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Who gets to learn in a pandemic? Exploring the digital divide in remote learning during the COVID-19 pandemic in Nigeria



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ABSTRACT

This study investigates the digital divide in access to remote learning for children in Nigeria, as a result of the COVID-19 pandemic. The data used in this study is from a survey conducted by The Education Partnership (TEP) Centre and the Nigerian Economic Summit Group (NESG), which sampled 557 students and 626 parents living in Nigeria. From the survey, we found: a relationship between the socioeconomic status and the digital divide in accessing remote learning, significant differences in students' access to remote learning opportunities during the pandemic, and significant differences in access to digital tools between students in government schools and their private school counterparts. We also found a statistically significant association between parental level of education and the ability to support children's remote learning during the pandemic.

1. Introduction

1.1. Background and Rationale

In the year 2000, heads of state and world leaders came together to institute the Millennium Development Goals (MDGs) that sought to meet certain developmental targets at the end of 15 years (2015). One of the goals the MDGs set to achieve was universal basic education. Since the time of the MDGs, developing countries have made substantial progress in closing the gap with developed countries in terms of school enrolment (Hanushek, 2013). The focus has now moved from not just school attendance but to learning and quality education through the Sustainable Development Goals (SDGs). Among developing regions, Sub-Saharan Africa recorded the highest progress in primary enrolment moving from 52% to 78% between 1990 and 2020. However, significant disparities persist in achieving SDG 4 which aims to provide quality and inclusive education for all school-aged children by 2030. Compared to their more affluent peers, children from the poorest households are four times more likely to drop out of school. There are also huge gaps between urban and rural areas (United Nations, 2020).

In November 2019, the novel coronavirus (COVID-19) was discovered in Wuhan, China. A few months after its discovery, the virus became a global pandemic affecting almost every country in the world; with the global economy and sources of livelihoods being heavily impacted. Due to measures to contain the pandemic, many countries insti-

tuted a shutdown of their economies which led to the closure of traditional school services. About 1.6 billion learners in 190 countries across the world were affected by the pandemic, with 94% of the world's school population impacted by school closures (United Nations, 2020). In Nigeria specifically, the school closures led to significant disruptions in the education system; especially learning modes and access to school related services. According to UNESCO (2020), the closure of schools affected 39,440,016 primary and secondary school learners across Nigeria, including those in internally displaced camps. In response to this education emergency, the federal and state governments and the non-state sector instituted measures to cushion the effect of the school closures by implementing various learning interventions using technological platforms, internet-based tools and traditional media. While the challenges of quality education existed prior to the pandemic, school closures came with inherent issues and concerns. Schooling opportunity in Nigeria is correlated with income level and access to quality education differs along the lines of socioeconomic backgrounds of students. Those students whose parents or guardians are willing and able to pay more to access better learning resources are more likely to attend private schools than their counterparts from lower socioeconomic households who are more likely to attend public education (Härmä, 2016; Obiakor & Adeniran, 2020; Rolleston and Adefeso-Olateju, 2014).

With the disruption to education caused by the COVID-19 pandemic and the subsequent adoption of remote learning across Nigeria, learners from financially privileged households represent the demographic that

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have more access to quality learning opportunities from the comfort of their homes (TEP Centre, 2020). As with inequality of access to traditional learning resources, the main correlates of this inequality of access to quality remote learning include demand-side factors such as limited or non-availability of digital devices and internet services in most homes and supply-side issues that include the lack of financial and technical capacity to transition from on-site to remote learning facilitation by many schools (TEP Centre, 2020). In light of the above, this study seeks to examine the inequity in access to remote learning during the COVID-19 pandemic in Nigeria within the framework of a digital divide and Bourdieu's theory of social and cultural reproduction. This study contributes new evidence to the digital divide literature in the context of a pandemic and addresses the specific research questions below.

1.2. Research questions

- 1 Which students are unable to effectively access learning during the COVID-19 pandemic?
- 2 Are there significant differences in learner access to digital tools and other remote learning materials?
- 3 Which parents are unable to support their children's learning remotely?

This study is divided into five sections. Section one above describes the background, study rationale and research questions. Section two addresses the review of the literature on digital divide and the theoretical framework situated within Bourdieu's theory of social and cultural reproduction. Section three discusses the data and methods employed in this study, section four covers the findings, and section five concludes with a discussion of the results, the study limitations and implications Table 3.

2. Literature review and theoretical framework

2.1. Conceptualising the digital divide

Since the latter half of the 1990s, the concept of *digital divide* was used to refer to the inequalities in access to and use of new media technologies between the so-called information "haves" and "have nots" (DiMaggio & Hargittai, 2001; van Dijk, 2005). The digital divide research especially between the late 1990s to mid-2000s was valuable in putting "the important issue of inequality in the information society on the scholarly and political agenda" (van Dijk 2005, p. 222) and was a useful benchmark for basic policy goals. Digital divide research largely uses a variety of sociodemographic and socioeconomic indicators such as income, gender, age, level of education and geographic location in explaining the first, second and third-level divides (Tirado-Morueta, Hernando-Gómez and Aguaded-Gomez, 2016); (Scheerder, van Deursen and van Dijk, 2017). Additional social determinants such as disability status (Choi & DiNitto, 2013), immigration status (Goodall, Ward & Newman, 2010) and relationship status (Yu et al., 2016) were found within the literature with varying conclusions. This body of literature has helped to explain who benefits most from internet use or who is falling behind.

As a conceptual approach, digital divide offers a useful contribution to understanding the relationship between Internet access and social inequality, however, scholars including (Van Dijk, 2005, 2006; Warschauer, 2003; DiMaggio & Hargittai, 2001) have questioned its deterministic tendencies. They argue that the digital divide concept suggests a sharp divide between two distinct groups and emphasises physical access to technology in very absolute terms. It is important to note however, that the term digital divide now broadly refers to a body of literature that explores the inequalities in internet access, including its uses and effects (Büchi, 2017).

2.2. Digital divide and learning in Nigeria

In the wake of the COVID-19 pandemic, educational systems transitioned into new methods of learning aided by the internet but children in rural and underserved communities in Nigeria were mainly left out of this digital transition Amorighoye (2020). Findings from the TEP Centre (2020) study revealed that a sizeable proportion (28%) of teachers reported that their students were not actively learning during the pandemic as a result of inaccessibility of digital tools for learning. According to the International Telecommunication Union (2019a), internet penetration in Nigeria stands at 42%, implying that more than half of the population were not connected to the Internet, and even fewer if the consideration of multiple device use by Nigerians is factored in. On the other hand, mobile adoption in Nigeria shows great potential which can also be harnessed for learning (International Telecommunication Union (ITU), 2019b).

In Nigeria, majority of the population with internet access are from richer socioeconomic and urban households who can afford private school education, thereby giving their children a learning advantage over their public-school counterparts (Obiakor & Adeniran, 2020). Children from poorer socioeconomic backgrounds tend to have limited access to internet connectivity, computers, mobile phones, functional ICT skills and active parental support. Moreover, they dwell in rural areas where local languages are dominant and could limit the uptake of ICT-learning. The inequity in access to ICT-based learning has the adverse effect of further intensifying the existing disparities in learning outcomes along socioeconomic and geographic (urban-rural) lines (United Nations, 2020; Rubagiza, Were and Sutherland, 2011; Furuholt, and Kristiansen, 2007).

Studies from other African countries corroborate these existing divides. In South Africa, students in private or high-fee paying institutions were more proficient in the use of ICT in their learning than their counterparts in public institutions (Gudmundsdottir, 2010). A study by EdQual on the use of ICTs in Rwandan schools, showed how ICT policy initiatives could tend to exclude those in rural areas. Urban schools had more computers, internet, electricity supply and ICT equipment (Rubagiza, Were and Sutherland, 2011). Chair and De Lannoy's (2018) study of Nigeria, Tanzania and Rwanda showed that young people especially in rural areas, were deprived of internet resources due to low-level of education, low income and lack of digital skills. As the pandemic led many children across the world and in Nigeria to learn at home, it is important to understand how children accessed learning remotely and the support and provisions that were available for them to learn effectively.

2.3. Theoretical framework

2.3.1. Bourdieu's theory of social and cultural reproduction

Within education, some digital divide scholars have built on Bourdieu's (1986) work on social, economic and cultural capital. Social capital refers to institutionalised relationships and connections, economic capital implies assets that have monetary value and cultural capital is evident in the form of educational attainment. These varying forms of capital are connected such that a lack of one may cause disadvantages in the other (Bourdieu, 1998). In light of a digital divide, the lack of economic capital (wealth) could lead to a corresponding lack of internet access, which has become necessary for education attainment (cultural capital). Scholars such as (Correa, 2015; Hargittai & Hinnant, 2008) highlight how highly educated individuals tend to have greater levels of digital competencies which also enable them to use the Internet more productively. Ullah & Ali (2018) also explore the how differences in social class background and educational opportunities (for students in public schools, elite private schools and ordinary private schools), systematically contribute to maintain the status quo, as parents work with schools to ensure their children's success within and outside school. They point that elite children who attended prestigious

private schools, were more advantaged in terms of professional career aspirations, active parental involvement in their education/homework, and access to private tutors.

In the same vein, this paper draws significantly from Bourdieu's theory of social and cultural reproduction in understanding the educational and digital inequalities of learners in Nigeria amidst COVID-19. Being a form of cultural capital, education is more accessible to those with a higher amount of cultural capital as inherited from their parents through wealth or position (DiMaggio, 1982). Schools as educational contexts, also reinforce or reproduce existing hierarchies or stratification systems in the society (Naidoo, 2004). In situating our argument of the social reproduction of cultural capital, this study argues that children inherit cultural capital from their parents which are reproduced as digital skills in the digital economy. As (Bourdieu and Passeron, 1977) posit, children of the affluent class tend to receive more cultural capital than others through a variety of knowledge, dispositions and skills which ultimately make them better off economically. Hence, this paper seeks to see how inequalities in different school types (public schools and private schools), socio-economic backgrounds and family-based endowments shaped student's access to remote learning via digital access amidst the COVID-19 pandemic in Nigeria.

3. Data & methodology

3.1. Data

The data used in this study is from a survey conducted by The Education Partnership (TEP) Centre and the Nigerian Economic Summit Group (NESG) from April to May 2020¹. The survey was administered to 1,901 respondents through an online form and telephone interviews. The survey respondents include government officials, teachers, private organisations, private school representatives, parents and students. In addition to the closed-ended survey questions which provided the quantitative data for this study, the questionnaires included several open-ended questions that allowed respondents to report their perspectives and give in-depth responses to some questions, which provided qualitative data. Therefore, this study is a mixed-methods study that has both qualitative data and quantitative data which are both included in the analysis of this research. The study sample represents residents from 35 of the 36 states in Nigeria, including the Federal Capital Territory and we aggregated state of residents into regions of residents using Nigeria's official geo-political zonal arrangements². The data was collected anonymously, and the principles of informed consent were strictly adhered to. For participants below 18, parental consent was sought before proceeding with the interview. To ensure the validity of the data collected by phone interviews, data verification was conducted by selecting a random sample of about 10% (87) of the respondents who were interviewed via phone. Of the respondents that were telephoned, 86 respondents confirmed they were interviewed. Therefore, approximately 99% of the randomly selected respondents for verification, confirmed that they were interviewed. In this study, we focus on data collected from parents and students with samples sizes 626 and 554 respectively

3.1.1. Student sample

The student sample was made up of 554 students across 31 states in the six regions in Nigeria. Students were from different school types: public and private schools. 38% were enrolled in higher institutions, 26% attended senior secondary schools, 14% attended junior secondary schools and 25% were enrolled in primary schools. The average age in the sample was 16.8 years. 59% of the students were female and 41% were male. 51% of the respondents attended private schools while 49%

¹ For more information on the data and study please visit <https://www.tepcentre.com/report-paper/>

² There are six regions in Nigeria namely; North-Central, North-East, North-West, South-East, South-South and South-West.

of the respondents attended government (public) schools. Table A1 in the appendix provides the students demographic information.

3.1.2. Parent sample

The parent sample was made up of 626 parents across 30 states in the six regions in Nigeria. The average age of the parents in our sample was 40.6 years. There were more female respondents (58%) than male respondents (42%). With regards to the educational level of the parents, 34% of the parents had attained a bachelor's degree, 26% had a master's degree, while 13% had senior school leaving certificate and only 1% had a PhD. For the sake of the analysis in this study, we categorize parents' educational level into two; secondary educational level and below and post-secondary (above secondary) educational attainment. Table A2 in the appendix provides the parents demographic information.

3.1.3. Methodology

In analysing the data, we employ a mixed methods approach using both quantitative and qualitative analysis. For the quantitative data, we used both descriptive analysis and probit regression models. For the outcome variables, we estimated the probabilities that a student or parent will answer yes to the outcomes of interest (remote academic engagement, challenges learning remotely, the need for remote learning tools and parents ability to support children's remote learning) as a function of their school type (for students) and education level (for parents), we also estimated these probabilities controlling for factors such as gender, region of residence and education level. We reported the estimated coefficients for each probit regression model and in interpreting the results, we estimated the impact effects³ of school type (for students) and education level (for parents) on the outcome of interests in each case. In analysing the qualitative data, we employed thematic analysis using Microsoft Excel to segment the data with preliminary codes (School-level differences, Access and Infrastructural challenges, Pedagogical Challenges, Parental Involvement). Using these codes, we then searched for patterns/themes across the qualitative responses and defined them within the context of the theoretical framework. These themes informed the direct quotes from respondents that were reported in the study (see Section 4 below).

4. Results

4.1. Access to remote learning in the pandemic

Students were asked if they had been remotely academically engaged during school closures, that is, learning while at home; and the findings revealed that 30% of the respondents were not academically engaged. Of the number of students that reported not being academically engaged, 71% were attending government schools, and 29% were attending private schools. We estimated the association between school type and a student being academically engaged remotely in a probit regression reported in Table 1 below. School type was found to be statistically significant in predicting the probability that a student reports that they were academically engaged.

We then estimate the impact effect of attending a private school on being academically engaged remotely during the pandemic to aid the interpretation of our findings. We find that attending a private school increases the probability of being academically engaged by 25.5 percentage points and when we account for the student's gender, region

³ Impact (marginal) effects is used to express how the predicted probability of a binary outcome (dependent variable) changes with a change in the independent variable of interest or risk factor (Norton et al, 2019). Impact effects provide a more intuitive interpretation of the results than the reported probit coefficients (which reports that a small change in the value of the regressor changes the probit index by the standard deviation of the estimated coefficient), for the sake of the interpretation and discussion, we used the impact effects of the estimated results.

Table 1
Estimated Coefficients for the Probit Model of Student Remote Academic Engagement.

Variables	School type only	School type and other controls
School type (1= private, 0=Government)	0.790*** (0.117)	0.419** (0.170)
Gender (1=male, 0=female)		-0.0926 (0.125)
North East (base group: North Central)		0.0189 (0.245)
North West (base group: North Central)		-0.547* (0.285)
South East (base group: North Central)		-0.0413 (0.210)
South South (base group: North Central)		0.203 (0.221)
South West (base group: North Central)		0.676*** (0.188)
Higher Institution (base group: Lower primary)		-0.630** (0.261)
Junior Secondary (base group: Lower primary)		0.0365 (0.261)
Senior Secondary (base group: Lower primary)		0.0942 (0.254)
Upper Primary (base group: Lower primary)		-0.0620 (0.275)
Constant	0.161** (0.0762)	0.403 (0.300)
N	554	554

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

of residence, and the student's education level, we find that attending a private school increases the probability that a child is academically engaged by 12 percentage points and the effect in both cases are statistically significant, indicating that private school students were more likely to access learning remotely than their government school counterparts.

When asked if the students faced any challenges learning online, 64% of the respondents reported that they faced challenges learning online, of that number, students attending government schools represent 54% of the sample of respondents who reported that they face challenges learning online versus 46% their private school counterparts. We find that the association between school type and whether a student reports that they face challenges learning online is statistically significant. In [Table 2](#) below, we report the estimated coefficient of the probit model of the probability that a student will report that they faced challenges learning remotely.

We estimated the impact effect of school type on the probability that a student reports facing challenges learning remotely. We find that attending a private school reduces the probability that a student will report that they faced challenges learning remotely by 12 percentage points and when we hold the student's gender, region of residence, and the student's education level constant, attending a private school reduces the probability that a student will report that they faced challenges learning remotely by 11 percentage points. The effect on school type on remote learning challenges is statistically significant at the 95% level of significance. These findings indicate that the type of school a student attends significantly affects their access to remote learning.

This disparity between public and private students' access to remote learning was also evident in the qualitative data. One parent (Male, 38) rated the instructional learning programme of his state as 2 out of 5. He explains the differences between the learning experiences of his daughter enrolled in a private primary school and another who was a public secondary school student.

"(...) I was also hoping the (...) government will do better than the private school system, but my daughter in Private school (Primary 4) seems to be learning more within this period."

4.1.1. Access to digital tools and other remote learning materials

Students who were learning remotely were asked about the challenges they faced learning online during the pandemic, the main challenges reported were access to electricity, access to devices, phone credit and internet data; and poor internet connection. 38% of the student respondents reported that the main challenge with learning online was affordability of phone credit and internet data. 28% reported that access to digital devices was the main challenge they faced, while 24% reported that electricity was the main challenge with learning online, 8% reported that access to the internet was the main challenge and only 2% reported other issues were responsible for their remote learning challenges.

In analysing access to digital tools by students in our study sample, we aggregated the challenges linked to accessing online classes (i.e. internet data, devices and internet connectivity) as digital access tools and examined this challenge by school type. We find that students in government schools were more likely to report that accessing digital tools to learn online was their main challenge with learning. In further analysis of the differences between the type of school an student attends and the main challenges they faced with remote learning, we did not find any statistical significant effect, however it is important to note that majority of the students reported that access to digital tools (internet data, devices and internet connectivity) was the key hinderance to learning remotely.

4.1.2. Student remote learning needs

Students were asked what resources they needed in order to learn the way they wanted to while at home. Students attending government schools are more likely to report that they needed digital tools to access remote learning during the pandemic. 53% reported that they needed internet enabled mobile phones, 55% needed access to the internet and 51% reported that they needed laptops and only 9% reported the needed nothing (reported as *I have all I need to learn the way I want*). We further analysed the reported student needs as a function of school type using a probit regression model in [Table 4](#) below. We find that school type significantly impacts a student's response to their need for internet connectivity for learning and whether the reported that they had all they needed to learn.

Table 2
Estimated Coefficients for Probit Model of Challenges of Learning Remotely.

Variables	School type only	School type and other controls
School type (1= private, 0=Government)	-0.320*** (0.110)	-0.313** (0.152)
Gender (1=male, 0=female)		0.0942 (0.115)
North East (base group: North Central)		0.477* (0.248)
North West (base group: North Central)		-0.518* (0.280)
South East (base group: North Central)		0.554*** (0.210)
South South (base group: North Central)		-0.0316 (0.206)
South West (base group: North Central)		0.370** (0.177)
Higher Institution (base group: Lower primary)		0.147 (0.233)
Junior Secondary (base group: Lower primary)		0.168 (0.224)
Senior Secondary (base group: Lower primary)		0.149 (0.214)
Upper Primary (base group: Lower primary)		0.298 (0.241)
Constant	0.513*** (0.0796)	0.0919 (0.270)
N	554	554

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3
The Main Challenge Students Experienced Learning Online Disaggregated by School Type.

Main challenge	Respondents	Government (%)	Private (%)
Electricity	83	53.0	47.0
Digital access tools	253	55.6	44.4
Others	9	11.1	88.9
Total	351	53.9	46.2

We further estimated the impact effect of school type on the students' needs for studying the way they want and we find that attending a private school reduces the probability that the student will be in need of internet to study the way they want by 8.9 percentage points and attending private increases the probability that a student reports that they have all they need to study the way they want by 9 percentage points and the effects are statistically significant.

The qualitative responses also showed nuanced differences in student's ability to access learning based on the quality of their internet connections, their digital skills/experience and the availability of learning support through a teacher or parent. Some students who had access to the internet, were still hindered from learning effectively due to poor internet connectivity. Some who also had access to online learning could not fully participate without an understanding of how digital learning

works. The words of a 16-year female student summarises this experience:

Poor network sometimes makes the class tiring. I have trouble submitting my assignment on the app. When I don't understand I can't call back the teacher.

4.1.3. Parents ability to support their children's learning remotely

When asked if they supported their children's remote learning during the pandemic, 83% of parents reported that they actively supported their children's remote learning and 17% reported that they were not actively supporting their children's remote learning.

We examined the responses of parents to the question of supporting their children's remote learning by their level of education using a probit regression model. Table 5 above indicates that parents who had attained above secondary education were more likely to answer yes to supporting their children's remote learning. The effect of parental education is statistically significant and remains significant when we control for the parent's gender and region of residence. To aid the interpretation of the coefficients, we estimated the impact of effect of parental education on parent's support of their children's remote learning and we find that having the probability that a parent was actively supporting their child's remote learning increases by 14.4 percentage points if the parents had above secondary education and the effects remain statistically significant when we control for their gender and region of residence. In the

Table 4
Estimated coefficients for probit model of what Students Need to Study the Way They Want.

	(1)	(2)	(3)	(4)
What would you need to study the way you want	Internet-enabled mobile phone	Internet	Laptop	Nothing
School type (1= private, 0=Government)	-0.161 (0.107)	-0.225** (0.107)	-0.0964 (0.111)	0.582*** (0.161)
Constant	0.0138 (0.0759)	0.0781 (0.0759)	0.461*** (0.0789)	-1.668*** (0.130)
N	547	547	547	547

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5
Estimated coefficients for probit model of Parents Supporting Their Children’s Remote Learning

Variables	Education level only	Education level only plus other controls
Education (1=Above secondary, 0=Secondary and below)	0.678*** (0.146)	0.657*** (0.156)
Gender (1=male, 0=female)		-0.0832 (0.134)
North East (base group: North Central)		-0.0654 (0.318)
North West (base group: North Central)		-1.093*** (0.276)
South East (base group: North Central)		0.00643 (0.317)
South South (base group: North Central)		-0.170 (0.284)
South West (base group: North Central)		0.135 (0.250)
Constant	0.431*** (0.128)	0.628** (0.274)
N	625	618

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6
Estimated Coefficients for Probit Model of Why Parents are Unable to Support Their Children’s Learning Remotely

Variables	I don’t know how	Someone else	Too busy	Too Costly
Education (1=Above secondary, 0=Secondary and below)	-0.832*** (0.270)	-0.108 (0.274)	0.604** (0.287)	-0.461 (0.318)
Constant	0.223 (0.217)	-0.458** (0.223)	-0.821*** (0.243)	-0.821*** (0.243)
N	104	104	104	104

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

student’s data, many students who gave their learning interventions a good rating⁴ attributed it to the presence of a parent or home tutor who supported their learning. A four-year-old student from Taraba state in North-eastern Nigeria shared that her parents taught her how to access the internet and learn spellings through digital platforms. On the other hand, some students did not have the luxury of this kind of support. A student (male, 9 years) whose school used WhatsApp to conduct remote learning, acknowledged that this was only possible because his mother was educated and used the digital platform herself.

“... we depend on our mother to teach us. So, if she is not educated and has no WhatsApp, we will not be able to participate in the program.”

4.2. Reasons for parents inability to support their children’s learning remotely

For parents who were not supporting their children’s remote learning (17% of the respondents), the reasons they reported were: lack of know-how, busyness, someone else doing it or costliness. Parents’ responses to this although non-mutually exclusive, show that 38% reported that they were not supporting their children’s remote learning, because they did not know how. 35% reported that they were too busy to support their children’s remote learning. We further analysed parents’ reasons for not supporting their children’s learning as a function of their education level.

We found that there was a significant association between the parents’ level of education and if they reported that they were not support-

ing their children’s learning because they lacked the know-how, or they were too busy. Table 6 above reports that the parents who said they didn’t know how to support their children’s remote learning were more likely to be parents who had attained only secondary education or less than secondary education and parents who reported that they couldn’t support their children’s remote learning because they were too busy were more likely to have attained above secondary education, however the statistical effect is less significant than the effect of know-how on the probability of supporting students remote learning.

Beyond education level, the qualitative responses showed that parents’ ability or inability to afford internet connection, multiple -or sufficient number of- ICT devices, constant electricity and private tuition/home tutors, influenced how well they could support their children’s learning amidst the pandemic.

“Sometimes we don’t have light so he can’t access the radio and TV lessons and the e- learning isn’t always convenient because it’s data costly and my son can’t meet his teacher when he doesn’t understand something because may other students have complaints too on the platform (Parent, Female, 43)

My children keep using my phone and they are distracted because I have things to do with my phone (Parent, Male, 39)

For parents who could not be fully present, the ability to provide a home tutor appeared to be a strong factor in ensuring their children’s continued learning.

The home lesson teacher is teaching well, they have learnt new things on radio while the online learning keeps them busy and proactive (Parent, Female, 40)

However, not all parents could afford this, as a few parents expressed the need for financial assistance to provide private tutors for their children.

⁴ Students were asked to rate the effectiveness of the remote learning tool they were using to learn. The ratings were captured on a five-point scale from very poor to very good.

5. Discussions & conclusion

5.1. Discussion

Our findings reveal that there were significant differences in students' access to remote learning opportunities during the COVID-19 pandemic in our sample of respondents. Affordability of phone credit and internet data was the main challenge identified, other challenges reported by students include; electricity and access to devices. This is not surprising given that internet penetration in Nigeria is still at 42%, meaning that more than half of the population is not online (International Telecommunication Union, 2019a). Our results show differences in access to digital tools (internet data, devices and internet connectivity) between students in government schools and their private school counterparts. We found that a higher percentage of public-school students compared to private school students reported access to digital tools as a challenge to remote learning. Also, students from public schools were less likely to be academically engaged compared to those in private schools. We found a statistically significant association between school type and whether a student reports that they face challenges learning online or not. Students from government schools were also more likely to need tools to access digital learning during the pandemic compared to their private school colleagues.

The above findings corroborate existing literature (see [Obiakor & Adeniran, 2020](#); [Gudmundsdottir, 2010](#)) on the digital divide whereby disadvantaged populations have limited access to electricity and technological infrastructure. Given the link between socio economic status and school type, the findings also validate Bourdieu's theory of Social and Cultural Reproduction given that digital and educational inequalities are linked to classical inequalities in the form of social and cultural capital. Similar to [Ullah and Ali \(2018\)](#)'s study of differences between elite/ordinary private and public schools in Pakistan, students from private schools in Nigeria were less likely to have challenges accessing digital tools or learning online during the pandemic. Our results demonstrate that students who attended public schools and are most likely from poorer socioeconomic backgrounds have less access to remote learning and are more likely to report needing access to digital tools. School-type therefore reflect existing hierarchies in society even in a situation where students are learning from home.

In the Nigerian context, these results also align with previous findings ([Osunwusi & Abifarin, 2013](#)) that private secondary school students not only have better home access to computers and the internet, but also stronger digital knowledge and skills than their public-school counterparts. Linking this to the concept of cultural capital, affluent students benefit not just from learning in school, but inherit from their parents, an eclectic mix of skills, knowledge and dispositions which puts them significantly ahead of their peers. Consequently, this study used parental education as an indicator for measuring the link between socioeconomic backgrounds and parents' ability to support their children's remote learning. We found a statistically significant association between parental level of education and ability to support children's learning amidst the pandemic. In light of the COVID-induced, digital learning context in Nigeria, these findings demonstrate the role of parental education as a form of cultural capital that reproduced as digital skills for necessary learners to adapt swiftly. Similarly, there is extant literature ([Lloyd & Hewett, 2003](#); [Filmer & Pritchett, 1999](#); [Mishra et al., 2020](#)) showing the relationship between educational attainment and income level, and the correlation between income level and home-based parental involvement. Evidence from European countries shows that children from lower socioeconomic backgrounds are more likely to lack reading opportunities, a quiet place to study, and parental support during school closures ([European Commission, 2020](#)). Similar trends exist in African countries like Madagascar and Sierra Leone, where children from the poorest quintiles received significantly less help with their homework ([Mishra et al., 2020](#)).

Among parents who indicated that they did not know how to support their children's learning, a majority did not have post-secondary education. The qualitative responses also suggest a positive relationship between socioeconomic backgrounds and parental involvement. Relatively richer parents are able to afford internet connection, multiple (or sufficient) ICT devices, constant electricity and private tuition/home tutors. Beyond being able to help their children directly, relatively richer Nigerian parents who could afford to get a private tutor, popularly known as "lesson teacher" are able to bridge the learning gaps that they may not have the time or knowledge to address. This aligns with the findings of [Ullah and Ali \(2018\)](#) in which parents whose children attended elite schools were more actively involved with their children's education and homework and also provided private tutors. [Cashman, Bhattacharjee and Sabates \(2020\)](#) in their study of rural India similarly found that affluent parents were more likely to accurately diagnose their children's learning needs and provide active support, as they themselves were educated. However, poorer parents may not have the knowledge or resources to provide the same level of support. In fact, poorer parents in were 12 percentage points less likely to have someone at home to support their children's learning.

5.2. Study limitations

Our analysis has focused on access to learning during the pandemic in Nigeria and juxtaposes key issues that relate to the digital divide and socio-cultural inequalities in access to learning remotely. One of the limitations of the study is that data was not collected specifically to measure location (rural -urban divide) and Socioeconomic Status (SES) of the survey respondents. As identified in the literature, one factor responsible for the digital divide among students is the socioeconomic background of their parents ([Cigna, 2018](#); [Venkataswamy, 2015](#)). In this study, our link from SES to digital divide is through the type of school attended by students. We know from literature on school attendance and socioeconomic status that students from more privileged backgrounds are more likely to attend private schools than their counterparts from poorer backgrounds ([Grimm, 2011](#)). [Piovesan et al \(2011\)](#) also argue in their study on dental caries in preschool children in Brazil that school type is a reliable alternative indicator to SES.

Similarly, parental education and SES have been found to be strongly linked as a proxy for SES. According to [Scheerder et al \(2017\)](#), a person's educational level is considered one of the most important factors when studying digital divides. Our results in both instances meet our a priori expectations that SES is associated with whether a student can access remote learning through access to digital tools for learning. Our data may also be limited by the survey timeframe, the data was collected during the period of restrictions and national lockdown, we are unable to say how remote access to learning changes for children after the restrictions have been lifted. We also submit that our study does not make causal claims between SES and access to remote learning, and the results may vary in more sophisticated quantitative analysis. However, using a mix method research strategy strengthens our findings, as it gives a voice to our study participants and ensures that our findings are grounded in their experiences which gives us more nuanced evidence beyond the numbers.

5.3. Conclusion and implications

This study has contributed to the literature on digital divide and social and cultural reproduction of educational inequalities in Nigeria, specifically during the COVID-19 pandemic, national lockdown and school closures in the country. We found that a digital divide does exist in this context and is related to socioeconomic status of children as measured by the type of school they attended and the educational attainments of their parents. Digital skills are important for the twenty-first century labour market and we posit that such inequalities in access to digital tools and skills could further exacerbate social and educational

inequalities as students transition from school to the labour market. We make a case for policy efforts to tackle this digital divide and the resulting inequality in access to learning for all children.

Implications for further research are clear. There is a need for research that seeks to understand the extent of the digital divide beyond the scope of the lockdown period. As schools re-open and education provision resumes, understanding how digital skills development during the pandemic for some children may further exacerbate social and educational inequalities becomes even more important as children within similar classrooms may now be learning differently. [TEP Centre \(2020\)](#) reported that the COVID-19 pandemic led to a higher adoption of digital learning and some parents in this study reported that their children adapted well to learning online and improved their digital skills, while others did not. This raises further concerns because as we move to a post-COVID-19 era, these skills are likely to become more important for the future of work and productivity. Those who are not actively engaging in the use of digital tools for learning and who may not be able to do so, become youths with limited digital skills as they transition to the labour market. This merits a case for future research on digital divide amongst the youth in Nigeria and its labour market consequences. Furthermore, this question remains and should be posed: whether or not children had access to digital tools for online learning, did actual learning take place? And this must remain front and centre; exploring whether the flurry of activity related to access also has an effect on children’s learning outcomes is pertinent in the discourse of access to digital tools and learning outcomes.

In relation to policy implications, access to the internet and remote learning in Nigeria is limited by infrastructural deficiencies. There is a need for education stakeholders and policy makers to pay attention to the issue of internet use and who gets to learn remotely both because they cannot afford to and because of the lack of the infrastructural provisions that excludes students from low-income households. [Cigna \(2018\)](#) recommends that there should be concentrated efforts to uncover the multi-faceted issue of digital inequality, which could ultimately lead to a case of twenty-first century inequalities. Current and future policy efforts should aim to support children from disadvantaged socioeconomic backgrounds to acquire not only physical access to the internet and other digital tools, but also the skills necessary to utilise the internet for learning. This could in fact be a tool for reduction of social inequalities in education as students can now access more informa-

tion that could improve their academic achievement and foster lifelong learning skills ([Heemskerker et al. 2005](#)).

In conclusion, the scope of educational disruption caused by COVID-19 is unprecedented in history. On one hand, the pandemic has opened opportunities for innovation and resilience in education, which could bolster post-pandemic recovery. On another hand, this study shows that the multifaceted socioeconomic impact of COVID-19, disproportionately affects the poor and vulnerable as seen in the Nigerian case. It is evident that a significant number of school-aged children may not be learning at all due to limited socioeconomic means and exclusion from remote learning opportunities ([Kazeem, Jensen and Stokes, 2010](#); [TEP Centre, 2020](#); [Obiakor & Adeniran, 2020](#)). Given the widening digital divide, there is an urgent need for a more collaborative approach across actors and sectors (government, civil society, business, international community), so that no one is left behind. All stakeholders must recognise their role in ensuring the equitable delivery of education to mitigate learning losses for every child and young person in Nigeria.

Declaration of Competing Interest

None

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Appendix

[Table A1, A2](#)

Table A1
Descriptive Statistics of Students Sample

Region	Gender (N)		School type (N)		Education Level (N)					Age (Mean & SD)		Overall (N)
	Female	Male	Government	Private	Lower Primary (1-3)	Upper Primary (4-6)	Junior Secondary (1-3)	Senior Secondary (1-3)	Higher Institution	Mean	SD	
North	47	36	62	21	6	5	2	8	62	20.5	7.13	83
Central												
North	26	18	26	18	6	2	4	6	26	19.4	7.58	44
East												
North West	10	21	12	19	3	7	5	6	10	15.8	6.87	31
South	52	33	39	46	15	10	18	8	34	16.5	7.78	85
East												
South	54	34	28	60	17	12	23	16	20	13.8	6.59	88
South West	136	87	106	117	14	23	24	101	61	16.3	5.08	223
Total	325	229	273	281	61	59	76	145	213	16.8	6.72	554

Table A2
Descriptive Statistics of Parents Sample

Region	Gender (N)			Age (Mean & SD)		Educational Level		
	Female	Male	Total	Mean	Standard Deviation	Secondary education and lower	Above Secondary education	Total
North Central	26	24	50	37.9	6.14	5	45	50
North East	20	33	53	40.2	6.89	3	50	53
North West	36	34	70	39.7	9.84	17	53	70
South East	55	5	60	35.1	7.17	7	53	60
South South	61	25	86	37.8	6.52	14	72	86
South West	163	137	300	43.1	9.41	56	243	299
Total	361	258	619	40.6	8.86	102	516	618

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