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Insights from a Catholic school's transition to distance learning during Covid-19

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ABSTRACT

Drawing upon 15 semi-structured interviews with teachers at a Catholic school in the British city of Hull, we offer new qualitative insights on the effects of students' unequal access to digital tools when switching to distance learning in the context of COVID-19 school closures. During the 2020–2021 academic year, this school serving pupils from highly dissimilar socioeconomic backgrounds distributed 300 laptops to students who did not own any digital learning device. It emerges that students with limited access to devices suffered negative impacts on their academic performance, and that this effect also applied to students who had access to a mobile device and hence did not receive a laptop. Our interviews also suggest that having to share a device with another family member leads to more absenteeism and a fall in academic attainment. Low parental involvement is shown to have negative effects on students' attainment, particularly for children from deprived backgrounds. Finally, poorer students are seen to become isolated from peers, with diminishing social skills throughout lockdowns due to their lack of access to digital tools.

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Introduction and context

How disruptive has the COVID-19 pandemic been for school students around the world? UNICEF (2021) estimates that at least 168 million children worldwide experienced complete school closures for almost an entire year due to COVID-19 lockdowns. The risk that these school closures may have widened the socioeconomic skills gap is considerable (Haeck & Lefebvre, 2020). Distance learning, which occurs when lessons are adapted to students and teachers being separated by place and/or time, did offer a solution yet the lack of access to digital tools for certain demographics proved to be a grave counterbalancing force (Moore et al., 2011). Indeed, UNICEF (2020) showed that 463 million students did not have the luxury of being able to learn remotely (Andrew et al., 2020b). Consequently, learning losses due to these school closures have been uneven across socioeconomic groups (Blaskó et al., 2021). There is also a fear that school closures may have triggered a long-term educational disengagement for students from lower income groups (Drane et al., 2020).

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In this direction, this article joins the body of work investigating the importance of digital equity in a context of crisis. Failing to ensure such equity may result in critical learning losses (Dhawan, 2020; Kuhfeld et al., 2020), cognitive losses (Murat & Bonacini, 2020), aspirations failure (Khattab, 2015), aspirations frustration (Boxer et al., 2010; Brunstein, 1993; DeBacker & Routon, 2021) and multiple other negative consequences. We find a lack of qualitative evidence on how the transition to distance learning during COVID-19 was experienced by students who lacked adequate digital tools, and contribute to filling this gap by conducting semi-structured interviews with 15 teachers at a Catholic school in the British city of Hull. Over the 2020–2021 academic year, as the switch to distance learning was taking place, this school issued 300 laptops to students who owned no digital device whatsoever, omitting pupils who had access to a mobile device due to a limited number of laptops. Our interviews offer a range of insights which we believe should be taken into consideration when an institution opts to switch to distance learning. In particular, our interviewees touched upon 1) the importance of device compatibility, 2) the role of parents' involvement, and 3) the existence of a group of ultra-vulnerable students.

Literature review

The provision of digital tools

The term 'digital tool' refers to both the hard device (e.g. laptops, tablets or mobile phones) and the software via which student-teacher interactions actually take place (e.g. Microsoft Teams, Adobe products, Moodle, etc.). The COVID-19 pandemic has led to a mass provision of such digital tools to students to support the shift to distance learning. The goal was to help disadvantaged students who are most vulnerable to this transition, although there is substantial literature which suggests that providing digital tools alone is not enough to solve socio-digital inequalities. Hall et al. (2020) list a number of challenges to consider, such as an absence of internet connection at home or not knowing how to utilise a particular technology. Using interviews, Frohn (2021) finds that simply owning a digital device is not enough for effective distance learning, and that students and teachers must both be equipped with suitable digital skills to use these devices. Similarly, Kulikowski et al. (2021) posit that teachers must receive immediate training on the necessary software needed for distance learning.

A large strand of literature documents negative impacts of a provision of digital tools to students. Using data from the United States, Vigdor et al. (2014) show that the introduction of high-speed internet has had negative effects on mathematics and reading exam results. The availability of high-speed internet was seen to lower computer use for homework, with students opting for recreational activities rather than educational ones. Vigdor et al. (2014) also suggest that providing universal access to home computers and high-speed internet may widen racial and socioeconomic achievement gaps, as some groups are able to use technology more productively than others. In Uruguay, a one-laptop-per child program successfully eliminated the technological gap between private and public-school students, but the provision of laptops had little impact on other outcomes of interest such as educational attainment or the schooling gap (Yanguas, 2020). Surveying schools in Sweden, Hall et al. (2021) find that school provision of laptops

or tablets can increase inequality in educational outcomes by reducing the performance of low-socioeconomic status students. Beuermann et al. (2015) implemented a randomised control trial, distributing a thousand laptops to primary school students in Lima, Peru. Students who received a laptop emerge as exerting significantly less academic effort compared to their peers who did not receive a laptop.

Challenges to distance learning

The risk of distraction

A key challenge to distance learning is the increased probability of students getting distracted compared to face-to-face classes. In fact, even in a face-to-face context, digital tools have been found to act as a distracting factor leading to lower academic outcomes (Dontre, 2020). For instance, Carter's et al. (2017) randomised trial in the United States Military Academy shows that permitting computer devices in classrooms has a negative effect on exam scores.

In-person learning seems to be more beneficial for academic attainment compared to online learning. Bettinger et al. (2017) studied university students and found that taking an online course, instead of in-person course, decreases students' grades and likelihood to remain enrolled at university. Using data from Switzerland, Tomasik et al. (2020) find that primary school students learned more than twice as fast during in-person learning compared to distance learning. However, Vittorini and Galassi (2021) find that online learning has a positive effect on higher student engagement.

Cell phones have been shown to have positive effects on student engagement and motivation but can also be a source of distraction (Shelton et al., 2009; Thomas et al., 2013). Beland and Murphy (2016) surveyed schools in England and found that mobile phone bans in schools led to a significant increase in exam grades, and that this effect was driven by the lowest-achieving students. Their findings suggest underachieving students are more easily distracted by the presence of mobile phones in school.

The case of absenteeism

Aside from the possibility of distraction, the risk of complete and unnoticed absenteeism in distance learning must be considered. With the possibility of turning cameras off as well as muting videos, many teachers find themselves wondering whether students are really present. Gershenson et al. (2016) shows that school absenteeism has negative effects on academic achievement, particularly for low-income students. Gottfried and Kirksey (2017) suggest that school absenteeism may have a greater negative effect on low-income students' exam results as they are unlikely to have the resources to make up for the lost instructional time at home. Tomasik et al. (2020) documents that having minority status and coming from a low-income family both correlate with school absenteeism.

The problem of absenteeism lies in the loss of instructional time, which also applies in the case of class cancellation or teacher absence. Belot and Webbink (2010) show that school disruptions caused by teacher strikes in Belgium result in lower educational achievement, increased grade repetition and less students going into higher education. In Ontario, Johnson (2011) shows that teacher strikes are associated with significant

reductions in students' academic performance in disadvantaged schools, highlighting that the quantity of instructional time is critical; in fact, the loss of instructional days due to teacher strikes clearly engenders a learning gap between affected and unaffected schools.

The role of parents

Not all parents get involved in their children's education, be it in periods of stability or during times of crisis. A number of factors are found to determine parental involvement, socioeconomic status being a key determinant (Azubuike et al., 2021; Lareau, 1987). Smith (2006) documents that children from low-income families tend to have less parental involvement, thus benefiting less from the academic and attitudinal benefits of parental involvement compared to children from richer households. In the current context of COVID-19, Dietrich et al. (2021) find significant variation in home schooling efforts among German households during the school closures, with variations taking place along socioeconomic lines.

Parental involvement positively impacts a pupil's academic performance (Boonk et al., 2018; Holloway et al., 2016; Lareau, 1987). The differences in parental involvement between different income groups further support the thesis that COVID-19 school closures could have an amplifying effect on socioeconomic polarisation. In the Netherlands, Bol (2020) finds that students from wealthier households had greater parental support and more resources that supported distance learning during the COVID-19 pandemic. Using internet search data, Bacher-Hicks et al. (2021) show that search intensity for online learning resources increased nationwide as US households sought to compensate for the COVID-19 school closures. Within the United States, areas that have higher income, better internet accessibility and lower numbers of rural schools experienced greater increases in search intensity for online learning resources (Bacher-Hicks et al., 2021). During that same pandemic, Jæger and Blaabæk (2020) show that wealthier Danish families had a higher takeout of digital children's books from public libraries compared to worse-off families during COVID-19, thus creating inequities in learning opportunities.

Educational inequality during COVID-19

There is a growing body of literature which suggests that COVID-19 school closures disproportionately harmed students from lower socioeconomic backgrounds (Blanden & Gregg, 2004). In the UK, Aristeidou and Cross (2021) survey undergraduates and find that students from a lower socioeconomic group had a 16 times higher probability of experiencing negative impacts on their assessment outcomes due to the pandemic than students of a higher group. In the US, Aucejo et al. (2020) survey students and find that low-income students have a 55% increased likelihood of a delayed graduation due to COVID-19 compared to their high-income peers. In Denmark, Reimer et al. (2021) show that COVID-19 school closures widened inequality in students' reading behaviour, with a clear socioeconomic gradient in students' reading behaviour. In Germany, Werner and Woessmann (2021) find significant reductions in achievement test scores, particularly for financially disadvantaged students.

Additionally, COVID-19 school closures have had uneven effects on students from families with different educational backgrounds. Learning losses due to school closures are up to 60% higher for students with less-educated parents (Engzell et al., 2021). While students at all learning levels have a significant risk of learning loss due to school closures, high achieving students with higher educated parents have a lower risk of experiencing learning losses (Arsendy et al., 2020). Contini et al. (2021) find that among Italian children with less educated parents, the best performing students suffered the largest learning losses from COVID-19 school closures, perhaps because they were the greatest gainers from attending school.

Students' learning time substantially fell during school closures, especially for low-achieving students (Werner & Woessmann, 2021). These learning losses may lead to lower lifetime income for students affected by the closures, and these economic losses will probably be greater for disadvantaged students (Hanushek & Woessmann, 2020). Maldonado and De Witte (2021) investigated the effects of the COVID-19 school closures on Belgian schools and suggest that establishments with a larger share of disadvantaged students suffer larger learning losses compared to schools with a lower share of pupils from these income groups.

Poor learning environments at home are found to significantly decrease educational activity during home-schooling, thus engendering clear learning loss (Dietrich et al., 2021). Children from low-income households face more challenges to distance learning as they lack adequate resources, such as suitable workspace, reliable internet and digital devices (Lancker & Parolin, 2020). Darmody et al. (2021) document that students from high-income households are more likely to have parents working from home during COVID-19 restrictions, in addition to having greater access to high-speed broadband and other resources which help with distance learning. Huang and Russell (2006) surveyed principals, teachers, and parents of fifth graders in Oklahoma and found that greater access to technology is positively correlated with mathematics, science and reading scores, and that socioeconomic factors influence the technology accessibility of students. Also in the US, Becker (2000) finds that children from high-income households had significantly greater access to home computers compared to children from lower income groups. Among children with access, computer use was lower in children from low-income households, possibly due to issues with internet connectivity.

Differences exist not only in terms of resources available at home, but also in resources provided by schools. In the UK, Bayrakdar and Guveli (2020) find that half of the learning gap between pupils on free school meals and those who are not can be explained by schools' different provisions of distance learning. Andrew et al., 2020a find that students from higher-income families attend schools that are more likely to offer active resources such as online classes, video and text chatting.

Methodology

This study involved interviewing 15 teachers from a Catholic school located in the British city of Hull over the month of August 2021. All of the participants worked full time. Twelve of the interviewees were subject specialists and class-based teachers. One of the 15 participants worked in the pastoral care team. The remaining two held both teaching duties and senior administrative roles within the establishment. Prior to COVID-19 neither

the teachers nor the students had any experience with distance learning. However, it must be noted that the school had received a grant to improve technology within the school before the pandemic, and that this grant was also used to teach students basic ICT skills. Teachers in the selected school all had first-hand experience with students who are classified as 'deprived'.

The choice of the city of Hull was made because of the city's high level of deprivation. Hull ranks 6th worse for income deprivation as well as 7th worse for employment deprivation among cities in England (Ministry of Housing, Communities and Local Government, 2019). The selected school operates at a pupil premium of 19.9%; this is the measurement for students who have claimed a free school meal over the last 6 years and is widely accepted as a proxy for the percentage of students experiencing deprivation. More interestingly, the catchment area of the selected school includes both deprived and affluent neighbourhoods. For instance, according to the Index of Multi Deprivation (the UK government's official measure of relative deprivation), parts of the neighbouring town of Beverley rank 30,211 out of 32,844, where 1 is the most deprived (UK Local Area, 2021a). This may be compared to Orchard Park, another catchment for the selected school which ranks 281 (UK Local Area, 2021b). This stark contrast means teachers were able to observe the differing effects that the school's closure had on students from different socioeconomic backgrounds.

Face-to-face, semi-structured interviews were held, and the same questions were asked to each participant. Opting for an interpretivist approach, the interviewer encouraged elaboration and detail on areas of importance thus, producing individualised responses. Three interviews were selected as the pilot study. We followed Malmqvist et al. (2019) and included the pilot study in our findings and analysis. Owing to the semi-structured interview approach, follow-up questions were possible, bringing further richness to the study. Following the ethical considerations highlighted by Gibbs et al. (2007), the follow-up questions were not used to collect data deemed unnecessary to the research. Interviews were recorded and transcribed using Microsoft Teams, after which manual thematic analysis was applied.

Ethical issues such as confidentiality and informed consent were addressed by ensuring anonymity of the participants and gaining permission from participants to take part in the interviewing process. Issues such as leading questions and inconsistency in questioning have been limited through the use of an interview guide.

However, we must note that the school where this research was conducted is a Catholic school, which may be considered a limitation due to the greater levels of disadvantaged pupils in such establishments as well as an above average performance level (Morris, 2005). According to the UK government's Secondary Accountability Measures for schools, this particular school has a 'progress 8' score of 0.77, meaning that an average pupil progressed by 0.77 grades from the start of year 7 to the end of year 11, compared to the national average of 0.4 (UK Department for Education, 2022). Yet, we believe that this limitation does not constitute a worrying bias considering the nature of our research question and the topic at hand.

Findings and discussion

Access to digital tools

All participants mentioned issues arising from the initial lack of digital access that some students experienced. Participant 5 explained that surveys were sent out to see what devices the students possessed. Participant 1 believed that typically the most deprived students were unable to access sufficient devices from the very start of the shift to distance learning. Participant 3 said the students who were most affected by the school closures were the 'students that struggled with computer access at the start'. Participant 6 stated that the students who were identified as having no access to digital devices were eventually provided with a school laptop. However, students who requested a laptop were not provided with a school laptop immediately and often experienced a delay.

The lack of devices led to the provision of free laptops from the school, which were distributed to the students most in need. Participant 1 stated 'the school issued 250–300 laptops over the pandemic'. Participant 1 revealed that students who had access to a mobile device were not prioritised and did not always receive a school laptop. Participant 3 commented on the compatibility of devices with regards to subject specific software; for instance, mobile phones could not use Adobe products for art and design subjects. Participant 4 said the inconsistency in devices became a challenge for teachers as they struggled to understand what software was compatible for each device. Students also suffered from the inconsistency in devices. Participant 10 stated 'using [Microsoft] Teams on your phone is a lot harder than it is on a tablet or laptop' and Participant 12 said 'the ones who were doing it on phones, struggled more'.

In this direction, Participant 1 witnessed that the students who suffered from inadequate access to digital tools had a 'dip in attainment'. Similar consequences were highlighted by teachers who had students who were sharing devices with other household members. Participant 5 gave the example of a student who was sharing a laptop with his mother and stated that sharing a device 'was very hit and miss as to whether they were ever there'. Participant 5 elaborated that this impacted grade attainment; referring to a particular student who shared a laptop with siblings, they stated that 'it is fair to say that the grade that he will be getting this week is lower than what he would have obtained if the pandemic hadn't have happened'. Several participants noticed that students who were sharing devices with other household members had lower attendance at live lessons. Participant 14 witnessed that 'students who were sharing devices did suffer [. . .] it certainly had an impact on their attainment'.

These findings are in line with other works such as Pensiero et al. (2021) which state that children who lack digital tools typically suffer more from the shift to distance learning. Our interviews reveal that students who lacked adequate digital tools at the start of school closures were provided with laptops by the school. Students who did not own any devices were prioritised, and those who had access to mobile phones were often required to use them for online learning. Students whose only digital access was though a mobile phone struggled more with online learning. This is in parallel with Milheim et al. (2021), who surveyed college students enrolled in online courses and found that using a mobile device to complete tasks often takes longer compared to using a laptop or PC. Thus, students who had access to a variety of devices were at an advantage compared to

students who only possessed a mobile phone. Perhaps more interestingly, our findings show that the shift to distance learning not only affected students with no access to digital devices, but also had unfair consequences for students with access to a mobile device. It could be argued that students with no initial access eventually became better equipped during school closures compared to students who possessed a mobile device, due to the provision of free laptops by the school.

The interviews reveal that many students shared a digital device with another household member during the distance learning period. Students who shared a device had issues with their attendance in live lessons and experienced lower grade attainment. This fall in attained grades could potentially have detrimental long-term consequences for students as school grades are taken into account for higher education and potentially for job applications. Despite all students having a significant risk of learning loss due to COVID-19 school closures (Arsendy et al., 2020), our findings suggest that a child who has to share a device with another household member suffers most. In the long-term, this could potentially fuel polarisation whereby students from lower socioeconomic backgrounds have less opportunities to advance to higher education. This is supported by Blanden, Machin, 2004 who show that the expansion in higher education in the UK from the 1960s to the early 2000's has been unequally distributed between high-income and low-income groups, with children from wealthier backgrounds being the main winners.

Parental involvement

The importance of parental involvement in distance learning was expressed by many participants. Participant 6 found that students struggled with distance learning if there was no help from a parent. Participant 5 identified that children who were well supported by parents coped better with the shift to distance learning. Participant 15 agreed and stated that 'students with a more supportive background [. . .] just submitted more work'. Participant 3 suggested that lack of parental input and support had a 'detrimental impact' on a child's education.

When identifying the demographic of students with less parental involvement, Participant 1 observed that parents who 'have not been through academia, don't know what it is like to succeed academically, and it's significantly harder to get them engaged in their son's and daughter's learning'. Moreover, Participant 1 revealed that prior to COVID-19 closures, teachers would often find it challenging to promote parental engagement with students from deprived backgrounds. Participant 14 discussed the occupation of parents with low engagement in their child's education, stating that 'parents who are perhaps factory or shift workers often weren't around during the day. The students were left to their own devices'.

Parental involvement had a direct impact on students' distance learning experience during the COVID-19 school closures. Our findings show that greater parental involvement was associated with a higher work submission rate. Other studies have shown that low parental involvement is more prevalent in lower socioeconomic families (Azubuike et al., 2021; Lareau, 1987), with mothers from higher socioeconomic backgrounds displaying higher levels of parental involvement (Holloway et al., 2016). The shift to online schooling worsened socioeconomic inequalities as a result of the differences in the volume of schoolwork completed and the level of parental involvement in children's

education (Pensiero et al., 2021). This is reflected in our findings, with the interviewed teachers clearly expressing a difficulty in promoting parental engagement within deprived families.

Parental involvement has become increasingly important in the context of lockdowns as parents have to replicate the supervision that is normally carried out by teachers. Attending school has homogenising effects, as students within a school are provided with the same learning experience. COVID-19 school closures have made learning more reliant on families and digital tools rather than teachers, thus amplifying social class achievement gaps (Goudeau et al., 2021). The teacher interviews reveal parents who are factory or shift workers were unable to support their child's distance learning and would leave their children to their own devices.

Learning gap

Participants 2, 5, 9, and 13 spoke about the changes to curriculum that had to be implemented in light of the closure and the challenges that accompanied it. This was more prevalent in practical GCSE and A-Level subjects such as music, PE and performing arts. Participant 5 said 'students haven't been able to engage with the subject in the way that they would normally' and that 'progress has been worse'. Learning gaps emerged with students who had no access to the practical side of subjects, such as having a musical instrument at home. According to Participant 3, the lack of access to devices caused a skills' deficit and resulted in students 'missing lessons' which further amplified learning losses.

The learning gap for younger students was mentioned by Participant 1, who said that 'our year 7's in this academic year were in year 6 (during school closures) so they missed the end of their primary school [. . .] they missed the transition into our secondary school'. The implications of this are evidenced by Participant 1 who stated, 'year 7's [. . .] were spending inordinate amounts of time doing the work that had been set'. By contrast, older year groups did not receive such feedback. Participant 2 observed ability gaps had widened in the new academic year. The most predominant gaps identified by Participant 2 were 'knowledge and coverage of curriculum'.

Lack of resources for distance learning can exacerbate the learning loss induced by the pandemic (Blaskó et al., 2021). The emerging learning gaps during online learning led to teachers having to change curricula due to students' inability to access certain learning aids as well as device compatibility issues. Incompatibility of certain devices meant subject specific software was inaccessible and teachers revealed that the most deprived students were the ones who typically missed out. Mobile phones were found to have the most compatibility issues, which is in line with Milheim et al. (2021).

Many younger students struggled to grasp concepts that should have been taught in the previous year (i.e. during school closures) and had difficulties transitioning into secondary school. For instance, year 7 students, who missed out on the majority of face-to-face teaching in year 6, were found to be spending too much time on homework. This may be a result of the learning gap created through the school closures in their final year of primary school.

Consequences on social and mental well-being

Several participants discussed the effects of distance learning on students' social and mental well-being. Participant 2 stated that there had been 'social and emotional deficits [. . .] particularly for disadvantaged pupils'. Participant 15 discussed the difficulties for students who live in 'a chaotic household and enjoy school because they have a routine, and the structure was difficult to replace' with distance learning. Participant 7, who is involved in teaching children with learning difficulties, explained that the school had to reduce their number of online school hours in order to keep them 'more engaged'. The reduction in online school hours also aimed to improve students' mental well-being and reduce stress.

Potential social implications of online schooling were also considered. Participant 7 highlighted that for some students, group lessons were 'the only time they got to speak to their friends because they didn't have phones'. Participant 14 witnessed 'gaps in social skills' for students who had no access to devices such as mobile phones. Participant 8 stated that students had 'social vulnerabilities and maybe confidence in social skills' with gaps appearing in 'social aspects of their lives' due to the lockdowns. Participant 7 agreed that social skills were lost with the shift to distance learning.

Parents' unfamiliarity with ICT use and overcrowded housing are some of the challenges faced by children when learning online, and children from low socioeconomic backgrounds are disproportionately affected by this (Dimopoulos et al., 2021). The teacher interviews reveal that school provides a sense of routine for students who live in chaotic households. Chaotic homes had negative implications for deprived students' emotional and mental well-being during the school closures (Lundie & Law, 2020). Increased stress and health problems during the COVID-19 school closures were more prominent in lower socioeconomic status households (Doyle, 2020). In order to improve students' mental well-being and reduce stress, the school reduced teaching time for certain lessons. However, literature shows that lost instructional time reduces students' academic attainment (Baker, 2013; Belot & Webbink, 2010; Johnson, 2011; Meyers & Thomasson, 2017). Thus, reductions in teaching time may unintentionally create learning losses and inflict further stress due to a fall in academic performance.

Children from privileged backgrounds found it easier to keep in contact with each other due to their access to digital devices. This indicates that a lack of devices not only impacts a student's ability to learn, but also their social sphere. Johnson (2008) shows that simple daily interaction between students and teachers increases children's resilience in dealing with difficulties. The lack of contact with students and teachers during school closures may have lowered children's resilience, which could have detrimental long term consequences.

Conclusion

This paper contributes qualitative evidence to the literature on inequality and distance learning in the context of the COVID-19 school closures. Our findings suggest that the transition to distance learning during COVID-19 negatively impacted the academic performance of students who did not have access to adequate digital tools. This effect was not unique to students who had no devices; students who had access to a mobile device

also emerge as having compromised learning. Furthermore, students who had to share a device with another household member exhibited less attendance at online lessons and experienced a clear fall in academic attainment.

Our study shows that the difficulty of access to digital devices is not the sole culprit for students' heterogeneous learning experiences during the COVID-19 school closures. Indeed, our findings highlight the importance of parental involvement in their children's education, with low parental involvement shown to have negative effects on students' educational attainment. Our interviewees stated that most of the children who experienced low levels of parental involvement were from deprived backgrounds, which further supports the hypothesis that socioeconomic disparities have led to unequal consequences of school closures. Our interviews also touched upon the personal consequences of the shift to distance learning, focusing on both mental and social aspects. Students without devices were shown to be more isolated from their friends, with diminishing social skills throughout lockdowns. We consider this to be another factor amplifying the learning gap between deprived and privileged students.

We believe that the most important theme to emerge out of our interviews is the problem of device compatibility. Indeed, students with access to mobile phones, thus who were not eligible to receive school laptops, were negatively impacted by the shift to distance learning due to device compatibility issues. The provision of laptops was below optimum and left many children with inadequate resources to engage in distance learning. Further research into this direction is recommended to enable the design and implementation of more effective provision policies based on accurate measurements of the digital deficit among school students.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., & Sevilla, A. (2020a). *Learning during the lockdown: Real-time data on children's experiences during home learning (briefing Note no. BN288)*. Institute for Fiscal Studies (IFS).

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., & Sevilla, A. (2020b). Inequalities in children's experiences of home learning during the COVID-

19 lockdown in England. *Fiscal studies*, *41*(3), 653–683. https://doi.org/10.1111/1475-5890.12240

Aristeidou, M., & Cross, S. (2021). Disrupted distance learning: The impact of Covid-19 on study habits of distance learning university students. *Open Learning: The Journal of Open, Distance and E-Learning*, *36*(3), 263–282. https://doi.org/10.1080/02680513.2021.1973400

Arsendy, S., Gunawan, C. J., Rarasati, N., & Suryadarma, D. (2020). Teaching and learning during school closure: Lessons from Indonesia. *ISEAS Yusof Ishak Institute*, *2020*(89), 1–11.

Aucejo, E. M., French, J. F., Araya, M. P. U., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. *Journal of Public Economics*, *191*, 104271. https://doi.org/10.1016/j.jpubeco.2020.104271

Azubuike, O. B., Adegboye, O., & Quadri, H. (2021). Who gets to learn in a pandemic? Exploring the digital divide in remote learning during the COVID-19 pandemic in Nigeria. *International Journal of Educational Research Open*, *2*(2), 100022. . https://doi.org/10.1016/j.ijedro.2020.100022

Bacher-Hicks, A., Goodman, J., & Mulhern, C. (2021). Inequality in household adaptation to schooling shocks: Covid-induced online learning engagement in real time. *Journal of Public Economics*, *193*, 104345. https://doi.org/10.1016/j.jpubeco.2020.104345

Baker, M. (2013). Industrial actions in schools: Strikes and student achievement. *The Canadian Journal of Economics*, *46*(3), 1014–1036. https://doi.org/10.1111/caje.12035

Bayrakdar, S., & Guveli, A. (2020). *Inequalities in home learning and schools' provision of distance teaching during school closure of COVID-19 lockdown in the UK* (ISER Working Paper Series, No. 2020-09). University of Essex, Institute for Social and Economic Research (ISER), Colchester.

Becker, H. J. (2000). Who's wired and who's not: Children's access to and use of computer technology. *The Future of Children*, *10*(2), 44–75. https://doi.org/10.2307/1602689

Beland, L. P., & Murphy, R. (2016). Ill Communication: Technology, distraction & student performance. *Labour Economics*, *41*(C), 61–76. https://doi.org/10.1016/j.labeco.2016.04.004

Belot, M., & Webbink, D. (2010). Do teacher strikes harm educational attainment of students? *LABOUR*, *24*(4), 391–406. https://doi.org/10.1111/j.1467-9914.2010.00494.x

Bettinger, E. P., Fox, L., Loeb, S., & Taylor, E. S. (2017). Virtual classrooms: How online college courses affect student success. *The American Economic Review*, *107*(9), 2855–2875. https://doi.org/10.1257/aer.20151193

Beuermann, D. W., Cristia, J., Cueto, S., Malamud, O., & Cruz-Aguayo, Y. (2015). One laptop per child at home: Short-term impacts from a randomized experiment in Peru. *American Economic Journal: Applied Economics*, *7*(2), 53–80. https://doi.org/10.1257/app.20130267

Blanden, J., & Gregg, P. (2004). Family income and educational attainment: A review of approaches and evidence for Britain. *Oxford Review of Economic Policy*, *20*(2), 245–263. https://doi.org/10.1093/oxrep/grh014

Blanden, J., & Machin, S. (2004). Educational inequality and the expansion of UK higher education. *Scottish Journal of Political Economy*, *51*(2), 230–249. https://doi.org/10.1111/j.0036-9292.2004.00304.x

Blaskó, Z., da Costa, P., & Schnepf, S. V. (2021). *Learning loss and educational inequalities in Europe: Mapping the potential consequences of the COVID-19 crisis* (Discussion Paper 14298). IZA Institute of Labour Economics.

Bol, T. (2020). *Inequality in homeschooling during the Corona crisis in the Netherlands. First results from the LISS Panel* (Working Paper). SocArXiv, April 30, 2020. https://doi.org/10.31235/osf.io/hf32q

Boonk, L., Gijselaers, H. J. M., Ritzen, H., & Brand-Gruwel, S. (2018). A review of the relationship between parental involvement indicators and academic achievement. *Educational Research Review*, *24*, 10–30. https://doi.org/10.1016/j.edurev.2018.02.001

Boxer, P., Goldstein, S., DeLorenzo, T., Savoy, S., & Mercado, I. (2010). Educational aspiration-expectation discrepancies: Relation to socioeconomic and academic risk-related factors. *Journal of Adolescence*, *34*(4), 609–617. https://doi.org/10.1016/j.adolescence.2010.10.002

Brunstein, J. C. (1993). Personal goals and subjective well-being: A longitudinal study. *Journal of Personality and Social Psychology*, *65*(5), 1061–1070. https://doi.org/10.1037/0022-3514.65.5.1061

Carter, S. P., Greenberg, K., & Walker, M. S. (2017). The impact of computer usage on academic performance: Evidence from a randomized trial at the United States Military Academy. *Economics of Education Review*, *56*(C), 118–132. https://doi.org/10.1016/j.econedurev.2016.12.005

Contini, D., DiTommaso, M. L., Muratori, C., Piazzalunga, D., & Schiavon, L. (2021). *The COVID-19 pandemic and school closure: Learning loss in mathematics in primary education* (Discussion Paper 14785). IZA Institute of Labour Economics.

Darmody, M., Smyth, E., & Russell, H. (2021). Impacts of the COVID-19 control measures on widening educational inequalities. *YOUNG*, *29*(4), 366–380. https://doi.org/10.1177/11033088211027412

DeBacker, J., & Routon, P. M. (2021). A culture of despair? Inequality and expectations of educational success. *Contemporary Economic Policy*, *39*(3), 573–588. https://doi.org/10.1111/coep.12528

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Dietrich, H., Patzina, A., & Lerche, A. (2021). Social inequality in the homeschooling efforts of German high school students during a school closing period. *European Societies*, *23*(S1), S348–369. https://doi.org/10.1080/14616696.2020.1826556

Dimopoulos, K., Koutsampelas, C., & Tsatsaroni, A. (2021). Home schooling through online teaching in the era of COVID-19: Exploring the role of home-related factors that deepen educational inequalities across European societies. *European Educational Research Journal*, *20*(4), 479–497. https://doi.org/10.1177/14749041211023331

Dontre, A. J. (2020). The influence of technology on academic distraction: A review. *Human Behavior and Emerging Technologies*, *3*(3), 379–390. https://doi.org/10.1002/hbe2.229

Doyle, O. (2020). *COVID-19: Exacerbating educational inequalities?* (Working Paper). UCD Geary Institute for Public Policy. https://publicpolicy.ie/papers/covid-19-exacerbating-educational-inequalities/

Drane, C., Vernon, L., & O'Shea, S. (2020). *The impact of 'learning at home' on the educational outcomes of vulnerable children in Australia during the COVID-19 pandemic (Literature Review)*. National Centre for Student Equity in Higher Education, Curtin University.

Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *PNAS*, *118*(17), e2022376118. https://doi.org/10.1073/pnas.2022376118

Frohn, J. (2021). Troubled schools in troubled times: How COVID-19 affects educational inequalities and what measures can be taken. *European Educational Research Journal*, *20*(5), 667–683. https://doi.org/10.1177/14749041211020974

Gershenson, S., Jacknowitz, A., & Brannegan, A. (2016). Are student absences worth the worry in U.S. primary schools? *Education Finance and Policy*, *12*(1), 1–47. https://doi.org/10.2139/ssrn.2708371

Gibbs, L., Kealy, M., Willis, K., Green, J., Welch, N., & Daly, J. (2007). What have sampling and data collection got to do with good qualitative research? *Australian and New Zealand Journal of Public Health*, *31*(6), 540–544. https://doi.org/10.1111/j.1753-6405.2007.00140.x

Gottfried, M. A., & Kirksey, J. J. (2017). "When" students miss school: The role of timing of absenteeism on students' test performance. *Educational Researcher*, *46*(3), 119–130. https://doi.org/10.3102/0013189X17703945

Goudeau, S., Sanrey, C., Stanczak, A., Manstead, A., & Darnon, C. (2021). Why lockdown and distance learning during the COVID-19 pandemic are likely to increase the social class achievement gap. *Nature Human Behaviour*, *5*, 1273–1281. https://doi.org/10.1038/s41562-021-01212-7

Haeck, C., & Lefebvre, P. (2020). Pandemic school closures may increase inequality in test scores. *Canadian Public Policy*, *46*(S1), S82–87. https://doi.org/10.3138/cpp.2020-055

Hall, C., Lundin, M., & Sibbmark, K. (2021). A laptop for every child? The impact of technology on human capital formation. *Labour Economics*, *69*, 101957. https://doi.org/10.1016/j.labeco.2020.101957

Hall, J., Roman, C., Jovel-Arias, C., & Young, C. (2020). Pre-service teachers examine digital equity amidst schools' COVID-19 responses. *Journal of Technology and Teacher Education*, *28*(2), 435–442.

Hanushek, E. A., & Woessmann, L. (2020). *The economic impacts of learning losses* (Education Working Paper, No. 225). OECD.

Holloway, S. D., Campbell, E. J., Nagase, A., Kim, S., Suzuki, S., Wang, Q., Iwatate, K., & Baak, S. Y. (2016). Parenting self-efficacy and parental involvement: Mediators or moderators between socioeconomic status and children's academic competence in Japan and Korea? *Research in Human Development*, *13*(3), 258–272. https://doi.org/10.1080/15427609.2016.1194710

Huang, J., & Russell, S. (2006). The digital divide and academic achievement. *Electronic Library*, *24*(2), 160–173. https://doi.org/10.1108/02640470610660350

Jæger, M. M., & Blaabæk, E. H. (2020). Inequality in learning opportunities during Covid-19: Evidence from library takeout. *Research in Social Stratification and Mobility*, *68*, 100524. https://doi.org/10.1016/j.rssm.2020.100524

Johnson, B. (2008). Teacher-student relationships which promote resilience at school: A micro-level analysis of students' views. *British Journal of Guidance & Counselling*, *36*(4), 385–398. https://doi.org/10.1080/03069880802364528

Johnson, D. R. (2011). Do strikes and work-to-rule campaigns change elementary school assessment results? *Canadian Public Policy*, *37*(4), 479–494. https://doi.org/10.3138/cpp.37.4.479

Khattab, N. (2015). Students' aspirations, expectations and school achievement: What really matters? *British Educational Research Journal*, *41*(5), 731–748. https://doi.org/10.1002/berj.3171

Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educational Researcher*, *49*(8), 549–565. https://doi.org/10.3102/0013189X20965918

Kulikowski, K., Przytula, S., & Sulkowski, L. (2021). Emergency forced pandemic e-learning – feedback from students for HEI management. *Open Learning: The Journal of Open, Distance and E-Learning*, *36*(3), 245–262. https://doi.org/10.1080/02680513.2021.1942810

Lancker, W. V., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: A social crisis in the making. *The Lancet*, *5*(5), e243–244. https://doi.org/10.1016/S2468-2667(20)30084-0

Lareau, A. (1987). Social class differences in family-school relationships: The importance of cultural capital. *Sociology of Education*, *60*(2), 73–85. https://doi.org/10.2307/2112583

Lundie, D., & Law, J. (2020). *Teachers' responses and expectations in the COVID-19 school shutdown period in the UK* (Technical Report). Scottish Parliament.

Maldonado, J. E., & De Witte, K. (2021). The effect of school closures on standardised student test outcomes. *British Educational Research Journal*, *48*(1), 49–94. https://doi.org/10.1002/berj.3754

Malmqvist, J., Hellberg, K., Möllås, G., Rose, R., & Shevlin, M. (2019). Conducting the pilot study: A neglected part of the research process? Methodological findings supporting the importance of piloting in qualitative research studies. *International Journal of Qualitative Methods*, *18*, 160940691987834. https://doi.org/10.1177/1609406919878341

Meyers, K., & Thomasson, M. A. (2017). *Paralyzed by panic: Measuring the effect of school closures during the 1916 polio pandemic on educational attainment* (NBER Working Paper No. 23890). National Bureau of Economic Research Inc.

Milheim, K., Fraenza, C., & Palermo-Kielb, K. (2021). Supporting student-initiated mobile device use in online learning. *Online Learning*, *25*(3), 267–288. https://doi.org/10.24059/olj.v25i3.2438

Ministry of Housing, Communities and Local Government. (2019). *The English Indices of Deprivation 2019*. (IoD2019). https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

Moore, J. L., Dickson Deane, C., & Galyen, K. (2011). E-learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education*, *14*(2), 129–135. https://doi.org/10.1016/j.iheduc.2010.10.001

Morris, A. B. (2005). Diversity, deprivation and the common good: Pupil attainment in Catholic schools in England. *Oxford*. *Review of Education*, *31*(2), 311–330. https://doi.org/10.1080/03054980500117959

Murat, M., & Bonacini, L. (2020). *Coronavirus pandemic, remote learning and education inequalities* (GLO Discussion Paper No. 679). Global Labor Organization.

Pensiero, N., Kelly, A., & Bokhove, C. (2021). Learning inequalities during the Covid-19 pandemic. A longitudinal analysis using the UK Understanding Society 2020 and 2021 data. (Project Report). University of Southampton. https://doi.org/10.5258/SOTON/P0118

Reimer, D., Smith, E., Andersen, I. G., & Sortkær, B. (2021). What happens when schools shut down? Investigating inequality in students' reading behavior during Covid-19 in Denmark. *Research in Social Stratification and Mobility*, *71*, 100568. https://doi.org/10.1016/j.rssm.2020.100568

Shelton, J. T., Elliott, E. M., Lynn, S. D., & Exner, A. L. (2009). The distracting effects of a ringing cell phone: An investigation of the laboratory and the classroom setting. *Journal of Environmental Psychology*, *29*(4), 513–521. https://doi.org/10.1016/j.jenvp.2009.03.001

Smith, J. G. (2006). Parental involvement in education among low-income families: A case study. *School Community Journal*, *16*(1), 43–56.

Thomas, K. M., O'Bannon, B. W., & Bolton, N. (2013). Cell phones in the classroom: Teachers' perspectives of inclusion, benefits, and barriers. *Computers in the Schools*, *30*(4), 295–308. https://doi.org/10.1080/07380569.2013.844637

Tomasik, M. J., Helbling, L. A., & Moser, U. (2020). Educational gains of in-person vs. distance learning in primary and secondary schools: A natural experiment during the COVID-19 pandemic school closures in Switzerland. *International Journal of Psychology*, *56*(4), 566–576. https://doi.org/10.1002/ijop.12728

UK Department for Education. (2022). *Secondary accountability measures: Guide for maintained secondary schools, academies and free schools*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1112046/Secondary_accountability_measures_2022_guide.pdf

UK Local Area. (2021a). *Beverley rural*. Retrieved August 8, 2021a, from http://www.uklocalarea.com/index.php?lsoa=E01012919&q=Beverley+Rural&wc=00FBND

UK Local Area. (2021b). *Orchard Park and Greenwood*. Retrieved August 8, 2021b, from http://www.uklocalarea.com/index.php?lsoa=E01012874&q=Orchard+Park+and+Greenwood&wc=00FANP

UNICEF. (2020). *Averting a lost COVID generation: A six-point plan to respond, recover and reimagine a post-pandemic world for every child*. https://www.unicef.org/reports/averting-lost-generation-covid19-world-childrens-day-2020-brief

UNICEF. (2021). *COVID-19: Schools for more than 168 million children globally have been completely closed for almost a full year, says UNICEF*. Retrieved December 24, 2021, from https://www.unicef.org/press-releases/schools-more-168-million-children-globally-have-been-completely-closed

Vigdor, J. L., Ladd, H. F., & Martinez, E. (2014). Scaling the digital divide: Home computer technology and student achievement. *Economic inquiry*, *52*(3), 1103–1119. https://doi.org/10.1111/ecin.12089

Vittorini, P., & Galassi, A. (2021). From blended to online due to the COVID outbreak: The case study of a data science course. *Open Learning: The Journal of Open, Distance and E-Learning*, *26*(3), 212–230. https://doi.org/10.1080/02680513.2021.1973399

Werner, K., & Woessmann, L. (2021). *The legacy of Covid-19 in education* (CESifo Working Paper No. 9358). Munich Society for the Promotion of Economic Research – CESifo GmbH.

Yanguas, M. L. (2020). Technology and educational choices: Evidence from a one-laptop-per-child program. *Economics of Education Review*, *76*, 101984. https://doi.org/10.1016/j.econedurev.2020.101984