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educational inequalities:  
Evidence from Nigeria**

Oludele Folarin  
Adedeji Adeniran  
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## Abstract

This study unpacks the impact of the COVID-19 pandemic on educational inequalities and related education policy measures in Nigeria. Focusing on primary education, the study aimed to: (i) outline the state and dimensions of educational inequalities in Nigeria before the pandemic; (ii) understand the impact of COVID-19 on student learning performance; (iii) evaluate education-related pandemic measures and their impact on educational inequalities; and (iv) provide policy recommendations on how existing policy responses can be improved to reduce educational inequalities.

Using both quantitative and qualitative data, the study shows that educational inequalities increased during the pandemic across vulnerable groups, particularly low-income families, and children in rural areas. The results reveal a distinct pandemic-related learning loss among students. The dip in performance during the pandemic can be attributed to factors such as prolonged school closures, increased student leisure time, compromised nutrition, and lack of guidance from teachers.

Five key recommendations are made to build resilience in the educational sector and restore progress towards achieving SDG 4 (quality education), namely to: (i) upscale the accelerated learning programme; (ii) increase investment in communication and digital infrastructure; (iii) integrate digital learning into teaching; (iv) invest in adult education programmes; and (v) upscale teachers' skills.

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## Acronyms and abbreviations

<b>FGD</b>	Focus group discussion
<b>KII</b>	Key informant interview
<b>NECO</b>	National Examination Council
<b>SDGs</b>	Sustainable Development Goals

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# **COVID-19 and rising educational inequalities: Evidence from Nigeria**

*Oludele Folarin  
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Emmanuel Nwugo*

## **Introduction**

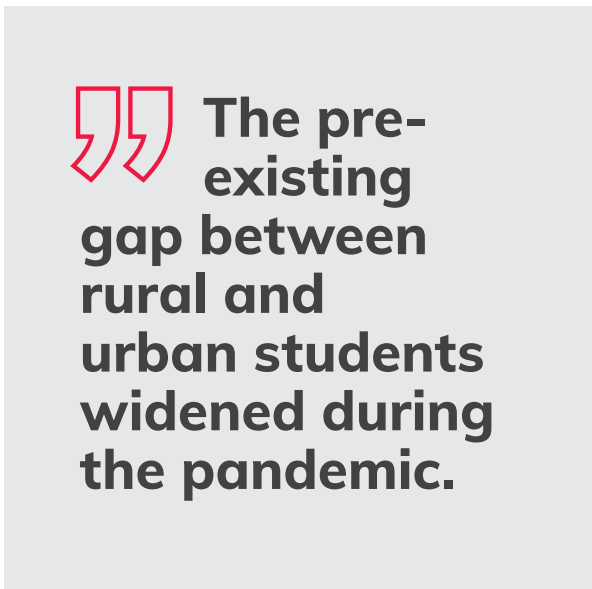
Educational inequality describes disparities in educational opportunities between different socio-economic, regional, and cultural groups. These inequalities are measured by access to education and the quality of available education across these different groups, and are particularly pronounced in relation to gender, geographic location, and income level. As Farquharson, McNally, and Tahir (2022) suggest, individuals with limited access to quality education are more likely to end up in low-wage, low-skilled jobs, contributing to persistent poverty and income inequality. More widely, as highlighted by Archibong (2018), high levels of educational inequality can limit human capital development and slow down economic growth. Overall, reducing educational inequality is a critical aspect of achieving SDG 4, which aims to provide inclusive and equitable quality education for all. Yet, ensuring education equality not only accelerates progress towards SDG 4, but also contributes to sustained economic growth, poverty reduction, gender equality, public health, conflict resolution, and supports a shift towards sustainable production and consumption (United Nations Development Programme [UNDP], 2023).

The COVID-19 pandemic, and associated lockdown-related policy measures, have exposed and further exacerbated educational inequalities in Nigeria. More specifically, vulnerable groups such as girls, children in rural areas, and those from low-income families, have been disproportionately affected by school closures and disruptions in learning due to a lack of access to digital technologies and online learning platforms (Ahinkorah et al., 2021). Consequently, the gap in educational attainment between these groups and those with greater access to technology and resources has widened (Ahinkorah et al., 2021).

Prior to the pandemic, there were already significant disparities in educational quality between low- and high-income nations (Winthrop & McGivney, 2015). The pandemic has, however, exacerbated unequal access to quality education, particularly in low-income countries (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). As high-income countries transitioned to remote learning, primarily facilitated by

online classes, the digital divide between high-income and low-income countries became stark. The lack of readily available resources such as internet connectivity and computers meant that alternative learning methods, such as radio and television-based education, had to be deployed in low income countries. Yet, the efficacy of these alternatives paled in comparison to the advanced, technology-driven approaches employed in high-income nations (Hossain, 2021). As a result, while both low and high-income nations suffered from learning loss, the impact was less severe in high-income countries with a greater capacity for internet-enabled learning. In this regard, children whose parents cannot afford home tutors or alternate learning platforms during school closures are more likely to perform poorly upon restart, based on pre-existing educational disparities (Moscoviz & Evans, 2022; Angrist et al., 2021). As a result, the pandemic is likely to increase future education gaps and make it harder to achieve SDG 4.1. (universal primary and secondary education) (World Bank, 2022c).

Furthermore, children from lower socio-economic backgrounds are at heightened risk of dropping out of school (World Bank, 2022c). In Nigeria, dropout students made up about 27% of the 10.6 million out-of-school students in 2019, a share which has increased post-pandemic since the pandemic forced around 7% of school-aged students in Nigeria to drop out of school (Dessy et al., 2021). Educational outcomes in Nigeria were below average for developing countries before the pandemic (World Bank, 2022c). In 2018, the school enrolment rate in Nigeria among primary school-aged children—which is the ratio of children of official school age who are enrolled in school to the corresponding official school age population—was about 87.5% (World Bank, 2022b). This rate compares unfavourably to the regional average of Sub-Saharan Africa (99%), East Asia & Pacific (102.1%), Europe & Central Asia (100.9%), Latin America & Caribbean (108.5%), Middle East & North Africa (104.3%), and South Asia (99.6%), and also at the national level to some African countries including Benin (122%) and Tanzania (94%).



**The pre-existing gap between rural and urban students widened during the pandemic.**

When considering gender, the gender parity index—which is used as a measure of access to education among males and females—stood at 0.94 in 2018, suggesting that in Nigeria, for every 100 boys enrolled in schools, only 94 girls attended school (IIEP-UNESCO & World Bank, 2021). Also, among both boys and girls, the enrolment rate

is higher in urban than in rural areas by more than ten percentage points (IIEP-UNESCO & World Bank, 2021).

The Nigeria Living Standards Survey of 2018-2019 (IIEP-UNESCO & World Bank, 2021) shows that primary school enrolment in urban and rural areas was 99% and 84% respectively for girls, and 99% and 87% respectively for boys, suggesting significant geographical inequality in access to education between rural and urban areas. The low enrolment rate in rural areas is primarily due to limited government spending and negligence of education in rural areas (Adeniran et al., 2019) aggravated by the pandemic and associated disruptions. In turn, this has exacerbated the gap between enrolment rates in urban and rural areas. This means that primary school-aged children in rural areas are even less likely to be enrolled in school, which could have long-lasting effects on their education and future opportunities.

Moreover, when analysing students' performance using large-scale learning assessments, there is a notable inequality in learning outcomes, with urban students, on average, outperforming those residing in rural areas in literacy and numeracy tests (Nigeria Education Data Survey, 2015). The 2015 Nigeria National Education Data Survey (NEDS)<sup>1</sup> shows that the average pass rate in literacy for primary school pupils in Nigeria was 17%. Those residing in urban areas had a pass rate of 26.2% compared to those in rural areas with a pass rate of 9%, a difference of 17.2%. Likewise, the national pass rate for numeracy was 31%, with a rate of 44.9% in urban areas and 19.4% in rural areas, showing a gap of 25.5 percentage points between urban and rural students.

This pre-existing rural-urban gap was aggravated with the shift to remote learning in response to the pandemic. Many students in rural areas faced significant challenges due to poor internet connectivity, lack of access to devices, and a limited or non-existent electricity supply. These factors have compounded the existing disparities in educational outcomes between rural and urban areas, with rural students at a greater disadvantage (Olanrewaju et al., 2021).

In the context of the issues outlined above, this study focuses on the impact of COVID-19 and associated policy measures on educational inequality in Nigeria at the primary education level. Primary education is a critical indicator of the impact of educational inequalities on students as it forms the bedrock of their development. At this stage of schooling, children learn personal and professional foundational skills that prepare them for life, work, and active citizenship. Hence, analysing the effects of

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<sup>1</sup> The assessment was based on the respondents' ability to read a short simple statement about everyday life.

COVID-19 and related policy measures on access to primary schooling provides critical insights into understanding widening educational inequalities and the subsequent impact on achieving the 2030 Agenda.

In addition to examining pandemic-related effects on primary school education, this study also provides broader policy recommendations for addressing inequalities in primary education efficiently and effectively, and engaging in meaningful reform to work towards the SDG targets. More importantly, this study also responds to a gap in research on the impacts of the pandemic at the primary level, specifically in relation to the widening of inequalities, and progress towards achieving the SDG targets. While Adeniran et al. (2022) investigated learning loss at the primary level in Abuja, the study focused only on private schools. Moreover, while the study found evidence supporting the existence of COVID-19-induced learning loss, it provided little evidence of what could be done to minimise learning loss in future occurrences, as the study only focused on students' performance in low-cost private schools.

Against this backdrop, this study seeks to address the following four objectives: (i) to outline the state and dimensions of educational inequalities in Nigeria before the pandemic, (ii) to understand how COVID-19 has impacted student learning performance, (iii) to evaluate education-related pandemic measures and their impact on educational inequalities, and (iv) to provide policy recommendations regarding how existing policy responses can be improved to reduce educational inequalities.

To meet these objectives, we used both quantitative and qualitative research methods. The quantitative approach involved calculating educational inequality and school enrolment using national data, and estimating student learning outcomes based on standardised exams from two states. The qualitative approach included interviews and focus group discussions (FGDs) with participants at both local and national levels. We used quantitative methods for the first two study objectives and qualitative methods for the third and fourth. The study findings shed light on how the pandemic impacted Nigeria's education system, including student learning habits and access to educational opportunities.

## Nigerian education ecosystem

In the Nigerian constitution, education is on the concurrent legislative list of the federal government,<sup>2</sup> meaning that education is handled by the federal and state governments (Nigeria Constitution as amended, 2011). In this regard, education is free and compulsory at the primary level in Nigeria, as per the Compulsory, Free Universal Basic Education Act 2004 (UBE Act).<sup>3</sup>

Following the introduction of the UBE Act, the primary school gross enrolment rate rose to 101.4% in 2005, from a previous rate of 96.4% in 2001 (World Bank, 2022a). In 2017, however, the figure dropped to 79.08 percent, increasing slightly to 87.5% in 2018 (World Bank, 2022a). These data suggest that the improvement in the enrolment rate associated with the passing of the UBE Act was short lived. Insecurity in the form of kidnapping and banditry in the country over the last decade, coupled with cultural norms and parental disposition towards education, contributed to the decline in enrolment levels (IIEP-UNESCO & World Bank, 2021), thus exacerbating educational inequalities in Nigeria.<sup>4</sup>

In 2018, Nigeria's Human Capital Index was 0.35, which ranks lower than many other African countries, including South Africa (0.42), Zimbabwe (0.42), Togo (0.42), Namibia (0.45), Ghana (0.42), Kenya (0.54), Uganda (0.38) and Tanzania (0.39) (World Bank, 2020), implying a low level of human capital development. It is estimated that on average, children born in the country fulfil less than 40% of their productivity (World Bank, 2020). Nigeria's low level of human capital is partly associated with the number of out-of-school children (World Bank, 2022c). UNESCO and World Bank estimates show that over 10 million school-aged students in Nigeria are not in school. The dropout rate is about

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2 Part 2: Concurrent Legislative List Extent of Federal and State Legislative Powers, section 30 states that "Nothing in the preceding paragraphs of this item shall be construed to limit the powers of a House of Assembly to make laws for the State concerning technical, vocational, post-primary, primary or other forms of education, including the establishment of institutions for the pursuit of such education". This section of the constitution indicates that both the federal government and the state governments have responsibilities for legislating policies that would improve the educational sector.

3 However, due to concerns about the quality and the limited number of government-owned schools, private primary schools co-exist with government schools in Nigeria. As of 2018, about 80.2% of primary school-aged students attended government schools and the remaining 19.8% attended private schools (IIEP-UNESCO & World Bank, 2021). Further, the proportion of students attending private primary schools is 30.2 in urban areas and 13.8 in rural areas.

4 Insecurity and cultural norms that undermine school attendance are not widespread in all parts of the country; yet educational enrolment is lower in areas where these factors are predominant, such as the northern region, while in the south, where insecurity is low and cultural norms support education, enrolment is higher.

7.4%, with significant variation across regions and between age groups (IIPe-UNESCO, 2021). For example, the dropout rate is higher for those aged 12-17 years than those aged 5-11 years. Further, the dropout rate in rural areas is twice the rate in urban areas (IIPe-UNESCO, 2021).

Ensuring access to quality primary education is crucial in building human capital and enhancing economic competitiveness (Evans & Hare, 2021). However, despite the provision of free and compulsory primary education in Nigeria, not all primary school-aged children have access to education, due to a range of demand and supply factors. Demand factors include socio-cultural norms and child labour (when school-aged children engage in activities like hawking and farm work to support the family), while supply factors comprise distance to school, absence of learning support infrastructure, and heightened insecurity arising from kidnapping (World Bank, 2022c; International Labour Organization, 2022).

These factors were compounded by the COVID-19 pandemic as learning on school premises was interrupted and replaced with remote learning (Azubuike et al., 2021), and an increasing number of school-aged children engaged in child labour to supplement household income, thereby reducing their learning time. This suggests that many children, especially those from low-income households, had little or no time to learn during the pandemic's peak. Moreover, children from families that could not afford the necessary facilities or infrastructure for remote learning had few or no learning opportunities. As a result, the COVID-19 pandemic, and government measures taken in response, intensified and exacerbated existing educational inequalities and created new ones, putting primary school children from less-educated and low-income households living in rural areas at an even greater risk of being excluded from schools (Hossain, 2021).

## **Education inequality and the effect of COVID-19 on education performance in Nigeria**

When the COVID-19 pandemic hit Nigeria, the government decided to close schools from March 2020-October 2020 to curb the spread of the virus (Federal Ministry of Education, 2021). While the closure of schools was necessary to curtail the spread of COVID-19, it also perpetuated and widened inequalities in education (Ossai, 2021). The Federal Ministry of Education noted that the pandemic put additional pressure on an already ailing education system, in which there were now more than 10 million out-of-school children (Federal Ministry of Education, 2020). This phenomenon is expected to leave long-lasting effects on students, such as learning loss in children, especially those from disadvantaged and underserved communities (Federal Ministry of Education, 2020).

Learning loss is a critical issue that has emerged as a result of the COVID-19 pandemic, as students faced significant disruptions in their education. Learning loss refers to a decline in students' average performance, and it also has a learning gap dimension when evaluated in the context of performance between groups (Patrinos et al., 2022). In their evaluation of 36 studies covering developed and developing countries, Patrinos et al. (2022) show that COVID-19 resulted in learning loss ranging from 0.12 to 0.25 standard deviation, meaning an average of about 0.17 standard deviation, and more than half a school year of learning loss. However, a large proportion of the studies included in that review focused on high-income countries, with few focusing on developing countries like Nigeria. Therefore, more evidence from developing countries is needed to better understand the relationship between income levels and the effect of the pandemic on learning loss.

Previous studies on COVID-19 and educational inequalities in Nigeria and elsewhere have highlighted the relevance of the wealth and literacy levels of parents as to whether school-aged children would participate in learning at the peak of the pandemic (Azubuike et al., 2021; Hossain, 2021). For example, Azubuike et al. (2021) used data collected between April and May 2020 from around 1900 stakeholders in Nigerian educational institutions—including government officials, teachers, private organisations, parents and teachers—to understand students' access to digital learning tools and their ability to learn effectively during the pandemic. They found that about a third of the students (i.e. 30%) were not academically engaged during the lockdown, with 71% of the unengaged students attending government schools, and the remaining 29% attending private schools. These unengaged students mentioned unreliable electricity and lack of internet access as the two leading barriers to their participation in learning during school closures at the peak of the lockdown.

Education at the primary school level is largely inadequate due to poor staffing and inadequate learning facilities in government-owned schools (Hayab et al., 2023). As a result, educated and wealthy parents have increasingly sent their children to private schools, which account for 13.8% of all primary school students in Nigeria, with the share being higher in urban areas (30.2%) (IPEE-UNESCO, 2021, p. 69).

Moreover, the pandemic has further widened the gap between rural and urban areas in terms of access to quality education, as most learners in rural areas (86.2%) attend government primary schools, which are underfunded and have inadequate learning facilities compared to private schools in urban areas (IPEE-UNESCO, 2021, p. 69).

In another study, Azubuike et al. (2021) report that students who attend public schools are less likely to engage in remote learning because the digital infrastructure



and the accompanying proficiency in utilising it are largely lacking in public schools. Their findings have two implications for the field of educational inequalities and COVID-19. First, the pandemic exacerbated the educational gap between private and government schools. Azubuike et al. (2021) show that 71% of the students who were unable to access remote learning during the pandemic attended a government school. Second, their results suggest that the existence of a digital divide between students in urban areas and rural areas, private and public schools, and children from rich and poor households, reinforces how socio-economic inequalities contribute to inequality in education. The digital divide will likely exacerbate the disparity in skills on graduation, affecting future employment prospects and earnings (Azubuike et al., 2021).

At the height of the school closures, the Federal Ministry of Education collected survey data on issues about the initial closure of schools and readiness to open (Federal Ministry of Education, 2020). A total of 7403 educational stakeholders, comprising parents, teachers, students, and education managers, participated in the study. It was reported that at the onset of the pandemic, 89% of the study participants supported the decision of the government to close schools. However, over half of the respondents said the schools should reopen after a few months due to the observed setbacks associated with remote learning, such as poor or no internet connectivity, expensive data bundles, and often a total absence of learning.

A study by Lain and Vishwanath (2022) found that the COVID-19 pandemic had a significant impact on human capital accumulation in Nigeria, with Nigerian children losing over a quarter of learning-adjusted years of schooling due to the pandemic. One of the key findings was that students from poorer households had less access to learning resources such as radios, TVs, computers, or smartphones, and so had limited opportunities to learn remotely, compared to their counterparts from wealthier households. Critically, the study finds that the pandemic, and government measures implemented in response, have intensified existing educational inequalities in Nigeria, with students from poorer households disproportionately affected by heightened learning losses.

Hossain (2021) found that high-income countries adopted more advanced remote learning techniques than low-income countries. In low- and middle-income countries, including Nigeria, the use of radio and TV was more common than the digital remote learning approaches adopted in high-income countries. As the pandemic also widened the digital divide, this in turn worsened educational inequalities, particularly for students from poorer households who had limited access to digital-based remote learning. Eze et al. (2021) conducted a study on the impact of COVID-19 on education in Nigeria using a sequential, exploratory, mixed-method approach, including a total sample of 5,552 participants, selected using multi-stage sampling techniques. The study revealed that

COVID-19 exacerbated educational challenges in Nigeria, such as underperformance, increased urban-rural disparities, and technology access issues. The pandemic notably impacted school enrolment, heightened academic achievement disparities, and increased educational inequality.

As more research emerges on the impact of pandemics on education, policymakers will gain a better understanding of how to address these challenges, while minimising the negative impact on students' learning. Thus, this study aims to contribute to understandings of how Nigeria's educational system has responded to the pandemic's effect, and of measures taken by the government to mitigate the resulting educational inequalities.

## Gaps in the literature

Several studies have looked at educational inequalities and the impact of the COVID-19 pandemic on education in Nigeria, and other parts of the world. However, a noticeable gap is that these issues have mainly been studied separately, and little work has been done to evaluate changes in educational inequalities in Nigeria due to the COVID-19 pandemic. Adeniran et al. (2022), for instance, focus only on learning loss associated with COVID-19, using data from low-cost private schools in Nigeria, with impacts on learning loss in public schools and high-cost private schools not considered. Similarly, Lain and Vishwanath (2022) examined the impact of the pandemic on human capital accumulation in Nigeria, using data from the Nigeria COVID-19 National Longitudinal Phone Survey. However, they relied only on descriptive analysis, which may raise questions about the accuracy of responses and objectiveness of findings. Also, Azubuike et al. (2021) explore learning inequality in Nigeria, but focus only on the digital divide specifically within the pandemic period.

The current study, therefore, fills the gaps identified first, by approaching the effects of COVID-19 from the perspective of educational inequalities. It does this not only by exploring the subject of educational inequalities as a pre-existing problem in the Nigerian education system and considering the effect of COVID-19 on these inequalities, but also by looking beyond digital divides to consider factors underlying different dimensions of learning inequality, such as gender, economic status, and geographical location. This allows the study to explore in greater detail changes in learning inequalities in Nigeria relating to the disruptions caused by COVID-19.

Second, the study adopts a quantitative regression-based approach, supplemented by qualitative analysis based on insights from interviews and FGDs, which helps to control for biases that are often a limitation of using a single approach.

Third, the study focuses on primary/basic level education (which is a core part of the global agenda for education in the SDGs), thus adding to the growing literature on this education level. The study also builds on Adeniran et al. (2022) to include both public and private schools in urban and rural settings. It leverages a more robust analysis to provide stronger evidence and recommendations on how learning loss and inequalities can be minimised in possible future disruptions.

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## Methodology and data

### Methodology

The study sought to produce data on: (i) educational attainment (share of school-age children in school), and (ii) student learning performance (measured by proficiency in numeracy and literacy);<sup>5</sup> and then to (iii) evaluate education-related pandemic measures and their impact on educational inequalities, and (iv) provide policy recommendations aimed at reducing educational inequalities.

Qualitative analysis is based on interviews and FGDs, while the Gini index of educational attainment and student assessment records are used as the basis of the quantitative analysis to develop a regression model. Instead of relying solely on verbal feedback from students, parents, etc., which, though useful, is a one-dimensional approach, our method allows for interaction between the variables in question, thereby establishing a more nuanced understanding of plausible factors related to educational inequalities and the decline in enrolment rates.

### Data

As noted above, the questions posed in this study require a mixed quantitative and qualitative research design. In terms of quantitative data, the study uses two main datasets: the World Bank Living Standards Measurement Study<sup>6</sup> (LSMS) data and students' academic records for primary education at the termination level from the national examination body. Given the focus here on educational inequality, LSMS data

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<sup>5</sup> In the study, we focused mainly on the cognitive measure of students' learning performance.

<sup>6</sup> The study was conducted with a similar theme in two other African countries. Using LSMS is therefore a useful benchmark. Also, LSMS is the most recent survey that contains information on education attainment for children.

helped ascertain the share of school-aged children that have commenced primary education. Figures were compared across geographical location, socio-economic status, and gender. Data on education from Nigeria's COVID-19 National Longitudinal phone survey (2020-2021)<sup>7</sup> complemented the LSMS data and showed changes in student enrolment during the different phases of the pandemic, or school closure and reopening. In addition, students' academic records were used to ascertain learning outcomes before and after the height of the pandemic.

Furthermore, this study assesses educational inequalities between school-aged children from poor and non-poor households, using household expenditure to classify households based on the LSMS data. However, we recognise the caveat that using household expenditure as a determinant of status does not entirely capture the income levels of households, as many other factors, such as consumer expectations, taste and preferences, and interest rates, can influence patterns of household spending.

Qualitative data were collected through 16 FGDs and 20 key informant interviews (KIs). Eight FGDs, half with teachers and half with parents from public and private schools, were conducted in each state, with each group consisting of six participants. KIs included interviews with representatives from the Federal Ministry of Education and the Universal Basic Education Commission at the national level, and six individuals from the State Universal Basic Board and the Ministry of Education at the state level. All interviewees had over ten years of experience in the education sector. Two civil society actors in each state, as well as representatives from four EdTech companies, were also interviewed to provide diverse insights into the effects of COVID-19 on the education sector disparities, and possible mitigation strategies for the future.

The selection of study participants combined purposive sampling and random selection. Four groups of participants—teachers, parents, government officials, and EdTech representatives—were drawn from both urban and rural areas, to allow for geographical differences. School administrators recommended teacher and parent participants from randomly selected schools. Government officials involved in the educational response to COVID-19 were recommended by the education ministry at national and sub-national levels. The participating EdTech companies were randomly selected.

The quantitative component of the study was carried out first, so that emerging findings could be used to frame the FGDs and interview questions. As a result, the qualitative component serves two purposes: to triangulate evidence obtained from

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<sup>7</sup> Nigeria's COVID-19 National Longitudinal phone survey is an open-source data set collected by the National Bureau of Statistics in collaboration with the World Bank, which includes questions on education.

the quantitative analysis, and to provide opportunities for the different stakeholders to share—in detail and with candour—their experiences and perspectives on the disruption to the education system in 2020, and how the government may have addressed the challenges in a way that minimised the impact on learning.

The study focuses on two states in Nigeria: Oyo and Jigawa States. Oyo State is in the south of Nigeria, and Jigawa State is in the north. In 2018, 54% of primary school students in Oyo attended private schools, whereas the figure for Jigawa was only 13% (IIEP-UNESCO & World Bank, 2021), indicating that a larger proportion of primary school-aged students in Oyo State attended private schools compared to Jigawa State. Oyo is more urbanised than Jigawa, and the higher prevalence of students attending private schools in Oyo could be associated with demand, in terms of cultural factors favouring the prioritisation of education, and a greater ability to afford private schools, together with supply issues in terms of private sector involvement in delivering educational services, and more notable ability to afford private schools in Oyo State than in Jigawa State.



**The digital divide will likely exacerbate the disparity in skills on graduation, affecting future employment prospects and earnings.**

The approach used in the study had two main limitations. First, student records were at the individual level and lacked information about students' household characteristics, school type and location. Consequently, the regression model had a limited number of control variables, and vital information such as school type and family background were not controlled for, but proxied using state-level data. Second, a limited number of states were covered in the study. Future research should consider increasing the number of states to about a quarter of the states in the federation to produce a more holistic overview of the situation in Nigeria.

## Data analysis

To calculate educational inequalities and estimate the impact of the pandemic on student learning behaviours—in line with objectives 1 and 2—different quantitative data were required. First, Nigeria's most recent LSMS data (2019) regarding educational attainment were used. Since the focus is on primary education, LSMS data used

corresponded to the age group 6-13 years,<sup>8</sup> giving a total sample size of 6,696 school-aged students.<sup>9</sup>

To understand the extent of educational inequalities among primary school-aged children, the Gini index of education attainment is used to measure educational inequality across gender, geographical location, and income level.<sup>10</sup> Specifically, this study adopts the educational inequality framework developed by Thomas et al. (2001), which helps to estimate and understand the level of educational inequality in Nigeria. The method was also used to measure educational inequality in China by Banzragch et al. (2019), and in Mongolia by Yang, Huang, and Liu (2014). The Gini coefficient is calculated as follows:

$$Gini = \frac{1}{\mu} \sum_{i=2}^n \sum_{j=1}^{i-1} p_i |y_i - y_j| p_j \quad (1)$$

where  $\mu$  is the average years of schooling for primary school-aged students,  $p_i$  and  $p_j$  measure the proportions of the population with certain levels of schooling,  $y_i$  and  $y_j$  measure years of schooling at the different educational attainment levels, and  $n$  is the number of attainment levels. In this study we use five levels: no education, primary 1, primary 3, primary 5, and completed primary school.

Eqn. (1) would be estimated along the different dimensions, which are gender, geographical location, and income levels. This process helps ascertain the state and the dimension of educational inequality in Nigeria. In other words, the level or magnitude of inequalities as observed from selected indicators, and the ways in which these inequalities manifest, for example between different genders or income groups. After estimation, the Gini coefficient ranges determine the extent of educational inequality.

Furthermore, to calculate the impact of the pandemic on students' learning performance, this study uses regression analysis to compare student performance after the school closure period to that recorded before the closure. Specifically, it employs a regression approach. The model to be estimated is presented in Eqn. (2) as follows:

$$y_{ist} = \alpha + \beta_1 COVID + \varepsilon_{ij} \quad (2)$$

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8 In Nigeria, children are expected to start primary school at the age of six.

9 The number was arrived at after cleaning the data. The analysis only focused on school-aged students within the age bracket, thereby eliminating the issue of missing observations.

10 The analysis of educational inequality focused on the national level. However, we were able to extract the value at the state level, in the same way as the gender level or geographical location.

where  $y_{ist}$  is the measured standardised score for student  $i$  in school  $s$  at assessment point  $t$ , COVID is a dummy variable indicating the COVID-19 period, and  $\varepsilon_{ij}$  is an independent and identically distributed error term.

Given the focus of the study, primary school students' test scores from their graduating year were used to measure  $y_{ist}$ . National Common Entrance Examination (NCEE) results were used as test scores for the study. The exam questions are standardised and nationally coordinated by the National Examination Council (NECO). Students sit the exam in graduating class in primary school, before transiting from primary school to junior secondary school. The assessment shows student performance, as well as disaggregated scores in mathematics and English. This study used students' scores in English and mathematics to enable regional comparison and to aid comparison with existing literature that uses numeracy and literacy performance.

Additionally, the study used four years (2017–2021) of primary school graduates' academic records,<sup>11</sup> divided into three groups. Academic performance data used corresponds to the two academic years prior to the pandemic (2016–2017 and 2018–19), the academic year disrupted by the pandemic (2019–2020), and the academic year following the reopening of the schools (2020–2021).<sup>12</sup>

In Eqn 2, COVID takes a value of 1 for periods after the schools were closed and 0 for periods before the school closure, thereby representing COVID-19 periods. The variable is crucial for determining variations in student performance before and after school closures. A negative coefficient would imply that the students perform better in academic sessions after school closures, a positive would imply the opposite, and an insignificant association would imply that student learning was unaffected by school closures.

Based on the study aim, which is to evaluate the impact of COVID-19 on student learning in Nigeria,  $\beta_1$  in Eqn (2) is the parameter of primary interest. A negative and significant coefficient for  $\beta_1$  indicates a decline in student performance because of the closure of schools.

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11 NECO conducts the exam and has records of students' results. The data were received from the Council after a clearance from the sampled states.

12 Since there might be a decline in exam difficulty in COVID-19 academic session, the coefficient obtained in the study should be interpreted with caution. However, we are certain that variation in the difficulty of the exam over time is less likely to alter the study's overall results.

The remaining two objectives of the study—the evaluation of education-related pandemic measures and their impact on educational inequalities, and the provision of policy recommendations aimed at reducing educational inequalities—were answered through a qualitative research framework. The data were collected through FGDs and KIs and analysed through a thematic approach for these two objectives. Thematic analysis entails drawing patterns and making inferences from the responses of the study participants to questions they were asked.

## Findings

### The state and dimensions of educational inequalities in Nigeria

The Gini coefficient index of educational attainment was adopted to measure educational inequality. The Gini index ranges between 0 and 1, where 0 indicates equality in education, and 1 indicates a high degree of educational inequality. Results shown in Table 1 indicate that at a national level, the index is estimated at 0.393, which is high compared to the global average of 0.22, and higher than, for example Ghana, at 0.372 (Ziesemer, 2022; Afoakwa et al., 2022). The estimates indicate that despite the introduction of free primary education in Nigeria, inequality in educational attainment among school-aged children persists. The data suggest that inequality in educational attainment is primarily due to location and income level, with no significant difference at the gender level (see Table 1).

In terms of geographical location, the Gini index for urban areas is 0.296, compared to 0.424 for rural areas, meaning the index in rural areas is about a third (0.128) higher than in urban areas. Nigeria has 36 federated states grouped into six zones. States in the north had a Gini index greater than 0.3, while states in the south had an average score of 0.27. The northeast had the highest overall score of 0.498, followed by the northwest at 0.428, and the north central at 0.379. The Gini index for the southwest region was the lowest at 0.273. The results of the Gini index according to geographical region indicate that as well as high levels of educational inequality in rural areas, there are also significant educational inequalities by region, affecting particularly the northern part of the country.

At the state level, Gini index data for Jigawa and Oyo States are also presented in Table 1, and show that education inequality is much more pronounced in Jigawa (0.404) than Oyo State (0.376). It is notable both that Jigawa State had a Gini index higher than the national average of 0.393, and that the index for Oyo State was lower than the national average, suggesting that educational inequality is especially pronounced in Jigawa.



Similarly, the figure for average years of schooling in Oyo State (5.3 years) is higher than that of Jigawa (4.1 years) by over one year. Overall, and in line with Thomas et al. (2001), findings show that the Gini index value is inversely related to years of schooling. Moreover, this study investigated the magnitude of educational inequality between school-aged children from poor and non-poor households, using household expenditure to classify households into poor and non-poor. As shown in Table 1, there is a notable difference between the Gini index of poor households (0.485) and non-poor households (0.329), suggesting that there is a relationship between household income and educational inequality.

Similarly, the average years of schooling of school-aged children from non-poor households is 5.5 years, which is 1.7 points higher than the 3.8 years recorded for poor households. As shown in Table 1, the Gini index of educational attainment for males is 0.385 while that of females is 0.4, suggesting that boys were marginally more likely to be educated than girls. However, the margin is very slim, suggesting that gender is not a significant factor in explaining inequality in educational attainment in Nigeria.

Table 1. Educational inequalities in Nigeria, 2018–2019

Variables	Indicators	Gini index	Years in school	No. observation
National	—	0.3926	4.842	6696
Gender	Male	0.3853	4.858	3489
	Female	0.4004	4.824	3207
Location	Urban	0.2957	6.046	1708
	Rural	0.4236	4.430	4988
State	Oyo	0.3757	5.27	74
	Jigawa	0.4039	4.112	250
Geopolitical zone	North central	0.3789	4.929	1111
	Northeast	0.4988	3.852	1657
	Northwest	0.4281	4.155	1803
	Southeast	0.2797	5.634	656
	South-south	0.2737	6.381	827
	Southwest	0.2728	6.386	642

Wealth	Poor	0.4852	3.832	2682
	Non-poor	0.3285	5.517	4014

Note. Adapted from *Living Standards Survey 2018-2019* by the World Bank (2021a).

To understand the dynamics of school enrolment after the reopening of schools following the 6-month shutdown during the pandemic, we analysed the COVID-19 National Longitudinal phone survey. The survey was collected over 12 rounds, with information on education at an individual level collected in October 2020 and March 2021. Figure 1 shows information about student enrolment rate before COVID-19 and when schools were reopened. The results show that not all students had returned to school 5 months after schools were reopened. The extent to which students returned to school largely depended on gender, geographical location, and income status.

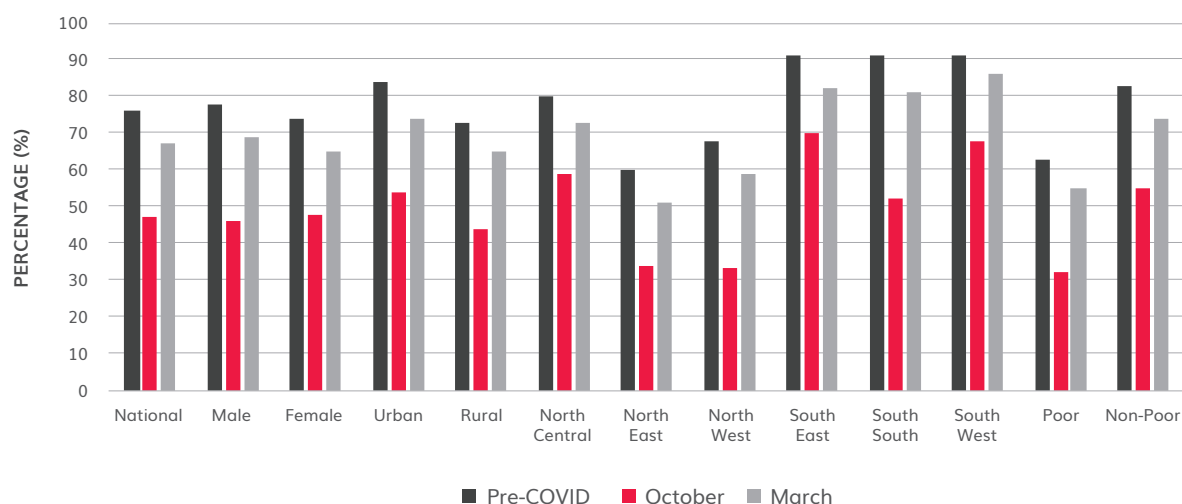
Pre-COVID, about 75.9% of school-aged students were enrolled in schools, a figure which had dropped to 46.6% in October 2020 when schools were first reopened, and had increased to 67.1% by March 2021. Before the pandemic, the enrolment rate for males was 77.3%, and for females 74.4%. In October 2020, male enrolment stood at 45.9%, which increased to 68.6% in March 2021, giving a dropout rate of 8.8 percentage points. For female students, enrolment dropped to 47.4% in October 2020 and then rose to 65.4% in March 2021, giving a dropout rate of 8.9 percentage points.

Furthermore, data in Figure 1 show that during the pre-pandemic period, the enrolment rate in urban areas (84.4%) was higher than in rural areas (72.9%) by 11.5%. When schools reopened in October 2020, urban areas recorded a 53.9% enrolment rate, compared to 44.0% in rural areas. In March 2021, about 5 months after schools were reopened, the enrolment rate increased to 73.9% for urban areas and 64.7% for rural areas. Because rural areas had a lower enrolment rate before the pandemic, the impact was less than in urban areas, where more students attended schools before the pandemic.

Greater school attendance in urban areas meant that the effect on attendance would be greater than in rural areas. Consequently, the enrolment gap between rural and urban areas narrowed from 11.5% pre-pandemic to 9.2% post-pandemic.

 **Despite the introduction of free primary education in Nigeria, inequality in educational attainment among school-aged children persists.**

Figure 1. Share of children enrolled in school pre-COVID-19 through to March 2021



Note. Adapted from Nigeria's COVID-19 National Longitudinal Phone Survey 2020-2021 by the World Bank (2021b).

Teachers reported initial parental reluctance to send children back to school due to COVID-19 fears. The implementation of safety protocols alleviated these fears, leading to increased enrolment by March 2021 compared to October 2020, in both urban and rural areas. However, full school return has not been achieved, implying persistent pandemic-related impacts on human capital development, in the absence of specific interventions. Increased numbers of out-of-school children, lacking essential numeracy and literacy skills, impedes economic development and workforce integration.

In addition, this study investigated enrolment based on students' family background, specifically economic status. Average annual household expenditure was used to categorise a household as either poor or non-poor. As shown in Figure 1—in a trend similar to the average years of schooling shown in Table 1—83.1% of children from non-poor households were enrolled in school prior to the pandemic, over 50% when schools were reopened in October 2020, and 73.5% in March 2021, giving a dropout rate for non-poor households of 9.6%. The enrolment rate for children of poor households was 62.8% prior to the pandemic, falling to 31.6% in October 2020, and rising to 55.4% in March 2021, giving a dropout rate of 7%. The lower dropout rate of children from poor households relative to non-poor households is mainly due to the higher rate of enrolment among non-poor households before the pandemic.

## Effects of COVID-19 on student performance

Using a nationwide primary school assessment test for two states in Nigeria (Oyo and Jigawa) this section explores the effects of COVID-19, and the measures imposed in response to the pandemic, on student performance in the two states.

Students' scores recorded during the pandemic in 2020<sup>13</sup> were compared to two previous academic sessions (2016–2017 and 2018–2019). The test took place when schools reopened in October 2020. The examination is usually scheduled for May, but the closure of schools led to its postponement until October.

As noted in Table 2, the results show a decline in student performance in the COVID-19 year of 9.9% relative to the 2016–2017 and 2018–2019 academic sessions. The subjects evaluated are mathematics and English which, when taken separately, show a sharper decline in performance in mathematics (11.1%) than English (8.9%).

To better understand the context and try to explain this fall in performance, teachers and parents were asked about whether formal learning occurred after the announcement of school closures in March 2020. In all the FGDs, parents and teachers reported that minimal education activities took place when schools were closed, especially in government schools. However, in some private schools digital learning—primarily through WhatsApp—was introduced to sustain student learning. Teachers mentioned a lack of study time, a decrease in the desire to learn as a result of the prolonged school closures, poor nutrition (linked to the economic impacts of the pandemic affecting household spending power), and a lack of guidance from their teachers as the most likely causes of the decline in performance.

The government launched radio and TV 'on-air programmes' as alternative learning platforms during school closures. However, these platforms had limitations including the lack of real-time student-teacher interaction, inconsistent electricity, and parents' unpreparedness to substitute teachers. These challenges were heightened in poorer, rural households with limited access to electricity and learning tools.

Upon school reopening, teachers observed a temporary decline in students' engagement, class participation, and attendance. To combat this, teachers adapted their methods, engaging in one-on-one coaching to revive student interest. Class attendance remained around 20% below pre-pandemic levels, which was attributed to parents'

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13 The test took place shortly after the schools were reopened in October 2020. See <https://punchng.com/breaking-2020-common-entrance-exams-hold-oct-17-fg/>

economic struggles affecting their ability to afford school fees, and ongoing COVID-19 safety concerns.

While schools were closed, educated parents or older siblings often filled the teaching gap, and some families hired tutors. However, these measures could not fully replace the classroom experience, leading to reduced learning performance.

Table 2. Impact of COVID-19 on student learning

	1	2	3	4	5	6	7	8	9
	All	English	Maths	All	English	Maths	All	English	Maths
CovidYr	-4.49 (0.369)***	-4.21 (0.541)***	-4.91 (0.524)***	-4.91 (0.530)***	-3.99 (0.777)***	-5.82 (0.752)***	0.50 0.904	-4.03 (1.321)***	7.09 (1.275)***
Female (=1)				1.80 (0.414)***	2.54 (0.643)***	1.36 (0.621)**			
COVIDYrxFemale				0.82 (0.738)	-0.43 (1.08)	1.75 (1.046)*			
Oyo (=1)							20.75 (0.546)***	20.48 (0.856)***	23.41 (0.816)***
COVIDYrxOyo							-5.89 (0.978)***	-0.12 (1.428)	-14.09 (1.379)***
Constant	45.51 (0.207)***	47.07 (0.322)***	44.09 (0.311)***	44.59 (0.296)***	45.76 (0.462)***	43.39 (0.446)***	27.82 (0.504)***	29.50 (0.793)***	24.11 (0.753)***
Observations	12384	5502	5522	12384	5502	5522	12384	5502	5522
R-squared	0.0118	0.0109	0.0157	0.0147	0.0147	0.019	0.136	0.1487	0.153

Notes. COVIDYr denotes COVID-19 year, which is 2020. \*significant at 10%;  
\*\*significant at 5%; \*\*\*significant at 1%.

Adapted from *National Common Entrance Examination results* by the National Examination Council (2017, 2018, 2019, 2021).


Regarding the relationship between learning loss and gender, the results in columns 4–6 of Table 2 show that the performances of girls and boys were affected equally by the pandemic. The positive coefficients for female indicate that girls outperformed boys, and it is statistically significant at 1%. Additionally, the findings in column 4 of Table 2 indicate that learning loss increased when accounting for gender, which raises the possibility of gender differences in learning loss. Indeed, data consistently shows that girls outperform boys. However, the gap in learning performance was lower when schools reopened,

based on the negative coefficient of the interaction term. These results motivated us to ask teachers and parents whether they observed differences in attitudes to learning among boys and girls.

In the FGDs with parents, participants reported that boys and girls were given similar support during the school lockdown, but that when schools were closed, their children spent more time playing, resulting in less reading time. Boys were reported to have more play time than girls, who spent more time reading during the pandemic than their male counterparts. Parents and teachers reported that boys and girls show some differences in their pursuit of learning. For example, one of the teachers noted that male students were more distracted than females, and the school closures allowed

the male child to engage in non-learning-related activities. The reopening of schools reduces time for play and puts the male children in a position to learn. Teachers also reported that their female pupils showed more interest in learning, answering questions in class, completing assignments, and coming early to class. These findings, therefore, reinforce pre-existing differences in student performance by gender, in line with evidence in Adeniran et al. (2020). Using the 2015 National Education Data Survey for students in Primary 1 and 2, Adeniran et al. (2020) show that girls performed better in both numeracy (31.8%) and literacy (17.4%), than boys who scored 29.3% and 16.8% respectively.

Furthermore, when taking location into account, the results in columns 7–9 of Table 2 show a decline in student academic performance due to COVID-19. Specifically, we analysed how COVID-19 impacted student performance in the sampled states. We observed that student performance in Oyo is higher than in Jigawa, which is consistent with the evidence in the Multiple Indicator Cluster Survey (National Bureau of Statistics & United Nations Children's Fund, 2022). Oyo was more affected by the pandemic than Jigawa, and the impact on literacy (English) was more pronounced than on numeracy (mathematics).<sup>14</sup>



**Learning should take place anywhere, and one of the ways that this can be done is through technology.**

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<sup>14</sup> Oyo State is more urbanised than Jigawa.

In Table 3, we augmented the initial model to include 2021, which is the academic session when schools reopened, extending the data set to 2021, and including a variable in the model to capture 2021 (post-COVIDyr1). The added variable is a binary, assigned 1 for students' scores in 2021 and 0 for preceding years. As shown in Table 2, the coefficient of the parameter is positive and significant, indicating that students recorded an improvement in learning performance. Because the coefficient for the year that schools were reopened was slightly lower than that of the COVID-19 year in absolute terms, it implies that there was marginal improvement in learning.

Class attendance increased with an improvement in the economy, the implementation of the COVID-19 protection protocol, and the emergence of the COVID-19 vaccine. The positive coefficient for the post-COVID parameter in Table 1 suggests an improvement in student learning performance in 2021. The performance improvement is a testament to the efforts of teachers and their contribution to students' academic performance upon the reopening of schools.

Table 3. Impact of COVID-19: A year after schools reopened

	1	2	3	4	5	6	7	8	9
	All	English	Maths	All	English	Maths	All	English	Maths
COVIDYr	-4.55 (0.387)***	-4.21 (0.557)***	-4.91 (0.532)***	-4.89 (0.556)***	-3.99 (0.801)***	-5.82 (0.764)***	1.57 (0.953)*	-4.03 (1.374)***	7.09 (1.306)***
PostCOVIDYr1	1.50 (0.437)	1.92 (0.630)	1.07 (0.602)*	2.31 (0.618)***	3.29 (0.890)***	1.30 0.852	7.43 (1.025)***	6.13 (1.474)***	8.59 (1.408)***
Female (=1)				1.95 (0.459)	2.54 (0.663)	1.36 (0.631)**			
COVIDYrx Female				0.66 (0.773)	-0.43 (1.114)	1.75 (1.063)*			
PostCOVIDYr1 xFemale				-1.54 (0.873)*	-2.64 (1.258)**	-0.41 1.202			
Oyo (=1)							22.00 (0.614)***	20.48 (0.891)***	23.41 (0.835)***
COVIDYr#Oyo							-7.14	-0.12	-14.09

							(1.031)***	1.486	(1.413)***
PostCOVIDYr1 #Oyo							-6.51	-4.41	-8.49
							(1.118)***	(1.608)***	(1.536)***
Constant	45.58	47.07	44.09	44.57	45.76	43.39	26.75	29.50	24.11
	(0.230)***	(0.332)***	(0.316)***	(0.330)***	(0.477)***	(0.453)***	(0.568)***	(0.825)***	(0.772)***
Observations	13750	6868	6882	13750	6868	6882	13750	6868	6882
R-squared	0.014	0.0129	0.0156	0.0166	0.0158	0.0183	0.1327	0.1347	0.1392

Notes. COVIDYr denotes COVID-19 year, which is 2020; PostCOVIDYr is the year after schools reopened, which is 2021. \*significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

Adapted from *National Common Entrance Examination results* by the National Examination Council (2017, 2018, 2019, 2021).

## COVID-19 education-related policy responses and their effects on educational inequalities

This section focuses on addressing the third objective of our study: "What was the efficacy of COVID-19-related policy responses in the educational sector?" We employed a qualitative approach, gathering insights through FGDs and KIIs, and conducting a thematic analysis of the collected data. The discussion explores the nature of governmental policy responses to the educational disruptions caused by the pandemic, the current state of digitalisation within the educational sector, and the sustainability of the government's initiatives aimed at mitigating the pandemic's impact on education.

### *The need for digitalisation in education*

Policy responses are a reflection of the state or condition of the educational sector before the pandemic. As schools were closed on short notice, there was a lack of time and guidance for developing practical adaptations to sustain pre-pandemic levels of enthusiasm and learning outcomes at the primary school level. Remote learning was the only option to ensure continuous learning when in-person education was impossible. However, as noted in the literature and current findings, digital infrastructures were not readily nor widely available. While the importance of effective use of digital learning in education was discussed before the pandemic, it still required much greater integration into students' learning in most government and private schools. The pandemic, therefore, has incentivised policymakers to invest in digital learning infrastructure to make the educational sector resilient to similar shocks in the future.



## Government initiatives adopted and factors considered

To facilitate remote learning, the government initiated an on-air programme using radio and TV, running courses from Monday to Friday in five main subjects: English, mathematics, basic science, technology, and social studies. Teachers delivered content while the private sector provided technical support. This solution responded to Nigeria's technological limitations, including poor internet infrastructure and technology deficiencies, especially in rural areas, by leveraging affordable and broadly accessible media. The government used its public broadcasting network and partnered with private stations, as seen in Oyo and Jigawa states, to enhance teacher availability, subject coverage, and broadcasting frequency.

Regarding affordability, on-air programmes are affordable for the target audience since radio and TV equipment are less expensive than internet-supported phones or laptops. Existing coverage was also a factor in the adoption of radio as a teaching medium during the school closures, since a far higher proportion of households own a radio (47.8%) than own a computer (9.4%), or have access to the internet at home (34.6%) (NBS & UNICEF, 2022). Furthermore, during the pandemic's peak, the government provided households in hard-to-reach communities with free radios.<sup>15</sup> While the government mainly used on-air programmes to sustain learning, some private schools adopted teaching via mobile phone apps, including WhatsApp.<sup>16</sup> However, their effectiveness was limited due to many learners lacking the necessary smart devices and internet connection.

Overall, parents assessed learning during the pandemic through the on-air programme as weak and inefficient, which some government representatives also confirmed. As one of the interviewed parents in Jigawa State noted:

"There is a possibility the pupils will not be home when it is time for the radio lessons. No means to ask questions, as it was a one-way communication. [...] Sometimes, there was no electricity."

Parents noted that the one-way communication hindered students' learning as they could not seek clarification immediately. While there were opportunities to ask questions during the programme, the sheer number of students and the cost associated with calling meant that few students sought clarification.

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15 Based on an interview with a government officer, and confirmed by civil society organisations.

16 Based on observation from interviewing teachers and parents from both private and public schools.

## *Remote learning and educational inequalities*

The on-air programmes intended to maintain learning during school closures, but inefficiencies and socio-economic disparities potentially exacerbated long-term educational inequalities. Success relied on educated adults' assistance, which was challenging given the country's 62% adult literacy rate. Thus, boosting adult literacy is crucial to support child learning.

School closures disproportionately affected poor households, reliant on on-air programmes or older siblings' teaching. In contrast, wealthy households could afford private tutors or online platforms, minimising learning disruptions. Economic pressures also forced children from disadvantaged homes to contribute to household income, widening the educational gap. These children would then need extra support on resuming schooling.

Access to on-air programmes was limited for rural residents and physically disabled students, perpetuating existing inequalities. For example, deaf students could not utilise radio learning, and radio signal coverage and equipment were only available in 22% of rural households. Pre-pandemic, urban areas had higher school enrolment rates (89%) than rural areas (61%). Hence, insufficient radio coverage in rural areas exacerbated the education access disparity between urban and rural students during the pandemic.

The inefficiencies of the on-air programme, coupled with existing socio-economic limitations and structural factors limiting infrastructure spread, combined to exacerbate educational inequalities in the medium and long term, despite the programme providing some level of continued access to learning without which inequalities in learning and educational attainment would have been worse.

## *Sustainability*

The limitations of the on-air programme implemented during the pandemic have highlighted the importance of technology in the education sector, and the pressing need for investment in Nigeria's digital infrastructure and the availability of affordable internet-enabled mobile devices. The study participants agreed about the importance of technology in education. As one of the government officials interviewed notably stated:

"There is a great need for improved technology, to have a better education service delivery because the experience we had during COVID-19 taught us that we should take learning outside the four corners of the school walls. Learning should take place anywhere, and one of the ways that this can be done is through technology."

As children resumed in-person lessons, less attention was given to the on-air programme, and possible ways to develop on-air programmes became less of a priority. This is largely because the on-air programme was adopted without prior planning and with no time to design effective responses. Furthermore, the sustainability of the initiative is threatened by low budgetary allocation to education.<sup>17</sup> However, the few gains that did emerge during school closures, especially the rise in education technology, suggest that digitalisation of learning is a crucial element of future educational planning and discussion.

## **How existing policy responses can be improved to reduce educational inequalities going forward**

This section focuses on how policy responses may be enhanced to reduce educational disparities, based on feedback gathered from KIIs and FGDs. The section presents an in-depth analysis of the pre-pandemic state of digitalisation in education and how policymakers perceive it in the future, while also highlighting the views of stakeholders. The ultimate objective is to contribute to the construction of a robust and resilient education system that promotes quality education for all, in line with SGD 4.1.

### *State of learning during the pandemic*

Policy makers' broad acceptance of on-air programmes as a strategy to sustain learning during the school shutdowns indicates how rudimentary the education technology space is in Nigeria. The choice was determined by weak digital learning tools and low use of internet-enabled phones, related in turn to underinvestment in digital infrastructure and widespread poverty. While the use of on-air programmes helped sustain learning to some degree, it did not reduce educational inequalities significantly. Parents with sufficient financial resources can employ teachers to teach their children or subscribe to online teaching platforms.

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<sup>17</sup> The production of digital content has associated costs, and government officers interviewed pointed out that without budgetary support, it might be hard to sustain.

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### *Technology and educational inequalities*

Technology may conceivably both ameliorate the effect of the pandemic on educational inequality and amplify it. All 111 participants in this study (FGDs and KIs) noted the crucial role of technology in the future of education. First, it increases access to educational materials through electronic devices. Second, it makes education global because all people can potentially access the same learning materials and learn the same content. Third, technology fosters teacher-student interaction by bringing students closer to their teachers. Hence, attention has to be shifted to ways technology can foster educational equality, especially in the medium and long term, by ensuring that no one is left behind. An approach focused on equal access to technology will reduce inequalities in education, as technology can foster educational equality when it is affordable and accessible to all, regardless of gender, socio-economic condition, or geographical location.

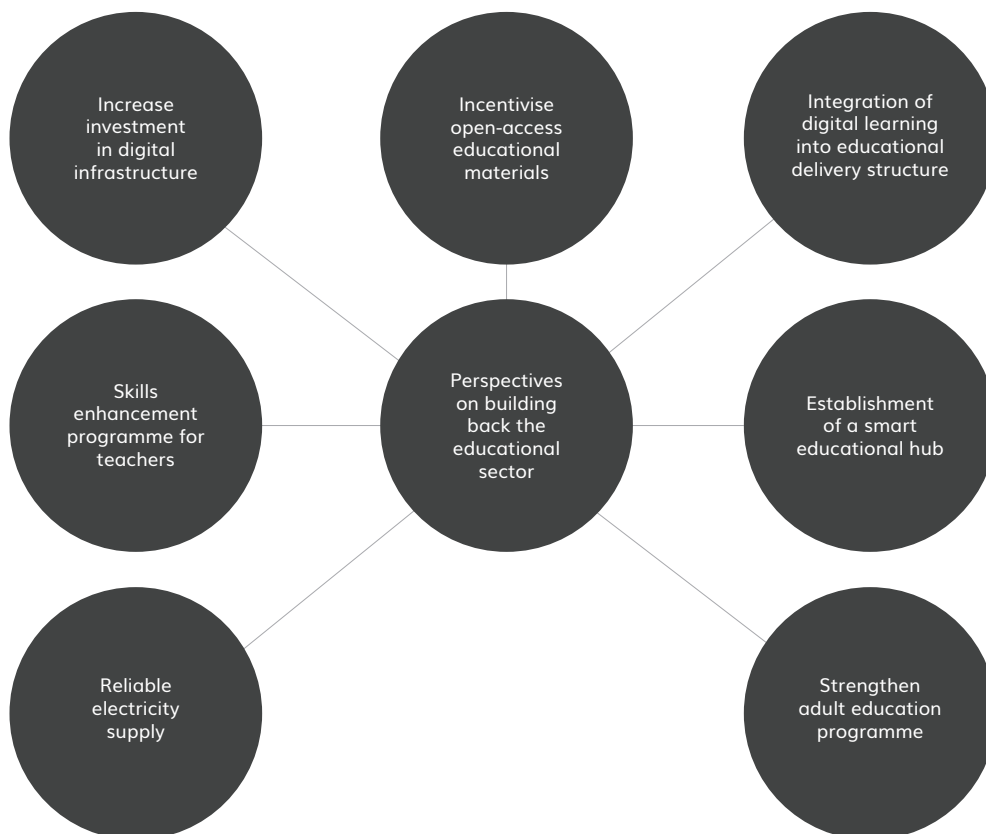
As noted in the study, unequal access to technology creates a 'digital divide' whereby affluent and privileged groups can access technology while a significant proportion of society cannot. Indeed, study participants noted that the digital divide is mainly economic, suggesting that a lack of economic power is a key barrier to people accessing technology. As an indication of progress in this area, however, study participants noted a recent increase in technological adoption, especially in learning, due to the pandemic. Hence, in preparing for a future pandemic, and indeed to reduce educational inequality more broadly, concerted efforts to provide digital learning facilities in schools are required to make technology more affordable and accessible.

### *Perspectives on building the educational sector*

As previously stated, the study aimed to document insights on how existing policy responses can be improved to reduce educational inequalities, through engaging with the perspectives of stakeholders. Stakeholders agree on the end goal being to foster educational equality and build resilience in the educational sector, but they hold diverse opinions on how this may be achieved. Seven perspectives stand out from the KIs and FGDs (see Figure 2).

1. Increase investment in digital infrastructure – increase coverage and reduce cost of the internet: A weakness in the government's policy response during the pandemic was a lack of diversity in the learning options available to students. The on-air programme (which involved radio and TV broadcasts of lessons) was highly centralised, with no opportunity for teachers to innovate with their teaching style. Study participants, especially teachers and EdTech providers, acknowledged that addressing the digital infrastructure deficit by increasing internet access and reducing its costs is critical in making digital learning affordable and widely available. Increased investment in digital infrastructure will motivate teachers to teach their students in a diversified way using digital tools. With the integration of digital learning into the education system, students would benefit from a wide array of online learning materials, which would help foster educational equality in the medium and long term.

Figure 2. Stakeholder perspectives on how to build the educational sector



Note. Elaborated by the authors based on 18 KIIs and 16 FGDs

2. Incentivise open-access educational materials – social entrepreneurs: The shortfall in the government response to sustained learning at the height of the pandemic highlighted a gap in the educational sector that social entrepreneurs could fill. Once digital infrastructures are well developed and all students can access digital learning platforms, the next step would be providing quality educational content. The study participants noted that government incentives, such as bonuses and awards, would help encourage teachers to create and publish quality educational content. The government's role would be to coordinate the content produced in a widely accessible portal. This would help ensure inclusive and equitable learning for all, without inequalities based on gender, geographical location, or socio-economic status, as targeted in SDG 4.
3. Integration of digital learning into an educational delivery structure: Across the world, the pandemic demonstrated the possibilities of digital, remote-based learning. Government officials, educators, and suppliers of teaching materials emphasised that incorporating digital learning into the current curriculum would improve education as a whole. For example, one of the study participants noted that had students been exposed to digital learning before the pandemic, disruption in learning would have been minimal, and a switch to alternative/remote learning modes would have been much less challenging. Continuous exclusion of the digital learning framework from the educational structure implies that subsequent disruptions to in-person education in the future would undermine learning, with a higher impact on those from a poor background with uneducated parents and residing in rural areas.
4. The establishment of a smart education hub: Participants from EdTech companies and non-governmental organisations working on making education accessible to all emphasised the importance of smart education hubs to close existing learning gaps between socio-economic groups and across locations. Such hubs would act as a library, open to all students, where students can access high-quality educational materials, including computer systems, electronic documents, and an internet connection. In terms of the location of the hubs, rural areas should be prioritised to maximise impact and prevent the exacerbation of inequalities. There is also a need to increase awareness among parents about the availability of learning hubs within their community and the benefits of allowing their children to go and study in the hub. In addition, the security of the equipment must be a joint effort between the government and the host community.
5. Strengthening the adult education programme: The study found that it was relatively easy for formally educated parents to transition to the role of teacher

for their children, while uneducated parents could neither deliver lessons to their children themselves or guide them through on-air learning, nor employ a private tutor to do so when schools were closed. The pandemic has shown the benefits of educated parents, as they can act as a teacher to their children, guiding them through the alternative learning channels the government provides, such as on-air learning. Therefore, specific government policies aimed at improving adult literacy can help reduce educational inequality associated with school closure. Adequate funding of adult learning programmes, recruitment of well-trained personnel, periodic training and retraining of instructors, and proper supervision are important steps in this regard.

6. **Reliable electricity supply:** A significant drawback to learning through on-air or other digitally enabled platforms is the unavailability and unreliability of electricity across the country, undermining the availability and effectiveness of remote, digital-based learning. During a power outage, some households could afford generators or solar power, but many households, especially those in rural areas, could not. As a result, students in rural areas needed help accessing lessons delivered over the TV, which relies on electricity. One study participant noted that children became discouraged from learning during the on-air programmes due to frequent power outages. The situation indicates that the government would indirectly reduce educational inequality by making electricity consistently available and reliable. Stable power supply, especially in rural areas, can also motivate the population to acquire electronic gadgets to participate in learning programmes and access learning materials. This development would help ensure that students from disadvantaged backgrounds can be included in the learning system.
7. **Skills enhancement programmes for teachers:** Teachers are central to the use of digital tools to promote educational equality. As one of the teachers who participated in the study noted, a skills deficiency exists amongst teachers which contributed to a reliance on less technologically-advanced solutions like radios, TVs, and so on. In this way, all teachers should be trained to use digital education tools. This training would facilitate the teachers' effective use of digital tools to accelerate digital learning integration into the educational system, and would make proposals in this area more acceptable to teachers.

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## Conclusions and implications

### Discussion of results

This comprehensive study contributes significant insights into the impacts of COVID-19 on Nigeria's education sector, with a particular focus on the exacerbation of existing educational inequalities. Its findings are critical in informing future policy-making decisions that aim not only to regain lost ground but also build back better, advancing inclusive and equitable education. The goal is to fortify the education system, thus supporting the achievement of SDG 4 by 2030, a vital driver for enhancing economic competitiveness and productivity.

The study further illuminates the two primary dimensions of educational inequality in Nigeria: economic status and geographical location. Disparities in these areas have been further deepened by the pandemic, leading to substantial learning loss. The research also identifies technology as a potential equaliser in education, but cautions that the efficacy of such measures could be compromised by a lack of digital infrastructure and the persistent digital divide in terms of access. This leads to strategic recommendations on leveraging technology to promote educational equality, while addressing these infrastructural and access challenges.

The study's results reveal a distinct learning loss among students due to the pandemic. However, upon school reopening, student performance showed a marginal improvement. The dip in performance during the pandemic can be attributed to numerous factors, including prolonged school closures, increased leisure time for students, compromised nutrition, and lack of guidance from teachers. Intriguingly, the disruption had a more significant impact on high-performing students, who depended on the structured learning environment to maintain their academic focus. In contrast, low-performing students seemed less affected. This observation underscores the role of formal education structures in fostering academic excellence, particularly for above-average students.

This study also sheds light on the dimensions of educational inequality in Nigeria, revealing disparities that are less pronounced along gender lines but significantly higher between income groups and geographical locations. Prior to the COVID-19 pandemic, children in rural regions were already at a disadvantage, with lower school enrolment rates than their urban counterparts. The pandemic further entrenched this inequality.

Similarly, children from lower-income households faced exacerbated challenges during the height of the pandemic. These families were less able to participate in learning



opportunities, primarily due to economic constraints. This worsened other societal inequalities in Nigeria, highlighting the stark contrast between wealthier households that could afford digital learning tools, and economically disadvantaged ones that had limited or no access to such resources. Moreover, many children from low-income households had no alternative but to resort to labour activities to support their families during the pandemic, further depriving them of educational opportunities.

Education, being a cumulative process, has been greatly hindered by the pandemic. The study shows that students lacking access to digital tools for remote learning, or who could not afford private tutors during the lockdown, are less likely to experience any form of learning during periods of school closure. This situation threatens Nigeria's commitment to achieving equitable education and lifelong learning opportunities for all school-aged children by 2030, as stipulated in SDG 4. Furthermore, this educational disparity has potential implications for other related SDGs, including poverty

eradication and sustained economic growth. Since human capital development is crucial for the competitiveness of an economy, education inequalities undermine competitiveness, as a segment of the populace has been denied quality education required for sound reasoning and innovation. At an individual level, the study raises concerns about the medium-term consequences of educational inequality, which can amplify disparities in access to other life opportunities. Education often paves the way to higher-quality, better-paid jobs. However, those with little or no education are frequently limited to low-paying, low-quality jobs. Consequently, the existing gap between rural and urban areas is likely to persist, as is the wealth gap between children from poor and non-poor households, further undermining social mobility.

The study also found that the absence of in-person education had detrimental effects on students' motivation to learn. This meant that when schools reopened, teachers needed to make efforts to innovate their teaching methods to reinvigorate students' enthusiasm and foster classroom engagement. A key advantage of face-to-face learning is that it enables teachers to readily identify students who are struggling and require additional assistance to be kept on track. These insights strongly suggest that while digital tools have an important role in learning, they should complement rather than completely



**The adoption of radio and TV as media for remote education spoke to persistent technological challenges in Nigeria.**

substitute physical classes. Consequently, digital learning methods need to be designed such that they may enhance student participation when it is observed to be waning.

The key government intervention aimed at maintaining continuity in learning through the COVID-induced lockdown was an on-air education programme, delivered via radio and TV broadcasts. However, this intervention inadvertently underscored and amplified existing educational inequalities between areas with adequate infrastructure and those lacking it. Weak infrastructure, combined with insufficient electricity supply particularly in rural areas (where 24.6% have access to electricity compared to 83.9% in urban areas), further disadvantaged those in rural regions. Moreover, while urban residents had more access to alternative power sources like generators during power outages, this was less common in rural areas (World Bank, 2023). With radio coverage also considerably lower in rural areas (22%) compared to urban areas (49%), disadvantaged students in rural regions were further restricted from participating in remote learning during the school closure, exacerbating educational inequalities.

Stakeholders across the educational sector recognise the significant role technology plays in education. However, the extent to which technology has been integrated into educational delivery still falls short of its potential. This inadequate integration is largely attributed to insufficient capital or development funding for the sector, which exacerbates inequalities and undermines the effectiveness of learning during emergencies like the COVID-19 pandemic. Without comprehensive technology integration, the country's educational progress risks stagnating, resulting in lower national educational attainment levels, especially when compared to countries that have incorporated technology effectively into their education systems. This disparity could subsequently lead to unequal progress towards the global goal of inclusive education.

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## **Policy recommendations**

### **Upscale accelerated learning programme**

Evidence from this study indicates that students experienced learning loss due to school closures. So to close the learning gap, there is a need for the government to complement the education system with an accelerated learning programme. Such a programme would ensure that the topics the students could not learn during the pandemic were taught. Before the pandemic, international non-governmental organisations, with the support of the Ministry of Education, were rolling out accelerated learning programmes in conflict-affected parts of northern Nigeria in states with high numbers of out-of-school

children (Diazgranados, 2022). Lessons from the programme should guide the integration of accelerated learning into the existing curriculum to ensure that the pandemic does not have permanent impact on students, especially those in rural areas and from poor households.

## **Increase investment in communication and digital infrastructure**

While radio and TV coverage is generally high in Nigeria, it is only available in some parts of the country, and the coverage is far lower in remote rural locations. As a lesson from the pandemic, this study has found that radios could serve as a medium to facilitate teaching and learning. To effectively utilise radio and TV as a tool for remote learning, there is a need for radio and TV coverage to increase across the country. This can be achieved through policies that encourage private stations to invest in expanding their coverage to remote areas that are difficult to reach. To this end, the government can offer tax incentives and provide infrastructure to facilitate this expansion. This would create opportunities for all children, including those from less privileged backgrounds, to access radio-powered learning.

Furthermore, closing the digital divide between rural and urban areas should be a priority to ensure equitable access to education. The COVID-19 pandemic has highlighted the importance of technological innovation in education and the need for Nigeria to invest in expanding digital infrastructure to support learning. While radio has been a valuable tool during the pandemic, there are other digital learning platforms that many children in rural and less privileged areas cannot access. Therefore, the government should prioritise expanding digital infrastructure and creating platforms that are close substitutes for face-to-face classroom interaction. This requires policies and investments that encourage private sector participation and expand access to the internet and other digital resources, especially in rural areas. The pandemic has exposed the growing learning divide between students from poor and non-poor households, and addressing this gap through expanded digital infrastructure and access to virtual learning would minimise the pandemic's impact on educational inequalities.

## **Integrate digital learning into teaching**

The experience of COVID-19 indicates that at the federal and the sub-national levels, there is a need to review approaches used in teaching. Blended learning, incorporating face-to-face and digital learning, needs to be adopted and implemented, as it reduces the inefficiencies associated with reliance on only physical interaction. Digital learning is also a reliable alternative to switch to whenever there is an unplanned school closure during an academic session. The Universal Basic Education Act has an ongoing intervention to

establish innovative schools in all 36 states of the federation, as revealed by one interviewee. This is a useful initiative that could be consolidated, as it would reduce existing educational inequalities by enabling rural areas greater access to digital learning. In this way, such schools should not only be limited to urban areas, but rather rural areas should also be prioritised to promote and ensure educational equality. The innovative schools would feature in-person schooling, but using mainly digital tools. Currently, in-person education involves the teacher engaging in teaching by being present in the classroom. However, in smart schools learning is aided through digital technologies. Digital technologies may help to an extent with the problem of teacher retention in rural schools, with digital tools potentially being used where needed as a substitute for teachers being physically present in the classroom. Furthermore, smart schooling helps standardise learning, with students having access to the same quality educational materials, regardless of their location.

## **Invest in adult education programmes**

The Multiple indicator cluster survey (NSB & UNICEF, 2022) indicates that about 42.5% of adults (15–49 years) in Nigeria are literate, with a wide disparity between those in rural and urban areas: 62% of adults in urban areas are literate compared to 26% in rural areas. Also, the literacy rate is about 8.5% among the poorest Nigerians and 79.2% among the richest. At the pandemic's peak, educated parents could teach their children, while uneducated parents could not. While older siblings acted as teachers for their younger siblings during the school shutdowns, the impact is likely to be felt more in households where the parents are illiterate. As a result, an adult education programme is crucial to ensure that parents who did not go to school have the opportunity to learn in later life.

This intervention would have three primary benefits. First, increased literacy improves national growth and development. Second, the programme would empower parents to take on the role of teacher whenever schools are closed, as was experienced during the pandemic. Third, educating parents increases their investment in their children's education.

## **Upscaling of teachers' skills**

At the height of the pandemic, some teachers began using digital tools to teach. Most others, however, could not do so due to a lack of digital skills, which limited the extent to which they could migrate to digital platforms to continue teaching. As we move into post-pandemic recovery and look towards improving resilience in the educational sector, the skill level of teachers needs to be upgraded frequently. The pandemic has shown that proficiency in digital skills is essential in optimising the gains provided by

technological advancement. Thus, the focus of government and school management should be on ensuring that teachers are proficient in digital skills, such that an increase in investment in digital infrastructure will translate into usage. In this way, digitally literate teachers could design lessons and deliver them effectively using digital platforms and in line with changing digital demands.

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