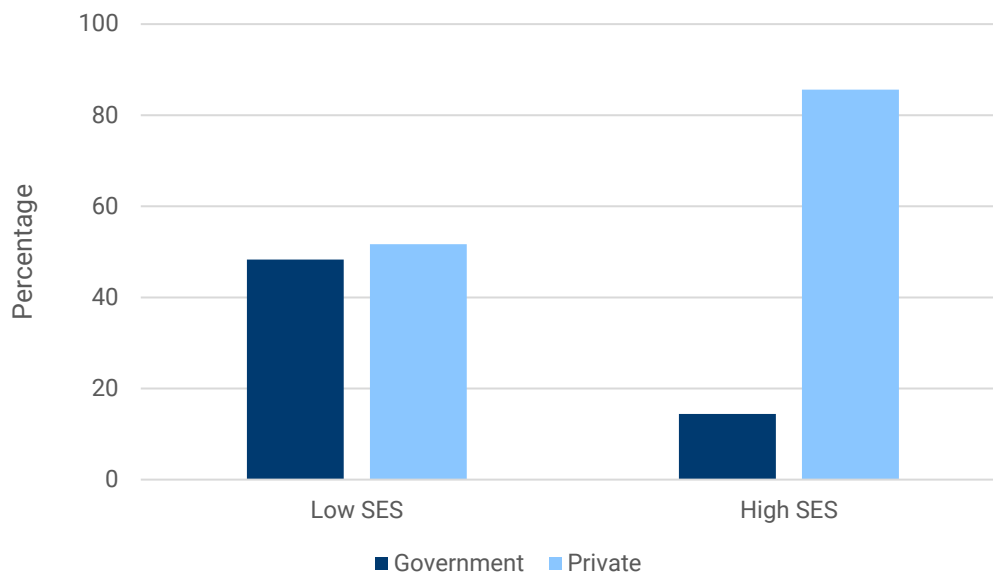
Table 1 shows that our sample is evenly divided by SES, with approximately 50% of children in low-income households and another 50% from high-income households. For close to three-fourths (74%) of children in our sample, the mother serves as the primary caregiver, followed by the father, who serves as primary caregiver for nearly one-quarter (23%) of children. By gender, our sample has slightly higher representation of girls (52%)

than boys (48%). In the analyses that follow, we only report differences by gender, type of school, and/or household SES when they are statistically significant.

Distribution of children by socioeconomic background across government and private schools

Prior to COVID-19, children from low-income backgrounds were equally likely to attend private or government schools. Yet, their peers from high-income backgrounds were much more likely to attend private schools. As Figure 1 shows, the proportion of children from low-SES households in both type of schools is not very different. By contrast, only 14.4% of children from high-SES households were enrolled in government schools, while 85.6% of children from these households were enrolled in private schools.

Figure 1: School enrollment prior to COVID-19, by type of school and household income



Source: February 2021 Brookings phone surveys.

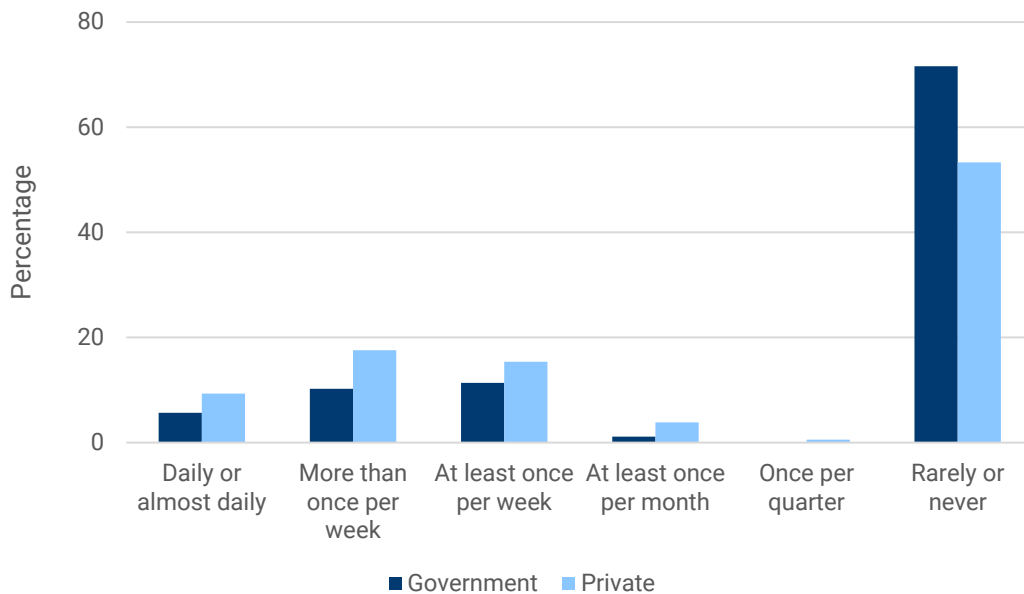
In India, government schools are divided into regular government (-funded and -managed) schools and government-aided, privately managed schools. We explored the extent to which children attend private, government-aided schools as compared to private schools that do not receive any government funding. The majority (67%) of children in our sample attended private schools that do not receive any government funding, while 26% of the children in our sample attended regular government schools, and only 7% attended private, government-aided schools.

Ed-tech use before the COVID-19 school closures

Before COVID-19, the use of digital devices such as computers, laptops, and tablets in classrooms was limited. The respondents reported only 8% of students used digital devices daily or almost daily, 15% used digital devices more than once per week, 14% used them at least once per week, and 3% at least once per month. Across our sample, respondents stated that 59% of students rarely or never used digital devices in their classrooms.

A similar pattern was reported for students in both government and private schools, but ed-tech use was always reported higher among students in private schools than their peers in government schools. As Figure 2 shows, 72% of students in government schools used digital devices rarely or never compared to 53% of students in private schools who used them rarely or never.

Figure 2: Percentage of usage of digital devices in classrooms prior to COVID-19



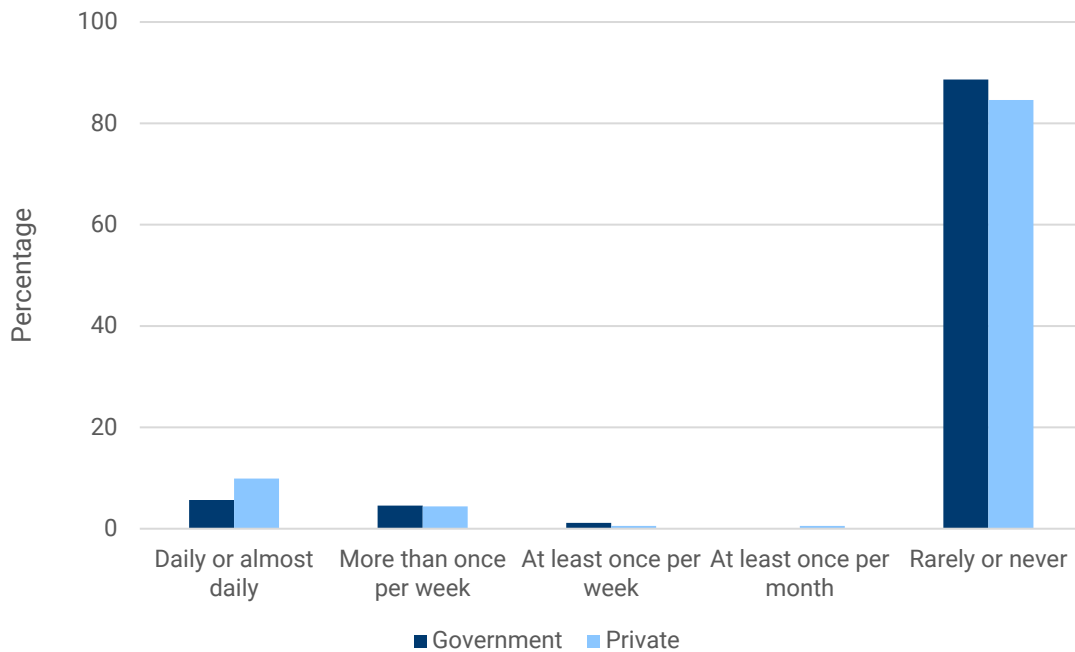
Source: February 2021 Brookings phone surveys.

Prior to the COVID-19 school closures, ed tech was seldom used outside of classrooms to complete homework assignments and/or to engage in learning activities, and none of the 270 children in our sample were provided with a laptop/netbook, smartphone, or tablet to learn at home.

Nevertheless, prior to COVID-19, around 14% of children used educational websites or platforms (such as Khan Academy, Mindspark, Youtube, or Google) before or after

school (See Figure 3). Still, 89% of children enrolled in government schools rarely or never used websites/software, and 85% of children in private schools also rarely or never used them. Access to educational websites or platforms prior to the COVID-19 school closures did not vary by household income or gender.

Figure 3: Percentage of usage of websites or platforms before or after school prior to COVID-19, by type of school



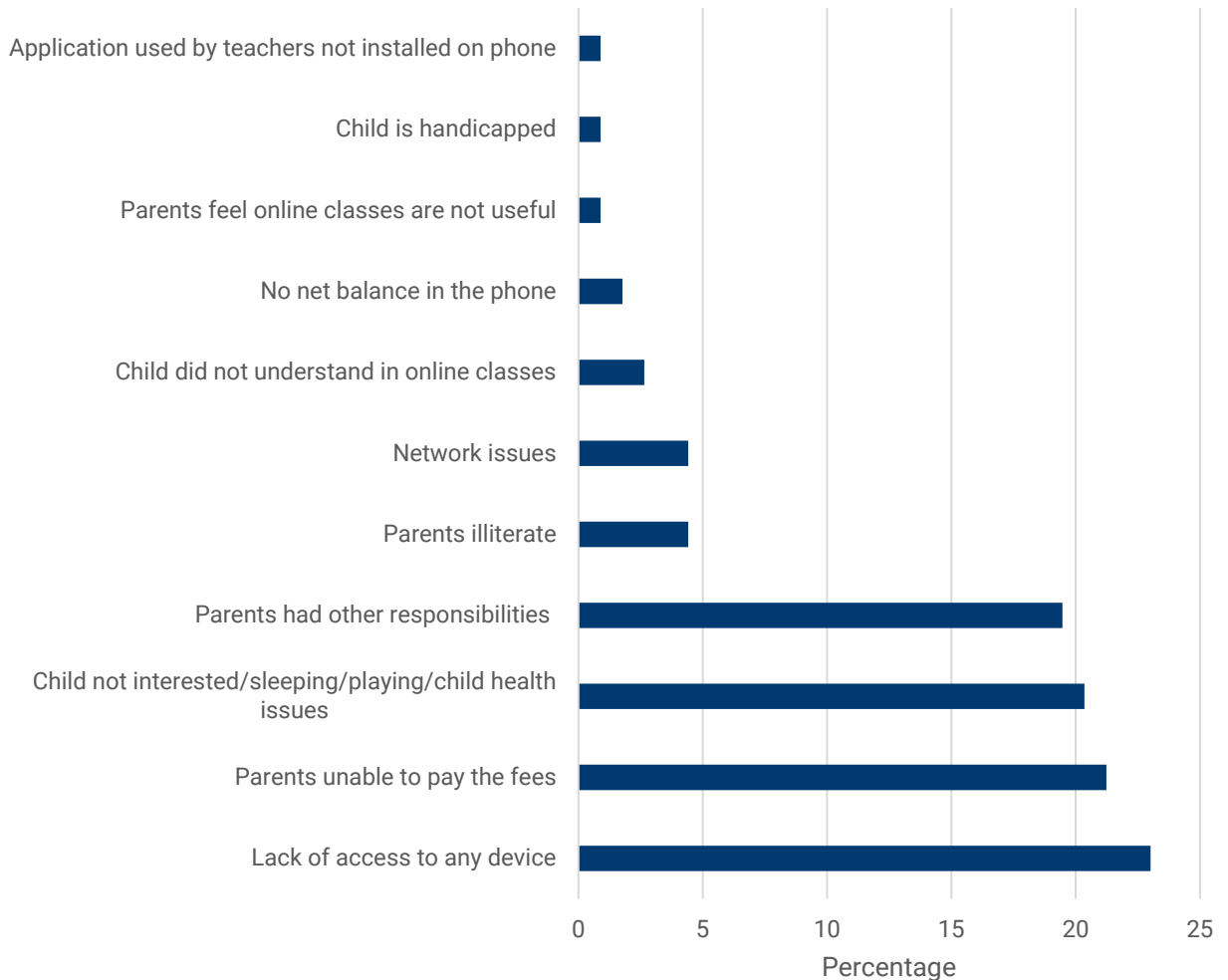
Source: February 2021 Brookings phone surveys.

Student frequency of educational activities and access to ed tech during the COVID-19 school closures, by key student characteristics and type of school

The COVID-19 school closures had significant effects on enrollment and engagement in educational activities among primary-school-aged children. After schools closed, parents reported that 5 children, or 2% of our sample, discontinued their school enrollment. Of the remaining children in our sample, respondents shared that 1 in 5 children attended schools that were not offering any type of remote instruction, while four out of five (82%) were in schools that had begun some type of remote instruction. Among the children whose schools had begun remote instruction, only slightly more than half (57%) attended all the (remote) classes and close to 1 in 5 (19%) did not attend any (remote) classes. The rest of respondents reported that their children attended most or some (remote) classes.

The main reasons reported for why children did not attend remote instruction regularly included parents' inability to pay school fees and lack of access to devices. Other reasons included primary caregivers' having other responsibilities, children disinterested in online classes, children unable to understand the material in online classes, health issues, network issues, and parents' illiteracy (see Figure 4).

Figure 4: Reported reasons why children did not attend classes regularly during COVID-19

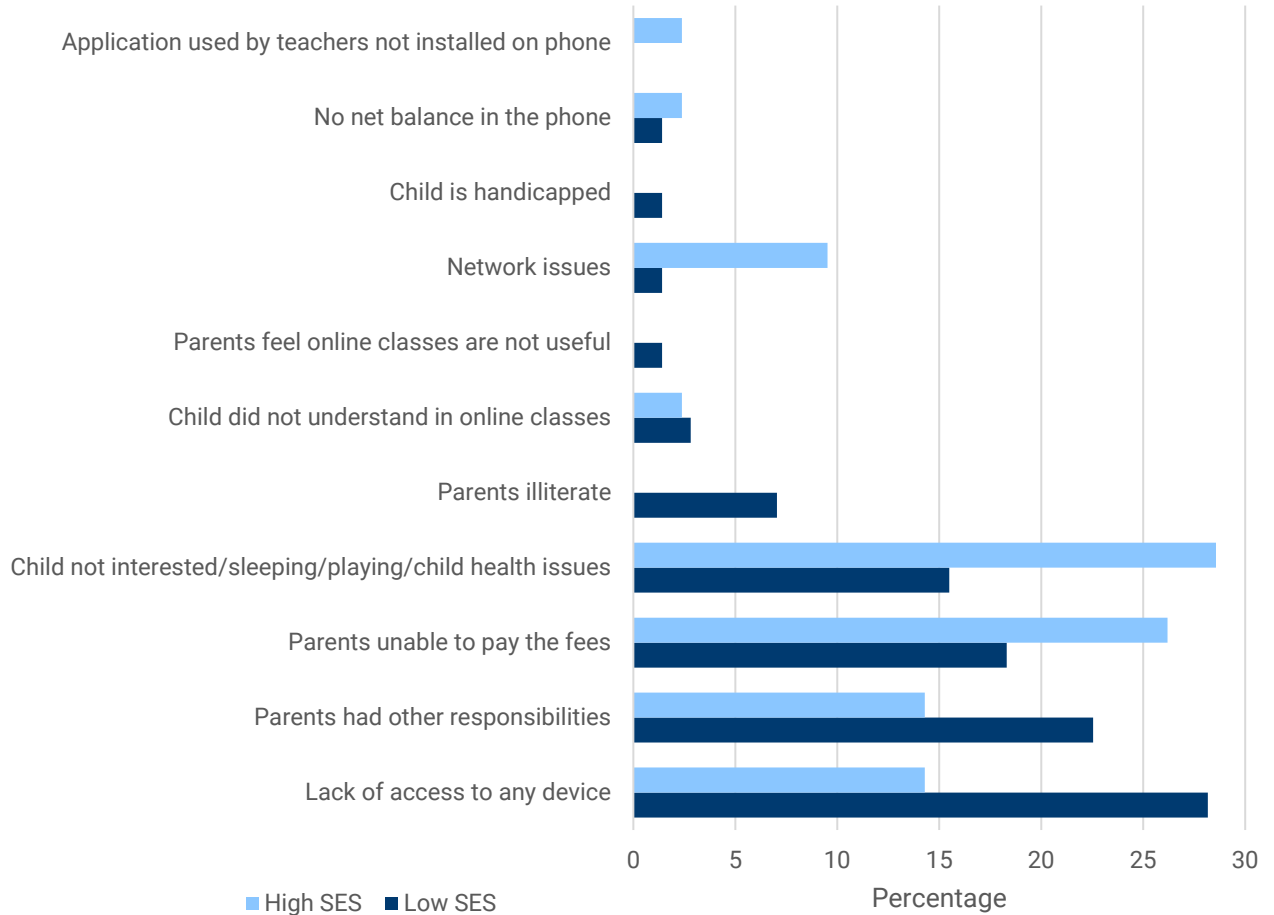


Source: February 2021 Brookings phone surveys.

Among children in low-income households, the two top barriers were lack of access to a device and parents having other responsibilities (see Figure 5). By contrast, among children in high-income households, the two top reported reasons for missing classes were the child having other interests or activities and parents' inability to pay the school fees. This last finding suggests that private, unaided school fees can be significant and,

in times of budget constraints to the household, may become an important barrier to school access.

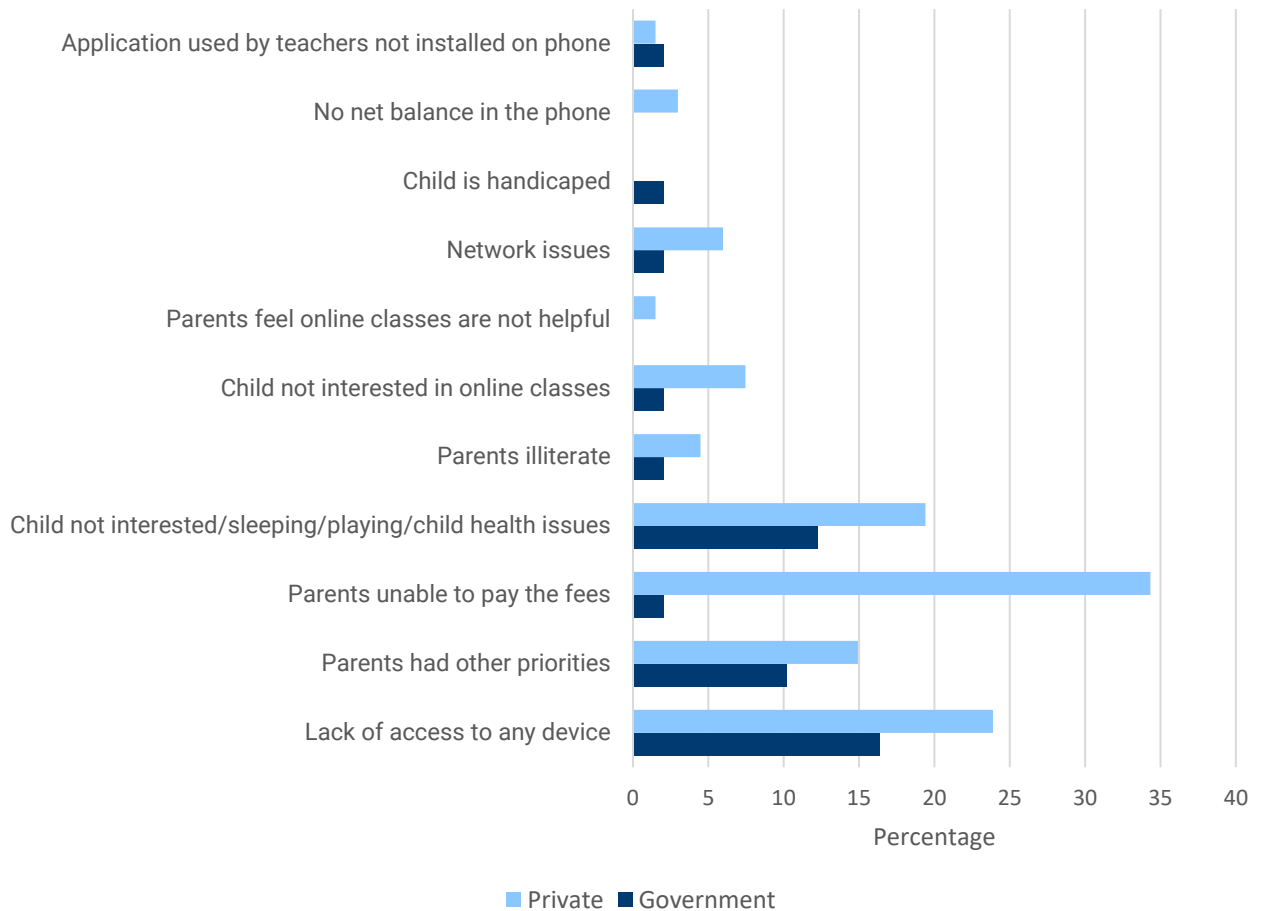
Figure 5: Reported reasons why children did not attend classes regularly during COVID-19, by household income



Source: February 2021 Brookings phone surveys.

Of possible causes, private school children were most likely to miss classes because their parents were not able to pay school fees (see Figure 6). Their parents also reported that, compared to government school children, they were more likely to miss lessons due to lack of access to a device, being disinterested, and having health problems. Further, a higher share of private school children’s parents reported having priorities other than teaching their children compared to government schools.

Figure 6: Reported reasons why children did not attend classes regularly during COVID-19, by school type



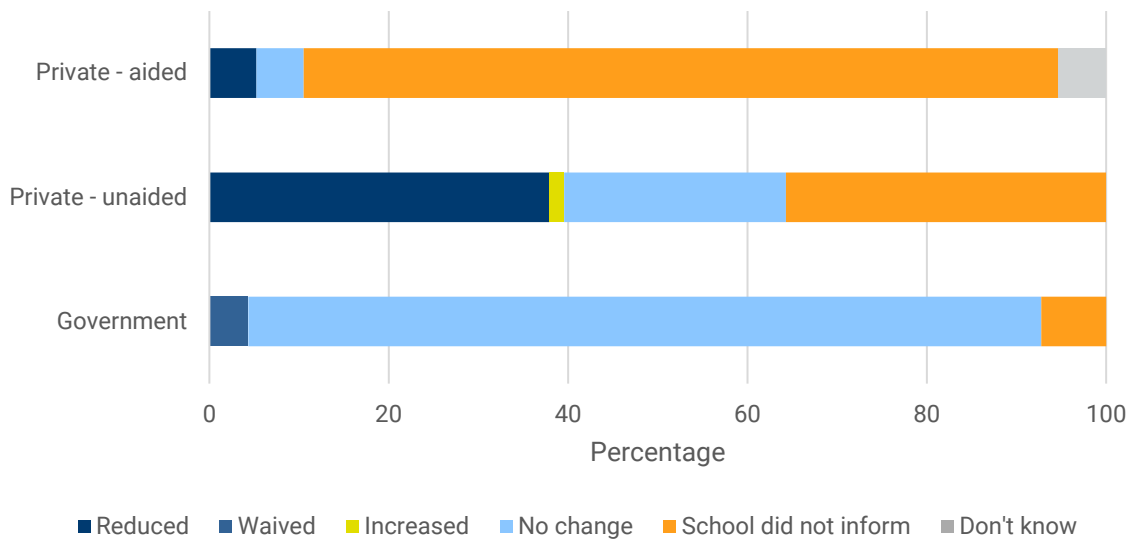
Source: February 2021 Brookings phone surveys.

Indeed, as in many low-income countries, throughout India it is common for primary schools (including government and private schools) to charge fees. A recent systematic review of the evidence on the impact of eliminating school fees in low-income countries found that abolishing school fees is associated with higher school enrollment (Morgan, Petrosino and Fronius, 2014). Especially during a pandemic, when families are also experiencing economic shocks, changes in school fees may affect student participation. Thus, we asked our respondents about the extent schools changed fees during the COVID-19 school closures.

Among parents of children attending government schools, it is reassuring that a great majority (over 90%) reported that the schools either did not change the fees charged or did not inform them of an upcoming change. Similarly, among parents of children

attending government-aided private schools, a great majority (around 90%) reported that the schools either did not change the fees charged or did not inform them of an upcoming change, and 5% even reported that the schools had reduced the fees charged. Perhaps surprisingly, among parents of children attending private schools that do not receive government aid, close to 40% reported that schools reduced the fees charged, and the rest reported that the fees were either unchanged or there was no information provided about a change in fees (see Figure 7).³ This suggests that for families who enroll their children in private, unaided schools, the size of the school fees may be more significant and may become a barrier to student enrollment in times of economic crisis. Indeed, recent research has documented that many families around the world have moved from private to public education in response to the pandemic (Alam & Tiwari, 2021; Ghanghar, 2021; Phadnis, 2020). We further explore this question below by analyzing changes in school enrollment during the COVID-19 school closures by type of school.

Figure 7: Change in the fees during COVID-19, by type of school



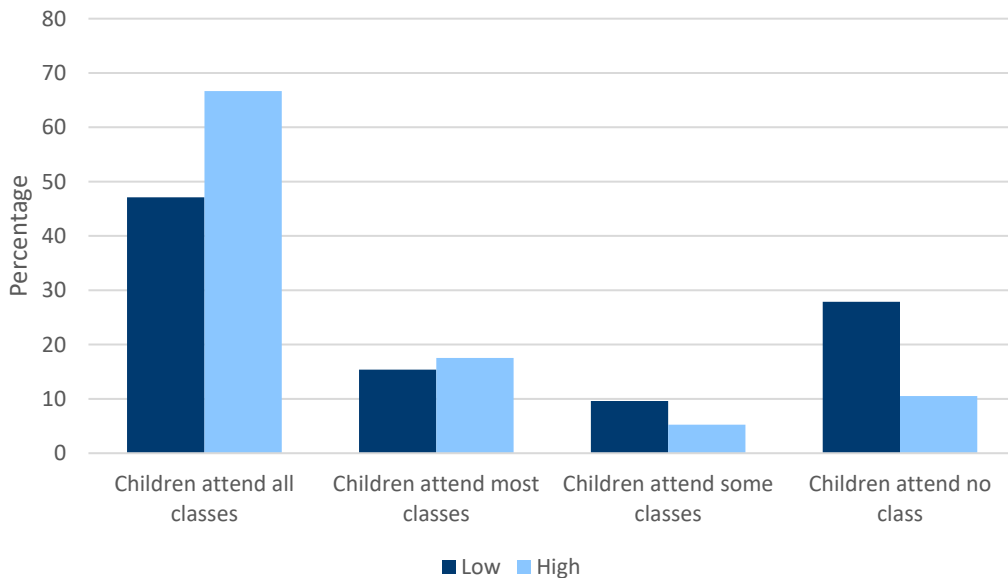
Source: February 2021 Brookings phone surveys.

Student engagement (as measured by class attendance) during the COVID-19 school closures varied by household background, with students from high-income households engaging more. A greater percentage of children from high-income households were

³ Because they are both financed by government, in our analyses, we included government-aided private schools in the category of government schools.

reported to attend all classes as compared to children from low-income households (see Figure 8). Conversely, more than twice the children from low-income than high-income households were reported to attend no classes. We find a similar relationship in engagement by school type. A higher percentage of children attending private schools were reported to attend all classes as compared to children attending government schools. Meanwhile, the children from government as compared to private schools were more likely to attend no classes.

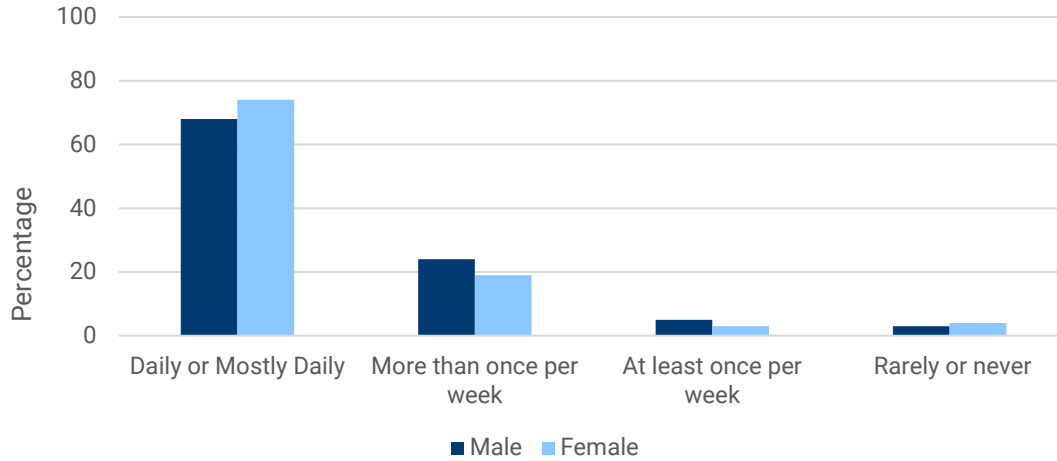
Figure 8: Attendance in remote classes during COVID-19, by household income



Source: February 2021 Brookings phone surveys.

While we did not find any differences between girls and boys in attending remote classes, girls were reported to be engaged in educational activities more frequently than boys, regardless of the type of school they attended. For example, compared to boys, girls were reported to be slightly more likely to engage in educational activities daily or mostly daily (74% and 68%, respectively). This is unlikely to be affected by school type as the gender makeup of government and private schools in our sample is not statistically different. Conversely, more boys than girls were reported to engage in educational activities more than once per week. It is somewhat promising that few children of either gender rarely or never engaged in educational activities (see Figure 9).

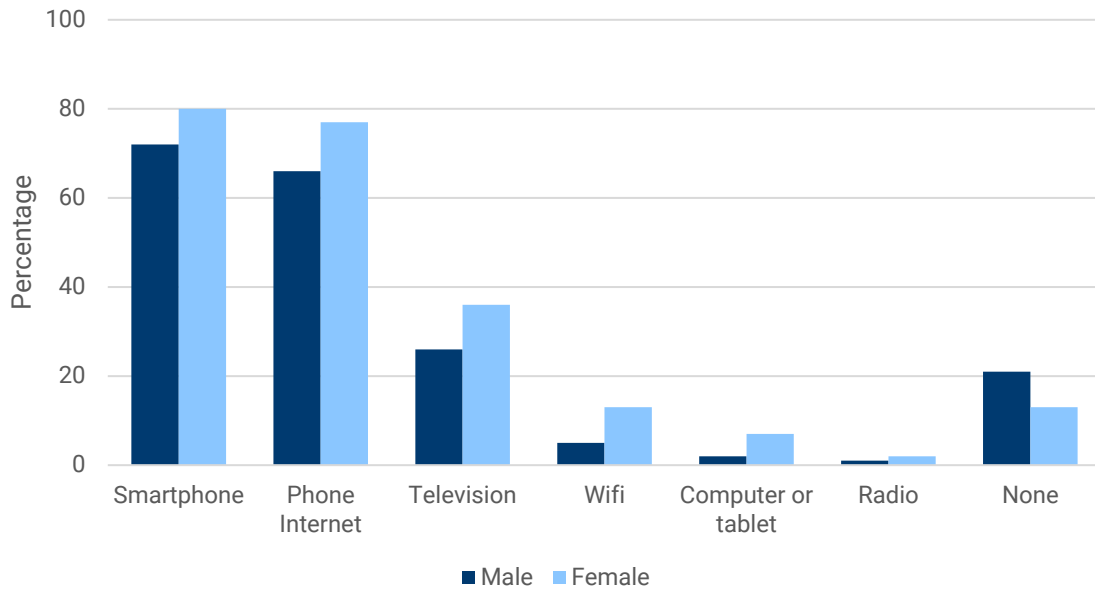
Figure 9: Frequency of engagement in educational activities, by gender



Source: February 2021 Brookings phone surveys.

Girls were reportedly more likely to have access to most educational resources that were included in the survey. For example, parents of girls were 11% and 8% more likely to state that their daughters had access to an internet phone or a smartphone, respectively, than were parents of boys. In contrast, parents of boys were 10% more likely than those of girls to report that their sons had access to television for learning purposes (see Figure 10). This difference is consistent among government and private school students indicating that girls are more likely to access educational resources regardless of economic status or school type.

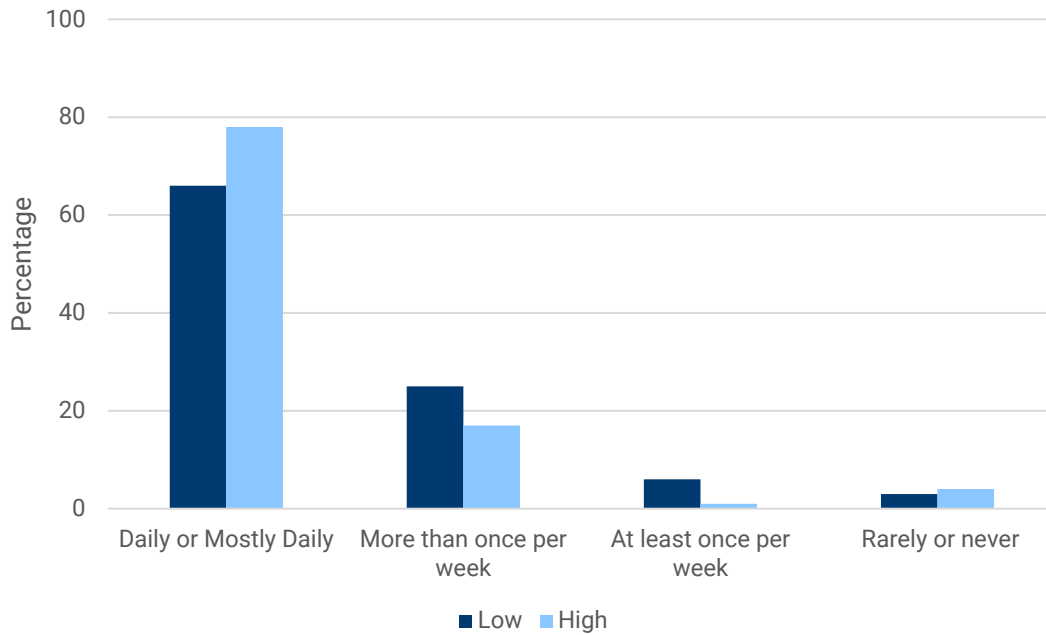
Figure 10: Share of students with access to educational resources by gender



Source: February 2021 Brookings phone surveys.

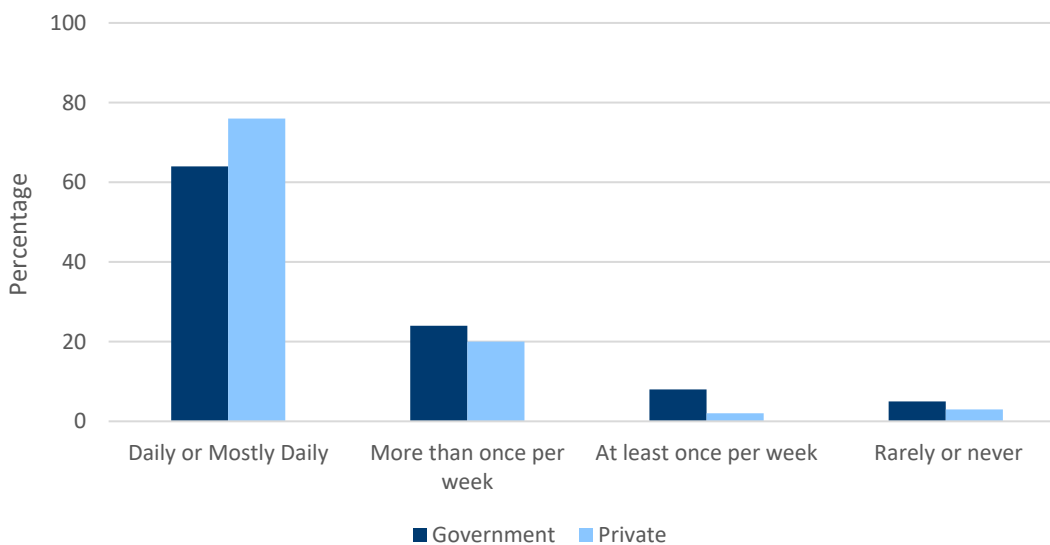
The data suggest that learning inequality by household income background is likely to grow as a result of the COVID-19 school closures. For example, children in high-income households and in private schools had higher reported frequency of engagement in educational activities than their peers from low-income households and in government schools (see Figures 11 and 12).

Figure 11: Frequency of engagement in educational activities, by household income



Source: February 2021 Brookings phone surveys.

Figure 12: Frequency of engagement in educational activities, by school type

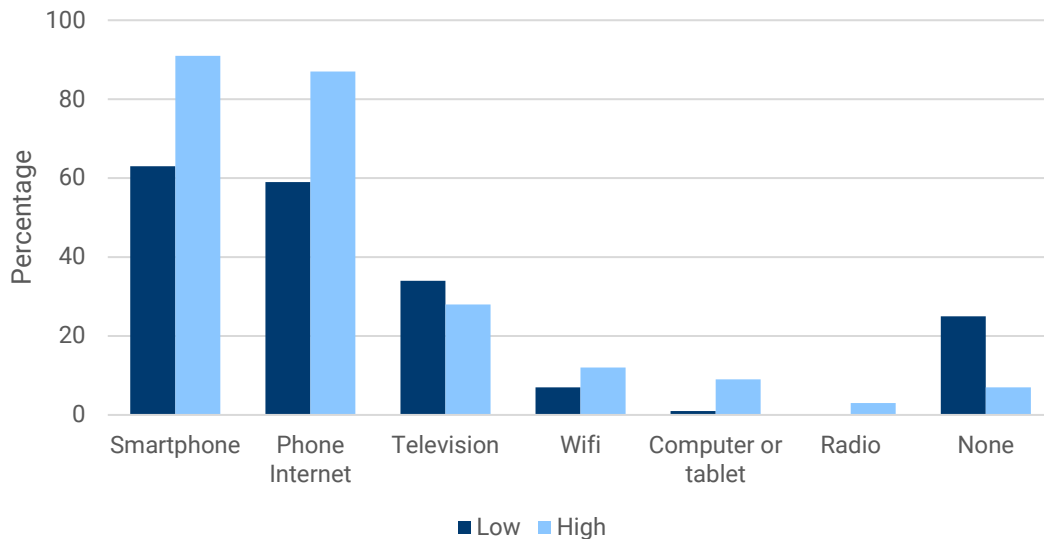


Source: February 2021 Brookings phone surveys.

Compounding these differences in frequency of engagement in educational activities, the data also suggest differences in the quality of access to educational resources by household income. For example, Figure 13 shows that students in high-income

households were reported to have better access to each resource, except for television. Conversely, while students from low-income households were reportedly 6% more likely to have access to a television, their peers from high-income households were reportedly 29% more likely to have access to a smartphone and 27% more likely to have access to an internet phone. Concerningly, students from low-SES households were reportedly 18% more likely to have no access to any of the educational resources included in our survey.

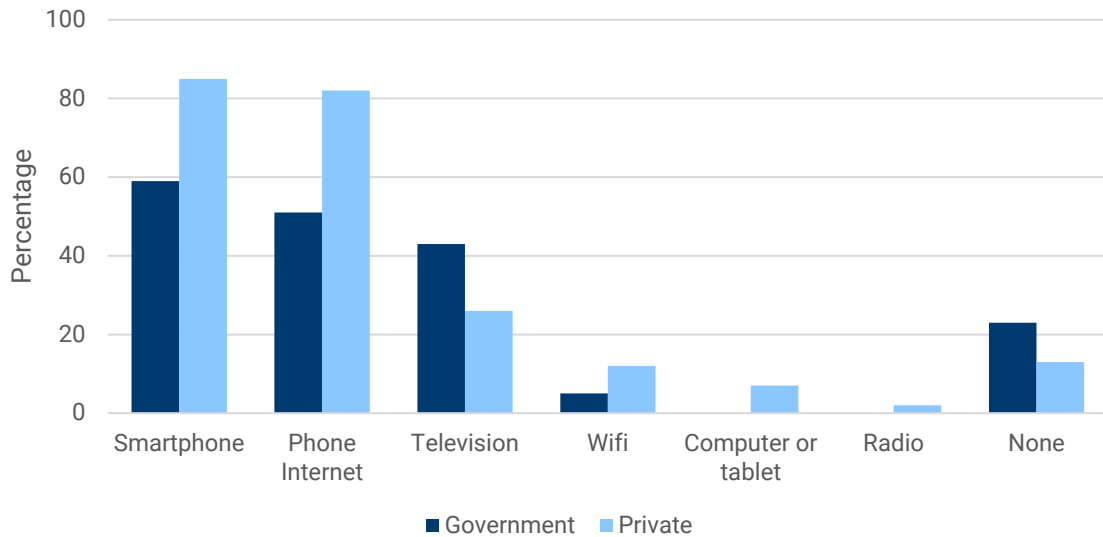
Figure 13: Share of students with access to educational resources by household income



Source: February 2021 Brookings phone surveys.

Also, as Figure 14 shows, our respondents indicated that private school students were more likely to have access to each resource except for television, and government school students were 17% more likely to have access to a television. The difference between private and government school students is largest with respect to access to smartphones (26%) and internet phones (31%). Very few students from either school had access to computers, tablets, radio, or Wi-Fi capability. It is troubling that government school students were reportedly 10% more likely than their peers in private schools to have no access to the educational resources included in the survey.

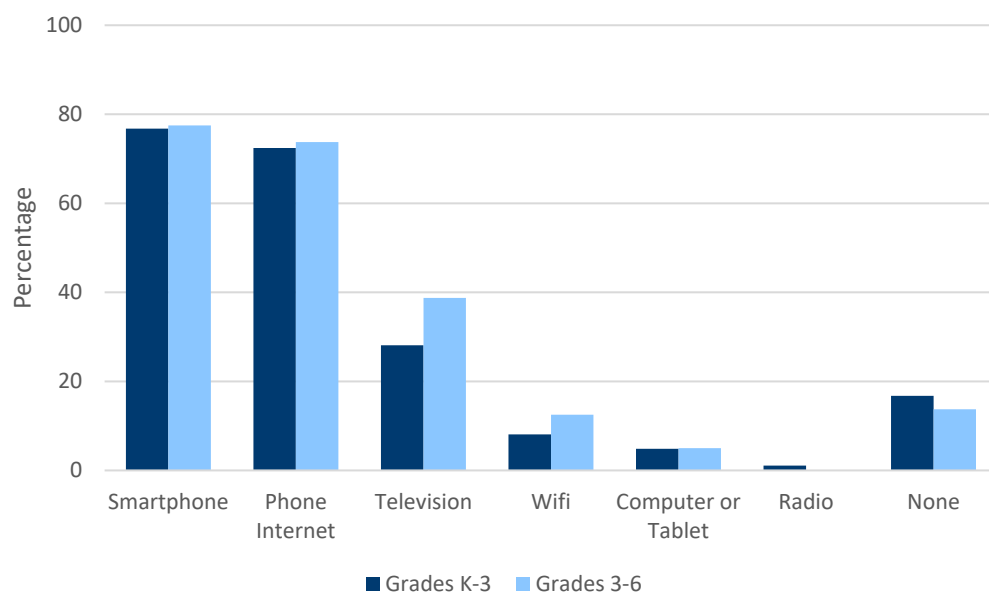
Figure 14: Share of students with access to educational resources, by school type



Source: February 2021 Brookings phone surveys.

Students in higher grades were more likely to have access to each educational resource, with the greatest differences in access to television and Wi-Fi (see Figure 15). There were also small differences among access to the uses of smartphones and computers. Overall, students in grades K-3 were 3% less likely to have access to any electronic education resource compared to students in grades 4-6.

Figure 15: Share of students with access to educational resources, by grade level

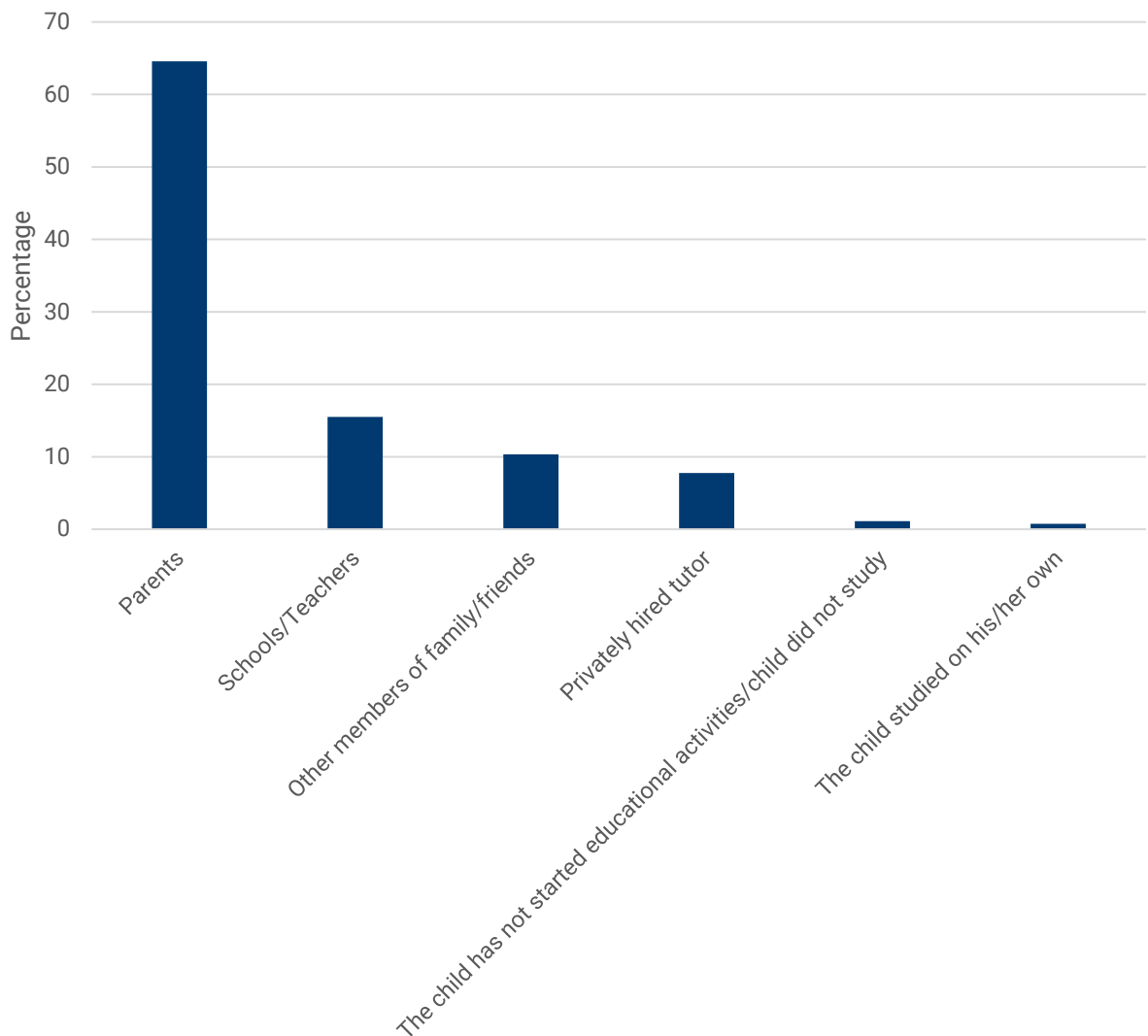


Source: February 2021 Brookings phone surveys.

Sources and modalities of remote instruction during the COVID-19 school closures, by key student characteristics and type of school

Unsurprisingly, parents turned out to be a major source of educational activities of young children during the school closures, while schools and teachers were reported as a main source of educational activities for only 15% of children. Few children studied on their own, and some children did not study at all or did not start any educational activities (see Figure 16).

Figure 16: Students' primary source of educational activities

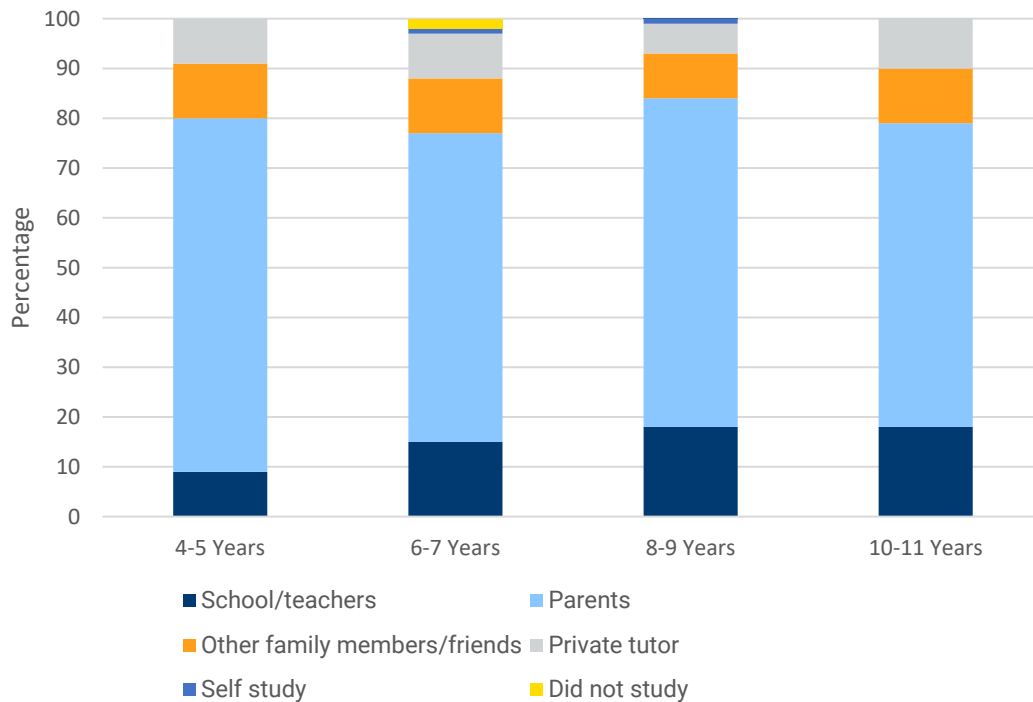


Source: February 2021 Brookings phone surveys.

But the data suggest that the source of educational activities differs by children's age, especially between schools or teachers and parents—as children age, schools or teachers become slightly more important to their education. For example, among

children ages 4-5 years, 71% were reported to have parents as their primary source of educational activities, and only 9% to have schools or teachers as their primary source. Among children ages 6-7 years, parents report that they were the primary source of educational activities for only 62% of children, and schools or teachers as the primary source for 15%. The percent of children who reportedly had schools or teachers as the primary source of educational activities further increased in the 8-9- and 10-11-years age group (to 18%); see Figure 17.

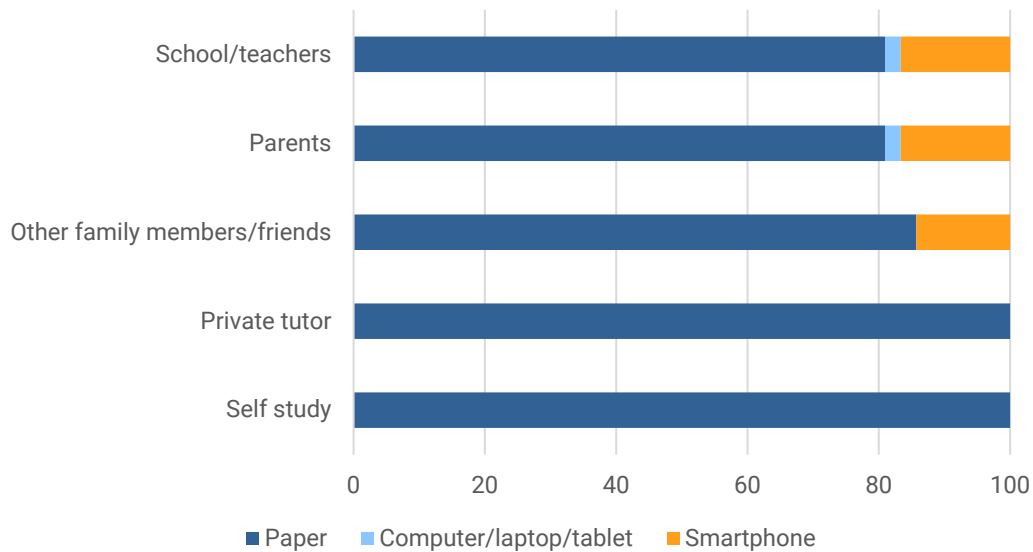
Figure 17: Source of educational activities during COVID-19 by children’s age



Source: February 2021 Brookings phone surveys.

As mentioned above, prior to COVID-19 the use of digital devices to complete educational activities at home was limited. Figure 18 shows that this situation did not change during the pandemic-related school closures, when most children were reported to complete educational activities by paper, and personal devices (computer/laptop/tablet) were reported as the least used modality.

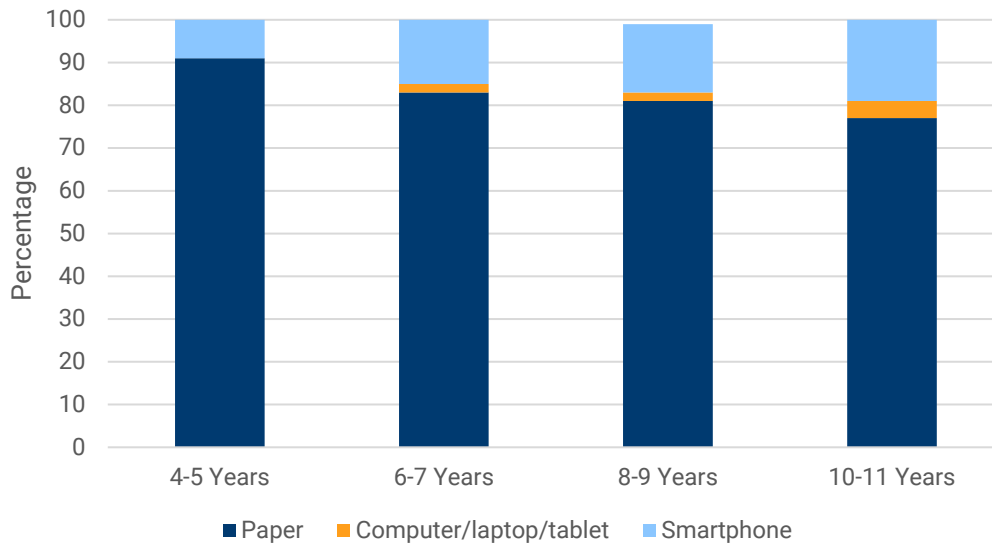
Figure 18: Modality of completing educational activities, by primary source



Source: February 2021 Brookings phone surveys.

However, the modalities used to complete educational activities differed by children’s ages. While most children were reported to complete educational activities using paper, the pattern of usage of various modes differed across age groups. Among older children, the reported usage of paper was lower and the reported usage of devices, such as smartphones and computer/laptops/tablets, was reportedly higher (see Figure 19). This suggests that ed tech can be more effective in ensuring remote learning opportunities among older children.

Figure 19: Modalities of completing educational activities during COVID-19, by age group



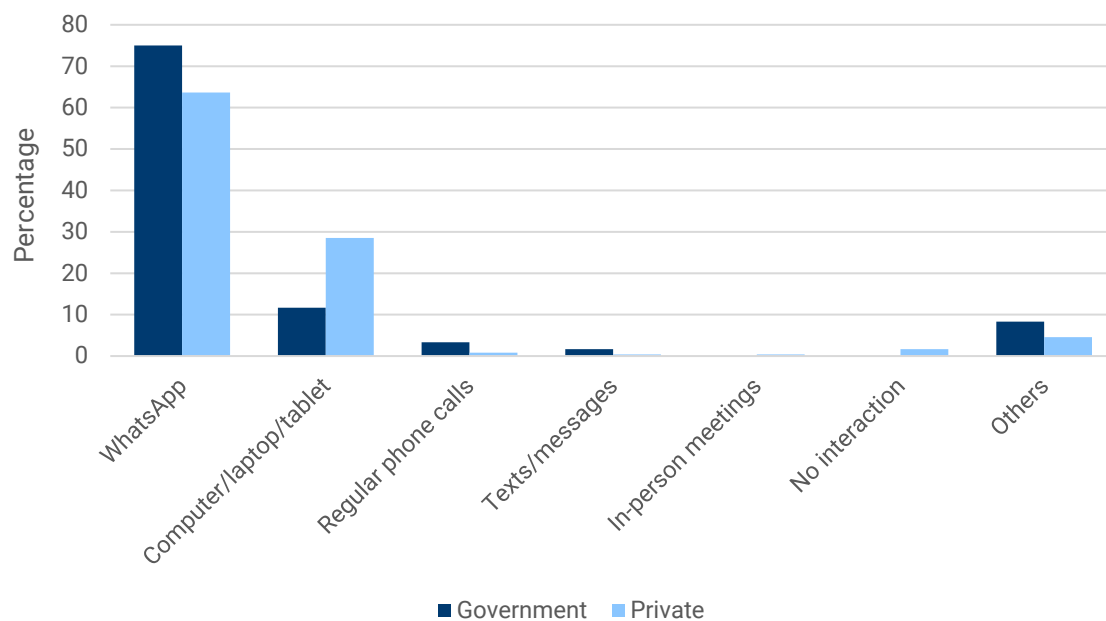
Source: February 2021 Brookings phone surveys.

Ed-tech use by schools during the COVID-19 school closures

Among the schools that introduced remote instruction, the two major sources of educational activities were WhatsApp (for text messages, voice calls, or video calls) and personal devices, such as computers, laptops, or tablets. While overall WhatsApp was used more than personal devices, the use of WhatsApp was higher among students in government schools and in low-SES households, and the use of personal devices was higher among students in private schools and high-SES households.

The data suggest differences in the main mode of remote instruction used by government and private schools. The share of parents of students in government schools reporting that the teachers used WhatsApp was higher than that of students in private schools (75% versus 64%). Conversely, the share of parents of students in private schools who reported that the teachers used personal devices to deliver instruction was higher than that of students in government schools (29% versus 12%); see Figure 20.

Figure 20: Modes of conducting educational activities during COVID-19, by type of school



Source: February 2021 Brookings phone surveys.

5. Discussion

In this study, we set out to explore the use of education technology in primary education in Chennai, Tamil Nadu during COVID-19. We investigated how ed-tech use differed by type of school, household SES, and gender of the student, and how it changed during the COVID-19 school closures. Ultimately, we wanted to know how the use of ed tech may exacerbate or mitigate the unequal impact of school closures on student learning in a low-income setting.

To this end, we collected data from a random sample of households with primary-school-aged children, and our final analytic sample included 270 children aged 4 to 11 years. The children in our sample were evenly distributed by household SES (about half came from low SES households and half from high SES households), and we had a slightly higher proportion of girls than boys (52% versus 48%), but the difference was not statistically significant.

A majority of children were enrolled in private schools, but the proportion of children by household SES varied. While enrollment by students from low SES households was

evenly distributed between government and private schools, students from high-SES households were much more likely to be enrolled in private schools. Our findings indicate that children from high SES households and those attending private schools experienced several advantages in access to learning opportunities, and the gap in learning opportunity increased during the COVID-19 school closures.

For example, as explained in the sections above, while prior to COVID-19 the use of ed tech was limited, private school students were more likely to have access to it at school. However, the use of ed tech at home (for example, to complete homework assignments) was minimal for both private and government school students. When schools closed in response to COVID-19, a majority of them started online instruction. Our data indicate that students in private schools and those in high-SES households were more engaged in regular educational activities than their peers in government schools and in low-SES households.

Compounding these differences in frequency of engagement in educational activities, the data also suggest differences in the quality of access to educational resources by household income. During the pandemic, children enrolled in private schools and from high-SES households had higher rates of access to digital devices—such as smartphones, internet, and computers/laptops—than their peers in government schools and from low-SES households. Indeed, television seems to be the main resource used for learning by children from low-SES households during the school closures. These preliminary results shed light into a likely growing inequality of educational opportunity by SES in Chennai and suggest the need for policymakers to support access to regular learning opportunities at home for children from low-SES households in government and private schools. Emerging evidence from the COVID-19 school closures suggests that ensuring students have access to even low-cost devices, such as smartphones, can help mitigate the potential learning losses (Angrist et al. 2020).

Ample research has shown that the impact of school closures in low-income countries may differ by gender, as girls are often expected to help out with household chores and/or assist parents in caring for younger siblings (Evans and Yuan 2019). Thus, it was encouraging to find that our data during the school closures show a different pattern—one where girls are more likely than boys to have access to digital devices for learning and to engage in more regular educational activities. Nevertheless, this finding suggests the need for further analysis into why boys may be losing out on educational opportunities, and what strategies may be most effective to increase learning among both girls and boys in India and other low-income countries.

Our results present a stark picture of primary-school-aged children’s educational opportunity during the pandemic in Tamil Nadu state: Too many children (20%) in our sample were enrolled in schools that did not offer any remote instruction during the

school closures. Among the children whose schools had begun remote instruction, only slightly more than half (57%) attended all the (remote) classes and close to 1 in 5 (19%) did not attend any (remote) classes. And, as mentioned, above, reported engagement in educational activities differed markedly between children in low- and high-income households, and between government- and private-school students.

Looking ahead, it will be crucial for the government of Tamil Nadu to enact a strategy to help students recover from the learning losses suffered during the school closures and to return to school. This strategy could include:

- (i) Working closely with the health authorities, plan to reopen schools safely as soon as possible. Following the guidelines from the central and state authorities, the Tamil Nadu education authority may plan to reopen schools safely as soon as possible. This report has shown the enormous impact of the school closures on learning opportunity across primary-school-aged children in Chennai, a reality that is not unique to the state of Tamil Nadu. The resulting learning losses, if unaddressed, could lead to huge economic losses to this generation of children, with the related losses in productivity and increases in poverty for the state of Tamil Nadu and India as a whole;
- (ii) Assess each child's foundational literacy and numeracy skills as soon as possible to help teachers and parents develop personalized interventions to ensure that each child can get back on track to develop these critical skills;
- (iii) Expand access to digital devices and connectivity among educators and students, along with guidance and support to teachers on ed-tech resources that are best aligned to each student's learning level. While ed tech is not alone going to ensure children learn, it can be a tool for educators, students, and parents to guarantee learning continuity during school closures and allow for more student-centered, engaging instruction in and outside the classroom.
- (iv) Provide socio-emotional support to educators and students, recognizing that the pandemic has not only caused learning loss but also emotional trauma in too many households.

To conclude, in order to address the learning losses resulting from the COVID-19 pandemic, a relentless focus on the *instructional core*, or the interactions between teachers, content, and students—in partnership with parents—will be even more necessary to ensure children the master foundational skills needed to progress in the education system and throughout life. Equally important—and especially given the traumatic impact of the pandemic in India—focusing on children's socio-emotional well-being will be key to ensure that this generation of children are not severely set back as a result of COVID-19.

6. References

- Alam, A. & Tiwari P. "Implications of COVID-19 for Low-cost Private Schools." *Unicef*, March 2021.
https://www.unicef.org/globalinsight/media/1581/file/UNICEF_Global_Insight_Implications_covid-19_Low-cost_Private_Schools_2021.pdf.
- Angrist, Noam, Peter Bergman, Caton Brewster, and Moitshepi Matsheng. (2020). "Stemming Learning Loss During the Pandemic: A Rapid Randomized Trial of a Low-Tech Intervention in Botswana." Available at SSRN: <https://ssrn.com/abstract=3663098> or <http://dx.doi.org/10.2139/ssrn.3663098>.
- Evans, D. K., & Yuan, F. (2019). What We Learn about Girls' Education from Interventions that Do Not Focus on Girls. Center for Global Development, Working Paper 513. Available at: <https://www.cgdev.org/publication/what-we-learn-about-girls-education-interventions-do-not-focus-on-girls>.
- Ganimian, Alejandro J, Emiliana Vegas, and Frederick M Hess. "Realizing the Promise: How Can Education Technology Can Improve Learning for All?" *Brookings Institution*, September 2020. <https://www.brookings.edu/essay/realizing-the-promise-how-can-education-technology-improve-learning-for-all/>.
- Ghanghar, G. "Parents shifting kids to govt schools due to financial problems amid Covid-19 lockdown." *India Today*, June 2021.
<https://www.indiatoday.in/education-today/news/story/parents-shifting-kids-to-govt-schools-due-to-financial-problems-amid-covid-19-lockdown-1819659-2021-06-26>.
- MHRD, Government of India. (1999). "Sarva shiksha abhiyan: framework for implementation." <https://www.educationforallinindia.com/SSA1.htm>.
- Morgan, C., A. Petrosino and T. Fronius. (2014). "Eliminating School Fees in Low Income Countries: A Systematic Review." *Journal of MultiDisciplinary Evaluation* 10(23): 26-43.
- Phadnis, A. "Story in Numbers: Students move from private to government schools." *Business Standard*, November 2020. https://www.business-standard.com/article/education/story-in-numbers-students-move-from-private-to-government-schools-120112900685_1.html.

Psacharopoulos, G., H.A. Patrinos, V. Collis, and E. Vegas. (2021). "[The COVID-19 Cost of School Closures in Earnings and Income across the World](#)." *Comparative Education Review* 65(2): 271-287.

"Rashtriya Madhyamik Shiksha Abhiyan (RMSA)." n.d. Government of India. <https://www.education.gov.in/hi/rmsa>.

Right to Education, n.d. <http://righttoeducation.in/know-your-rte/about>.

Samagra Shiksha, n.d. <https://samagra.education.gov.in/>.

UNICEF, 2021. "COVID-19: Schools for more than 168 million children globally have been completely closed for almost a full year, says UNICEF." <https://www.unicef.org/india/press-releases/covid-19-schools-more-168-million-children-globally-have-been-completely-closed>.

Vegas, Emiliana. "School closures, government responses, and learning inequality around the world during COVID-19." *The Brookings Institution*, April 2020. <https://www.brookings.edu/research/school-closures-government-responses-and-learning-inequality-around-the-world-during-covid-19/>.

Winthrop, Rebecca. "Can new forms of parent engagement be an education game changer post-COVID-19?" *The Brookings Institution*, October 2020. <https://www.brookings.edu/blog/education-plus-development/2020/10/21/can-new-forms-of-parent-engagement-be-an-education-game-changer-post-covid-19/>.