

Differential Impact of the COVID-19 Pandemic on Education in Nigeria: Implications for Policy Review

*Kehinde O. Omotoso,
Ololade G. Adewole
and
Taiwo F. Gbadegesin*

Working Paper HCD-ICCS-006

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

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By

Kehinde O. Omotoso

*National Centre for Technology Management,
Obafemi Awolowo University, Ile-Ife, Nigeria
DST/NRF SARChI Chair in Social Policy,
College of Graduate Studies,
University of South Africa, Pretoria*

Ololade G. Adewole

*National Centre for Technology Management,
Obafemi Awolowo University, Ile-Ife, Nigeria*

and

Taiwo F. Gbadegesin

**Queen Margaret University, Edinburgh,
Scotland, UK*

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are, however, those of the author and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

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Abstract

COVID-19, a World Health Organization (WHO)-declared pandemic and infectious disease caused by coronavirus, adversely affected various aspects of economies worldwide, with over two million fatalities, and millions of individuals and families affected. Like most countries, Nigeria implemented a lockdown policy restricting all movements except for essential services and functions, to contain the virus. This raises questions about the specific shocks, the catalytic trigger, mitigating strategies, emergent e-learning initiatives, and challenges. This paper investigates the various ways through which COVID-19 influenced the education sector in Nigeria. The study adopted a concurrent mixed method to examine the impact of the COVID-19 lockdown on learning activities in Nigeria. It employed the General Household Survey (GHS) panel 2018–2019 Wave 4, the 2020 Nigeria COVID-19 National Longitudinal Phone Surveys (COVID-19 NLPS) and a difference-in-difference method under a natural experiment scenario, complimented by qualitative data collected through organised stakeholder panel interviews across three significant zones: Abuja, Ile-Ife (Osun State) and Port Harcourt (River State). Educational (learning & teaching) shocks emerged due to the lockdown. The paper reports the interconnectivity of shocks that exposed lapses during the COVID-19 pandemic in the governance of the educational system, school environment, home front and learners' reactive strategies. The variants of the specific shocks and reactive strategies categorically feature multidimensional outlook within the context of private stakeholders (parents and learners) and public stakeholders (education ministry and school administration). The lockdown-induced shock increased the probability of using digital tools to assess learning materials in 2020 compared to 2018/2019, though there was generally low access to digital tools for learning by those affected by the lockdown-induced shock. Several e-learning challenges were identified as many educators were technically deficient due to inadequacy or lack of internet facilities and capacities for new learning styles, android phones/laptops, lack of network coverage or network failures, full subscription to learning platforms such as Zoom or Microsoft Teams not budgeted for, power failure, uneven distribution of new learning facilities during COVID-19 and unpreparedness for the shock. Policy recommendations include the provision of e-learning platforms and projects in schools, and reduction of inequality in the access to e-learning.

Keywords: *COVID-19; differential; education; natural experiment; Nigeria*

1. Introduction

The COVID-19 pandemic, a globally recognised outbreak that caused widespread disruption, adversely affected various aspects of the economies of the global North and South (WHO, 2020), stressing the need for all countries to learn and change in different ways to bring about restoration of the various aspects of their economies (Oldekop et al., 2020). The adverse impacts of COVID-19 were enormous on the socio-economic outlook of human lives, coupled with its concomitant challenges on all sectors of the global economy, ranging from education, to agriculture, manufacturing, tourism, health and services, amongst others. The consequences for the African continent were huge given the vulnerability of the large sections of the populations (ILO, 2020; Azubuike et al., 2021).

The incidence and effects of the pandemic were particularly huge in Nigeria. For example, by 2 September 2021, the total number of confirmed cases of COVID-19 infections in the country was 193,013, and the number of active cases and deaths were 11,533 and 2,480 respectively (Nigeria Centre for Disease Control, 2021). Like most countries did at the onset of the pandemic, Nigeria implemented a lockdown policy restricting all movements except for essential services and functions to contain the virus. Notably, one of the measures introduced to curtail the spread of the virus, especially among the young ones, was the closure of all schools. This measure was targeted at reducing physical interactions among people as much as possible. The prevention and control measures during the COVID-19 pandemic served as perfect conditions for a natural experiment. This has provided an opportunity to investigate the extent to which the lockdown measures impacted the education sector in the short term.

Meanwhile, before the pandemic, Nigeria, as a developing country, faced many challenges, including a weak educational system coupled with high gender differentials in the school enrolment, number of out-of-school children and school dropout rates across different education levels (Odia and Omofonmwan, 2007). These challenges have been a major concern to policy makers and key stakeholders in the education sector and a big hindrance to attaining universal basic education for all and education-related Sustainable Development Goal 4, which aims to ensure inclusive and equitable access to quality education and promote lifelong learning opportunities for all.

Access to quality education is an important component of human capital development. Ensuring equitable access to educational services could invariably improve human capital and, by extension, the population's health in the long run

(Akande-Sholabi, 2020). To this end, the Nigerian governments have embarked on various national education policies and reforms to improve the development of the country's human capital across all levels of education, from pre-primary/early childhood to tertiary. Several measures and strategies have been implemented to boost equitable access to education (Federal Ministry of Education, 2004; Ibukun and Aboluwodi, 2010; Imam, 2012; Ajibade, 2019). At the Global Education Summit on Financing Global Partnership for Education (GPE) 2021–2025, Nigeria's President pledged to increase the budget for the educational sector by 50% in the next 2 years. The summit was held in London on 29 July 2021, and aimed at raising investment to help transform education for the most vulnerable children in up to 90 lower income countries and territories around the world.

Despite past national policies and reforms on education, access remains inequitable and inadequate across the country's different states, gender and socio-demographic lines. For example, a 2022 UNICEF report showed that Nigeria had the largest number of out-of-school children worldwide, having increased by 2.7 million. (UNICEF, 2022). More pertinently, the unprecedented COVID-19 pandemic exacerbated the pre-existing inequality in access to education in the country. Schools were ordered to close and adopt alternative means of learning and teaching. The academic calendar was disrupted unexpectedly, and the means of livelihood for several teachers was affected negatively (Briggs, 2020; Olaseni and Olaseni, 2020; Proulx et al., 2021). Consequently, most students had to stay home or opt for home lessons. Unfortunately, the lockdown order forced some students to become idle, drop out of school, and go into transactional sex and forced marriages.

Research evidence suggest that there are different perspectives to understanding the impact of COVID-19 on learning and teaching in Nigeria (Okaegbu et al., 2023; Ebohon et al., 2021; Ndejjo et al., 2023; Azubuike et al., 2021; Soudien 2020). Many of the studies seem to attribute learning losses during the pandemic to digital divides and total inaccessibility to learning opportunities. For example, Okaegbu et al (2023) examined the role of teacher-student digital literacy in mitigating the effect of COVID-19 in the Nigerian education sector. The authors found out that teachers' and students' inability to engage in online instructional activities during the lockdown was due to low competence and confidence in the use of technology (Endler et al., 2021). Studies suggest differential patterns in access to education service use (Olaseni and Olaseni, 2020).

Our study adds complementary evidence to the literature on the impacts of COVID-19 lockdown measures on access to learning activities. Therefore, it complements findings from previous and concomitant empirical studies by examining and analysing the impacts of the lockdown order on access to schooling and other selected education variables using a natural experiment method.

Aim and objectives

The study aims to evaluate the differential impacts of the COVID-19 pandemic on education or learning activities in Nigeria across gender and various levels of education.

The specific objectives were to:

- (i) Examine the differentials in education or learning activities before and during the COVID-19 pandemic in Nigeria.
- (ii) Examine the distribution of alternative learning activities during the COVID-19 pandemic lockdown in Nigeria.
- (iii) Estimate the differential effects and contributions of socio-demographic factors to adopting alternative learning activities during the COVID-19 pandemic lockdown in Nigeria.
- (iv) Explore contextual factors, such as missed learning opportunities, loss of access to vital school-provided services, health and nutrition, social protection, and social safety nets (home-grown schools feeding initiative), and access to and uptake of ICT-based resources, which influenced learning activities.

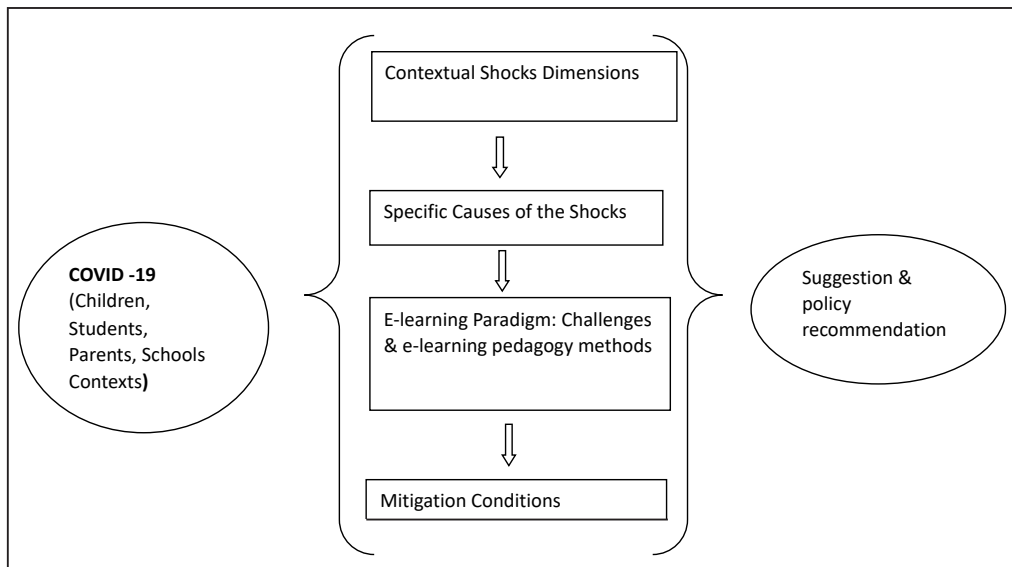
2. Conceptual framework

Similar to the United Nations (UN) framework, which provides the strategy and blueprints for the urgent socio-economic response during COVID-19 to minimise the impact of the pandemic on the most vulnerable populations (UNSDG, 2020), we provided a conceptual pathway that drove the direction of the study toward policy-informed recommendations. It addresses the educational fragilities and gaps (shocks) predisposing education stakeholders to vulnerability due to COVID-19. It also points the way toward addressing future shocks. The response engenders a profound reflection on different aspects that can initiate transformation into a declining state of learning, teaching and achievement of broad educational goals in Nigeria. Including children, students, parents and school-related shocks, the framework aimed to comprehend the intricacies surrounding education and economic issues. It offers essential information for examining gaps in e-learning.

The components of the response document in the framework experiments examine the differential impact of COVID-19 across geopolitical zones in Nigeria. Our framework tangentially addresses six primary areas that connect learning and teaching focus: (1) Educational stakeholders' health; (2) Social protection and basic services; (3) Economic response and recovery: Protecting teaching jobs; (4) Multinational and multilateral collaboration; (5) Social cohesion and community resilience and (6). Awakening government responsibilities. Moreover, the framework has the potential to address policy and resource gaps in evaluating the differential impacts of COVID-19 at national and international levels and a range of other measures to assess in reaching out to priority subpopulations.

As indicated in Figure 1, our framework aligns with and extends from the three-point response framework targeting children, teachers and funding requirements drafted by the Nigerian Education Working Group in collaboration with Save the Children and the United Nations Children's Fund (UNICEF). Our response objectives were tied to identifying setbacks, causes, new education pathways and the most effective strategies to revitalise COVID-19-induced school closure consequences: (i) Learning and teaching shock; (ii) Contextual causes of the shocks; (iii) Mitigating strategies; (iv) E-learning strategies and challenges; and (v) Policy action to ensure a successful, inclusive and secure return to high-quality learning for students, children, teachers, and the education ministry.

Figure 1: Conceptual Framework for Examining the Differential Impact of COVID-19 on Learning and Teaching in Nigeria (adapted from UNSDG, 2020)



3. Methodology

Research design

This study adopted a mixed-method approach involving quantitative and qualitative data collection and techniques. The quantitative data collection entailed secondary data sets comprising nationally representative samples from the Nigeria General Household Survey, Panel 2018–2019 and the Nigeria COVID-19 National Longitudinal Phone Survey (Nigeria COVID-19 NLPS). The quantitative identification strategy relied on Difference-in-Differences (DID) estimation technique. Qualitative data were collected by gathering primary data through focus group discussions (FGDs). The data were analysed using content and thematic analyses.

Scope

The study covered a differential assessment of the COVID-19 pandemic on education or learning activities in Nigeria, considering the period before, during and after the pandemic. Thus, this study was limited to analyses in this period on the impacts on: (i) school children and their access to alternative learning activities and or technologies; and (ii) parents, teachers, regulatory authorities, community and other pertinent stakeholders', and their perspectives on the way forward and suggestions for policy review.

Data requirements and collection methods

As indicated earlier, this study used primary and secondary data. The primary data were collected through FGDs with pertinent stakeholders, including students, parents, teachers, head teachers, government officials, regulatory authorities and bodies, amongst other. The secondary data were drawn from the Nigeria General Household Survey, Panel 2018–2019, Wave 4, and the Nigeria COVID-19 National Longitudinal Phone Surveys (COVID-19 NLPS), which contain nationally representative samples of households. Primary data were collected through fieldwork. The Nigeria General Household Survey Panel (GHS-Panel) component is a nationally representative survey of approximately 5,000 households, which are also representative of the country's 6 geopolitical zones.

The 2018–2019 GHS-Panel is the fourth wave of the living standard measurement survey (LSMS), with prior waves conducted in 2010–2011, 2012–2013 and 2015–2016. This survey was implemented by the National Bureau of Statistics (NBS) in collaboration with the World Bank Living Standards Measurement Study (LSMS) team. The 2018–2019 GHS-Panel households were visited twice: first after the planting season (post-planting) between July and September 2018 and second after the harvest season (post-harvest) between January and February 2019. Units of analysis were households, agricultural plots and communities.

The 2020 Nigeria COVID-19 National Longitudinal Phone Surveys (Nigeria COVID-19 NLPS) were also conducted by the NBS in collaboration with the World Bank. The households sampled in the surveys were drawn from the sample of households interviewed in Wave 4 of the 2018–2019 GHS. About 5,000 households selected randomly across the country's 6 geo-political zones (see Figure 2), formed the target frame from which the survey sample sizes were drawn. This comprises the households previously interviewed in the GHS-Panel 2018–2019, Wave 4. To easily reach 2020 survey respondents from the 2019 survey, phone numbers of heads of household and three other close relatives were documented. These numbers were subsequently used to contact the selected respondents for the 2020 monitoring survey. This survey sample was thus drawn randomly from the pool of about 5,000 households. In total, over 3,000 phone numbers were selected from the target frame using a balancing sampling approach (sex and education status of household head, household size and location) to retain the characteristics of the frame.

This research used the ninth round of the 2020 Nigeria COVID-19 NLPS. The ninth round was used because it contains variables of interest. Though a sample size of 1,800 was targeted, a larger number (additional 60%) was contacted to cater for non-response and loss of interest in the survey. Subsequently, the study's sample size varied across the rounds due to non-responses, unreachable phone lines, etc. Units of analysis were individuals and households, and a questionnaire was used to elicit relevant data from the sampled head of the participating households. The surveys were conducted in several rounds, with slight changes in the questionnaire used at each stage (NBS 2022).

Sample size and sample procedure

Qualitative data was gathered from three geopolitical zones in Nigeria. These are North-Central (Abuja), South-South (Port Harcourt) and South-West (Ile-Ife), which represent three major ethnic groups in Nigeria, namely Hausa, Igbo and Yoruba. Three FGDs were conducted in each state with a total of 12 FGDs.

Data analysis

The primary and secondary data were analysed using appropriate tools and techniques. The primary data was analysed using thematic and content analysis using Atlas.ti software and the secondary data was analysed and presented using descriptive and inferential statistics, including simple percentages, cross-tabulation, regression models and DID estimation techniques.

Hypotheses

In this study, school closures were assumed to have an impact on learning and the adoption of digital learning platforms, disproportionately across socio-demographic lines. Thus, the following hypotheses were put forward.

- i. **Hypothesis 1:** School closures implemented during the COVID-19 outbreak indirectly increased the use of digital learning platforms in Nigeria.
- ii. **Hypothesis 2:** During the prevention of COVID-19 pandemic in Nigeria, the adoption of digital learning was improved to different extents due to inequality in socio-demographic characteristics.

Definition of key variables

The school closure shock

In this study, we emphasised that observed changes in the adoption of digital learning platforms due to school closure were driven by the COVID-19 pandemic lockdown, not individual or household members' preferences.

Digital learning adoption

We measured digital learning adoption with self-reported responses. The respondents were asked if a learner/child had access to learning on some listed digital tools which included smart phone, tablet or laptop computer, television, radio, printer, etc. The response to the question was either a Yes or No for each of the listed digital tools.

Exposure measure

Our exposure measure or treatment indicator was a binary variable taking value one if the individual/child was reported to be then out of school or had not attended school since the beginning of the lockdown, and zero otherwise. The interviewed individual/

child or any other responsible household member could answer the question on the prevailing status of the learner child's school attendance. As such, exposure was identified on the individual level.

Model specification

Understanding the causal effects of the school closure shock

For the DID estimation, data from 2018 to 2019 were used as the control group, while data from 2020 were the experimental group. The DID specification is as follows:

$$Y_{it} = \alpha_1 + \beta_1(EXPOSURE * POST)_{it} + \gamma_1 EXPOSURE_{it} + \delta_1 POST_{it} + \alpha_2 X_{it}' + \lambda_i + \delta_t + \epsilon_{it} \quad (1)$$

Where:

Y_{it} is digital tools access/adoption at time t for individual i ; $EXPOSURE_{it}$ is the binary exposure indicator taking value 1 for exposed and zero for unexposed (i.e school attendance/closure); $POST_{it}$ is the before-and-after dummy variable taking value 1 for the post-exposure period and 0 for the pre-exposure period; $(EXPOSURE * POST)_{it}$ is the DD-estimator, with β_1 indicating the average causal effect of the lockdown shock on digital learning adoption; X_{it}' represents the control variables, including socio-demographic variables, types of school, metropolitan status etc.; λ_i is the state fixed effect, which captures all time-invariant differences across states; δ_t is the day fixed effect, which controls for the daily shocks common to all states; ϵ_{it} is a random disturbance term; and β_1 is the coefficient of interest which captures the effect of the lockdown on the outcome variable.

We clustered standard errors in all estimations on the panel level, which is the individual (Wooldridge, 2010; Cameron and Miller, 2015).

Based on the level of response by different states to school closure, the DID estimation is specified as:

$$Y_{it} = \alpha_4 + \beta_2 4(EXPOSURE * dd)_{it} + \beta_2 5 dd_{it} + \gamma_4 EXPOSURE_{it} + \alpha_5 X_{it}' + \lambda_i + \delta_t + \epsilon_{it} \quad (2)$$

Where dd_{it} is a dummy variable that represents whether a lockdown order was enforced or not in a state. Our focus was on Lagos State and the federal capital territory Abuja where the lockdown order was enforced more strictly than in other states. If the lockdown was enforced in the state, $dd_{it} = 1$; otherwise, $dd_{it} = 0$. $\beta_2 4$ is the coefficient of primary concern.

Description of data

Sample characteristics were balanced between those individuals exposed and unexposed to the lockdown-induced shock (Table 1). Small variations occurred in, for example, access to digital learning tool, which was on average higher among those unexposed before and after 2020 than among those who were exposed. A greater percentage of those without access to digital learning were the unexposed. Moreover, a larger proportion of individuals in the exposed category were adult, aged 18–45 years (59%), and males (52.5%) compared to their counterparts in the unexposed category. With respect to school level characteristics, a greater percentage of the exposed were those in the primary and secondary levels of education (55% and 36% respectively), as opposed to those in nursery schools and higher institutions of learning. Similarly, a higher proportion of individuals in rural areas were exposed to the shock, and the level of exposure varied across the six geopolitical zones.

Table 1: Descriptive statistics by exposure status

	Exposed (n = 14,843)		Unexposed (14,402)	
	N	%	n	%
A. Outcome				
No access to digital learning	2,247	15.4	2,398	17.1
Before: Access to DLT	1,872	14.1	1,736	14.7
After: Access to DLT	375	2.9	662	5.0
B. Individual characteristics				
0–17 years	2,540	17.1	12,804	88.9
18–45 years	8,754	59	1,575	10.9
46–65	2,786	18.8	22	0.2
66 years and above	763	5.1	1	0
Female	7,121	48	6,834	47.5
Male	7,722	52	7,568	52.5
C. Household characteristics				
Household size	8.80 (3.65)			
D. School level characteristics				
Nursery	61	4.7	1,501	12
Primary	716	55.4	5,757	46.1
Secondary	468	36.2	3,792	30.4
Higher degrees	47	3.6	1,444	11.6

continued next page

Table 1 Continued

	Exposed (n = 14,843)		Unexposed (14,402)	
	N	%	n	%
North Central	2,156	14.5	2,568	17.8
North East	2,244	15.1	2,633	18.3
North West	2,606	17.6	2,736	19
South East	2,647	17.8	2,168	15.1
South South	2,681	18.1	2,188	15.2
South West	2,509	16.9	2,109	14.6
Rural	9,495	64	9,603	66.7
Urban	5,348	36	4,799	33.3
F. Year				
2018	13,250	89.3	11,810	82
2020	1,593	10.7	2,592	18

Note: Means of household size with standard deviations in parenthesis. Descriptive statistics are computed over the full available data, 2018–2019 and 2020; means for Panel A are split into the time before and after the lockdown shock, that is, before 2020 and in 2020.

4. Empirical results

Quantitative findings

Table 2 presents the causal effect estimates. The results show a positive relationship between the Difference-in-Differences (DID) estimate and the outcome variable, though the coefficient is not significant at any conventional level. This implies that the lockdown-induced shock increased the probability (by about 1.7%) of using digital tools to assess learning materials in 2020 compared to 2018–2019. However, there was generally lower access to digital tools for learning by those affected by the lockdown-induced shock, while there was improved access to the digital learning platform in 2020 (15.2%). The result further suggests that younger children had more access to learning digitally than older children. Moreover, the probability of accessing digital learning tools was higher for males than for females. Compared to North Central, the likelihood that a digital learning tool will be adopted was higher in North West, South West, South South and South West, and lower in North East. Surprisingly, the result indicates that urbanites were less likely to access learning digitally.

Table 2: Causal effects of COVID-19 lockdown on adoption of digital learning

	(1)	(2)
Exposure (Yes)	-0.002	0.008
	(0.004)	(0.007)
Year 2020	0.152***	0.162***
	(0.013)	(0.014)
Exposure*Yes	0.017	0.008
	(0.017)	(0.018)
Age		0.001
		(0.001)
Age squared		-0.000
		(0.000)
Gender (Male)		0.002
		(0.004)

continued next page

Table 2 Continued

	(1)	(2)
North East		-0.006
		(0.008)
North West		0.008
		(0.007)
South East		0.001
		(0.008)
South South		0.004
		(0.007)
South West		0.016*
		(0.008)
Metropolitan status (urban)		-0.010
		(0.005)
Constant	0.143***	0.121***
	(0.003)	(0.013)
R^2	0.02	0.02
Adjusted R^2	0.02	0.02
F-Statistics	132.56	34.03
Observations	28502	28502

Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Given the initial level of response by different states to school closure, Table 3 presents results of the DID estimates for Abuja and Lagos the two main cities where prolonged lockdowns were enforced. In the table, column (3) presents the result for Lagos and (4) the results for Abuja. The results show that those not exposed in Lagos were 0.4% less likely to adopt digital learning tools, though access to was generally high. Meanwhile, those in Abuja were 5.6% more likely to adopt the tools although access to them was low. As hypothesised access to digital learning tools was higher in 2020 than in 2018. Younger children had more access than older ones. Males were also more likely to access digital learning tools than females.

Table 3: Causal effects of COVID-19 lockdown adoption of digital learning

	(3)	(4)
No exposure*Lagos	-0.041*	
	(0.021)	
Lagos	0.037*	
	(0.016)	
Exposure	0.008	0.011
	(0.007)	(0.007)
Year (2020)	0.167***	0.166***
	(0.009)	(0.009)
Age	0.001	0.001
	(0.001)	(0.001)
Age squared	-0.000	-0.000
	(0.000)	(0.000)
Gender (Male)	0.002	0.002
	(0.004)	(0.004)
No exposure*Abuja		0.056*
		(0.026)
Abuja		-0.035*
		(0.018)
Constant	0.120***	0.120***
	(0.011)	(0.011)
R^2	0.02	0.02
Adjusted R^2	0.02	0.02
F-Statistics	57.80	57.82
Observations	28502	28502

Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Qualitative findings

The COVID-19 pandemic wreaked havoc on the Nigerian education system, though at varied levels across the country's geopolitical zones. We conducted a series of stakeholder meetings within three principal regions of Nigeria to elicit information on the pandemic's specific effects, causes, paradigm shift and people's expectations of government action for future implications.

The pandemic broke out in Nigeria in November and December 2019, and August 2021. The stakeholders' meetings, an interactive forum, incorporated a form of focus groups that brought together professionals and education personnel from the education bodies and agencies in Abuja (Federal Capital Territory (FCT)), Ile-Ife (Osun State), and Port Harcourt (River State). The meeting took place in conference halls at the three locations in the country between August and September 2022, between 10.00

am and 2.00 pm. The distribution of the meetings was informed by the pilot study, which established that the three locations adequately provided robust and in-depth information concerning the effects of the pandemic. The qualitative approach provides the embeddedness and triangulation that augment the outcomes of the quantitative analysis, sequentially conducted. We utilised a computer-aided qualitative data analysis tool (Atlas.ti, version 22.1).

The thematic analysis generated several themes (categorisation). We noted and addressed the key subjects' interrelationship, duplication and uniformity (themes). The visualisation networks provide the themes at a glance. Our thematic analysis provided narratives that explain the contextual educational (learning and teaching) shocks of COVID-19 lockdown on education, specific causes of shocks experienced, mitigating strategies, e-learning strategies, and challenges, condition of service and support during the pandemic, identified gaps and lapses, and suggestions that could better prepare us for unprecedented shocks to education or learning activities, and thus foster proactive policy formulations.

Demographic profiles of participants

The stakeholders' forum comprised stakeholders from all levels of education in Nigeria, namely primary, secondary and tertiary. The participants were described in terms of age, educational background, occupation, working experience and marital status. Socio-demographic information provided by the respondents cut across different age groups of young and old, single and married, educated, Christians and Muslims.

Respondents comprised representatives from both public and private schools, including teachers, parents, students, proprietors, principals, ICT practitioners in higher learning, lecturers, representatives from non-governmental organisations (NGOs), and educational boards of trustees from primary, secondary and tertiary institutions such as National Universities Commission (NUC), National Board for Technical Education (NBTE), National Commission for Colleges of Education (NCCE), Ministry of Education, and State Universal Basic Education Board (SUBEB).

Contextual educational (learning and teaching) shocks of Covid-19 on education during the outbreak.

Based on the participants, 10 documents emerged from the workshops/meetings. We identified different themes across the primary school, secondary school, and tertiary institution levels in the transcripts and the coding processes. The filtered shocks are discussed in three parts, namely shocks at the primary school level, secondary school level and tertiary level. At the primary and secondary levels, we identified shocks at the home (family) front, pupil-related, and the teachers/school/government perspective (education providers). The report details student-related and tertiary institution management-related shocks at the tertiary level. Figures 3a to 3g indicate the visualisation networks and details from the thematic analysis.

At primary school level

Numbers of filtered shocks emerged: increased dropout rate, prostitution, forced marriages, non-completion of syllabus/curriculum, educational learning, cognitive setback, learning attention diversion and hatred for schooling. Through the grounded values, the learning and cognitive setback was profound, evident in the learning attention diversion, hatred for schooling, increased dropout, transactional sex (prostitution) and forced marriages, especially among the higher primary pupils in northern Nigeria. The findings align with those from extant studies (de Miranda et al., 2020; Hoofman and Secord, 2021) that children's emotional setback triggered learning retrogression among them during the COVID-19 pandemic. Figure 3a provides the visualisation network that highlights the connectivity. Two finance-related factors underpinned the shocks identified from the parents' perspectives (family front). The filtered shocks emerged, including changes from private school to public school due to lack of funds and parents' financial challenges to keep up with the cost of their children's online learning. The finding corroborates those of Wilson et al. (2020) and Gadermann et al. (2021) that the pandemic and its associated lockdown negatively affected household livelihood and economic activities. The outbreak of the COVID-19 pandemic wreaked havoc on the socio-economic activities of the family, and this constrained their financial capabilities.

The thematic analysis result indicates that shocks from teachers' angles are worth mentioning and reporting. Our analysis filtered five distinct teacher-related shocks: difficulties in delivering the curriculum, socio-emotional trauma, loss of teaching jobs, disrupted teachers' teamwork and communalism. Teachers play vital roles in conveying children's care and education, roles similar to those from extant studies (Pokhrel and Chhetri, 2021; Calcar et al, 2022). Our thematic analysis of the phenomena in the school's physical environment and their management capabilities while providing support during the pandemic identified 14 interconnected filtered shocks: a shift from a traditional/communal learning style, disrupted programmes for skills acquisition, difficulties in providing training for teachers, learning and education stoppage, interrupted learning activities/closures of schools, incomplete syllabus/curriculum, private schools providing e-learning more than public schools, no school sport, overloaded work without quality assurance for teachers, difficulty paying teachers' salaries, insufficient teachers to manage increased classrooms, a shift to radio and television learning, splitting and dividing pupils/students into small classes, and emergent private and public school dichotomy. Global literature provides insights into how school environments, facilities and stakeholders' experienced shocks at different dimensions (Hoofman and Secord, 2021; Pokhrel and Chhetri, 2021).

The thematic analysis results indicate that shocks from the government angle (Ministry of Education, State Universal Basic Education Board (SUBEB) are worth mentioning and reporting. Our analysis filtered five blue-coloured shocks, including difficulties in sustaining radio learning, lack of commitment to social protection, lack

At secondary school level

In addition to the findings mentioned at primary school level, shocks at secondary level included the issues of forgotten past learning, cut off socialisation, poor assimilation, drop in students' performance, retrogressive care and upbringing, psychomotor domain of learning were missing teachers, pupils and students' socio-emotional trauma, long stay at home, loss of classroom interaction, exposure and addiction to bad films, loss of peers interaction/relationship, mass failure, mental/medical shock/depression, missed debates, missed inter-house sports, missed learning opportunities through excursions, missed opportunities for leadership skills training, missed opportunities for working together in a practical class, missed school competition, no club activities and unusual one way communication. Student-Related Shocks at Secondary Level is depicted in Figure 3c.

At the home-front similar experiences as those from primary school level were reported. Globally, these results align with findings from extant students (Hoofman and Secord, 2021; Pokhrel and Chhetri, 2021) that children's emotional setback triggered learning retrogression among them during the COVID-19 pandemic. Figure 3e provides the visualisation network that highlights the connectivity. The finding corroborates those of Wilson et al. (2020) and Gadermann et al. (2021) that the outbreak of the pandemic brought about economic hardship on individuals and households. The COVID-19 pandemic wreaked havoc on the socio-economic activities of the family, constraining their financial capabilities. Figure 3d provides the visualisation network that highlights the connectivity. The extracts of the script are reported accordingly.

Our analysis filtered distinct teacher-related shocks, including idleness, lack of ICT skills and technical know-how, pedagogy setback, pressure on the students and teachers, and teachers' teamwork and communication affected. In consonance with previous research, teachers play an important role in the education of children. Consistent with existing research, teachers are essential in communicating the care and education of children, (Pokhrel and Chhetri, 2021; Calear, McCallum, Morse, Banfield, Gulliver, Cherbuin, ... & Batterham, 2022). Figure 3e provides the visualisation network that highlights the connectivity. The extracts of the script are reported accordingly. We identified interconnected filtered shocks, including difficulty paying teachers' salaries, COVID-19 exacerbated substandard learning activities, splitting and dividing students into small classes, drop in school enrolment, the government being unprepared for a new approach to education, uneven distribution of new learning facilities during the pandemic, a shift from a traditional/communal learning style, paralysed education sector, interrupted learning activities/closures of schools and special needs children not being included.

Global literature provides insights into school environments, facilities and stakeholders' experienced shocks at different dimensions (Hoofman and Secord, 2021; Pokhrel and Chhetri, 2021). Figure 3e provides the visualisation network that highlights the connectivity. Even the government was in rude shock/unpreparedness with evidence of rural–urban dichotomy, findings that align with those from extant studies (Al-Samarrai et al., 2020). Figure 3e provides the visualisation network that highlights the connectivity.

Figure 3c: Network Diagram Showing Secondary Students Related Educational Shocks During COVID-19 Crises

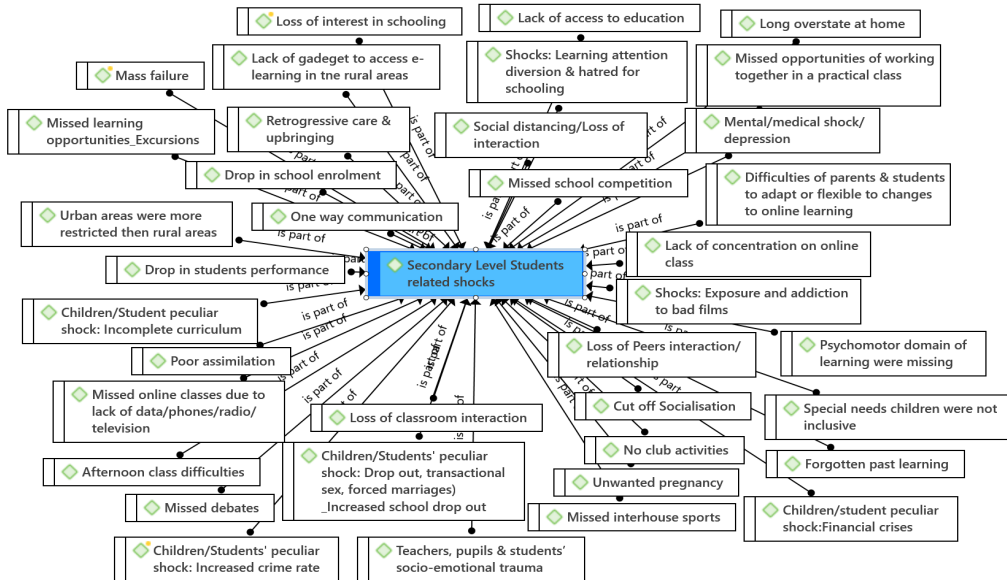


Figure 3d: Network Diagram Showing Secondary Students Related Family-related Shocks During COVID-19 Crises

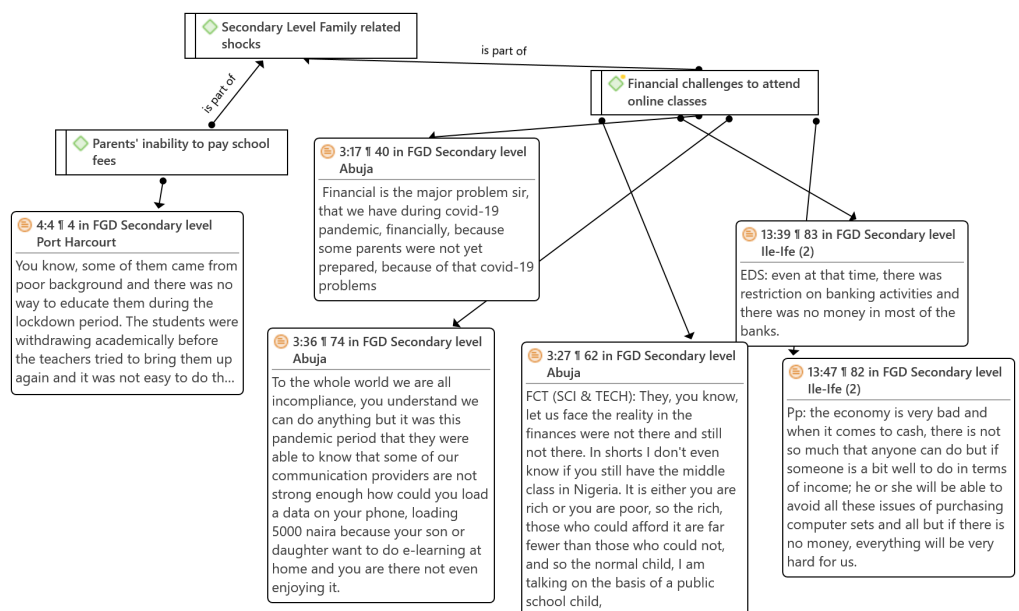
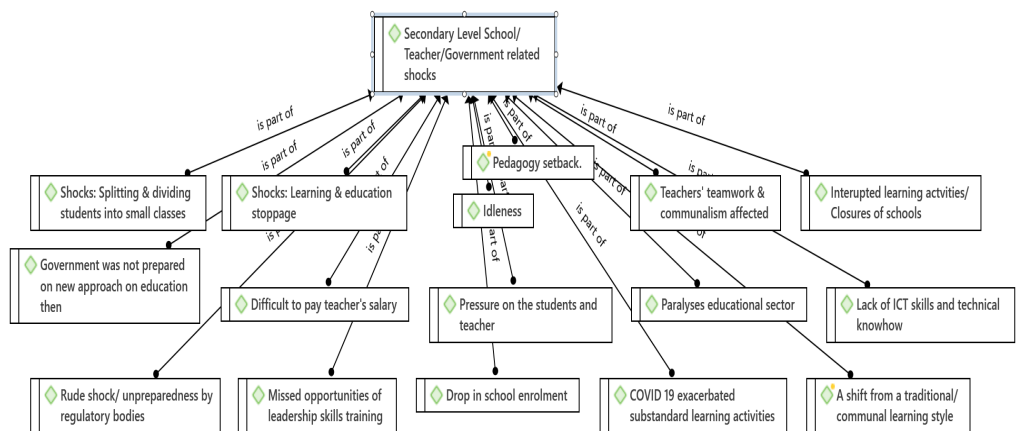


Figure 3e: Network Diagram Showing Secondary Level School/Teacher/ Government-Related Educational Shocks During COVID-19 Crises



At tertiary institution level

The filtered student-related shocks at the tertiary education level were financial challenges to allow attendance of online classes, incomplete curriculum, fear of contracting the COVID-19 virus, loss of interest in schooling, loss of peers interaction/relationship, loss of classroom interaction significantly disrupted learning, increased crime rate, increased online crimes, lack of access to education, lack of gadget to access e-learning in the rural areas, learning loss for students, mental/medical shock/

depression, missed online classes due to lack of data/phones/radio/television and students not digitally inclined. From the parent's perspective, there was an increase in child labour and in the rate of out of school children. Globally, this aligns with findings from extant students (Hoofman and Secord, 2021; Ihm et al., 2021; Pokhrel and Chhetri, 2021), that children’s emotional setback triggered learning retrogression among children during the pandemic. Figure 3f provides the visualisation network that highlights the connectivity. At the home-front, respondents reported that there was an increase in child labour and rate of out-of-school children

We identified interconnected and filtered shocks, including the moral hazard of online learning, teachers' teamwork and communalism affected, interrupted learning activities/closures of schools, lack of administration, lack of basic skills for online learning, paralysed education sector, lack of assessment, inability to provide quality education, difficulty paying teachers’ salaries, difficulties delivering curriculum, exposure of the weak educational system in Nigeria, management underrated budget allocation for shocks, mass failure, rude shock/unpreparedness by regulatory bodies, and shortage of human resources. Global literature provides insights into how school environments, facilities, and stakeholders experienced shocks at different dimensions (Hoofman and Secord, 2021; Pokhrel and Chhetri, 2021;). Figure 3g provides the visualisation network that highlights the connectivity.

Figure 3f: Network Diagram Showing Tertiary Level Students Related Educational Shocks During Covid-19 Crises

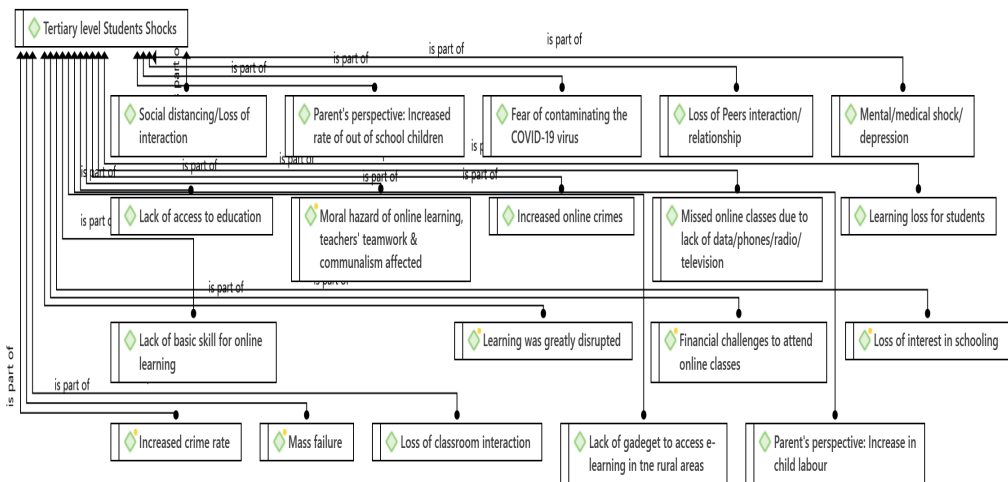
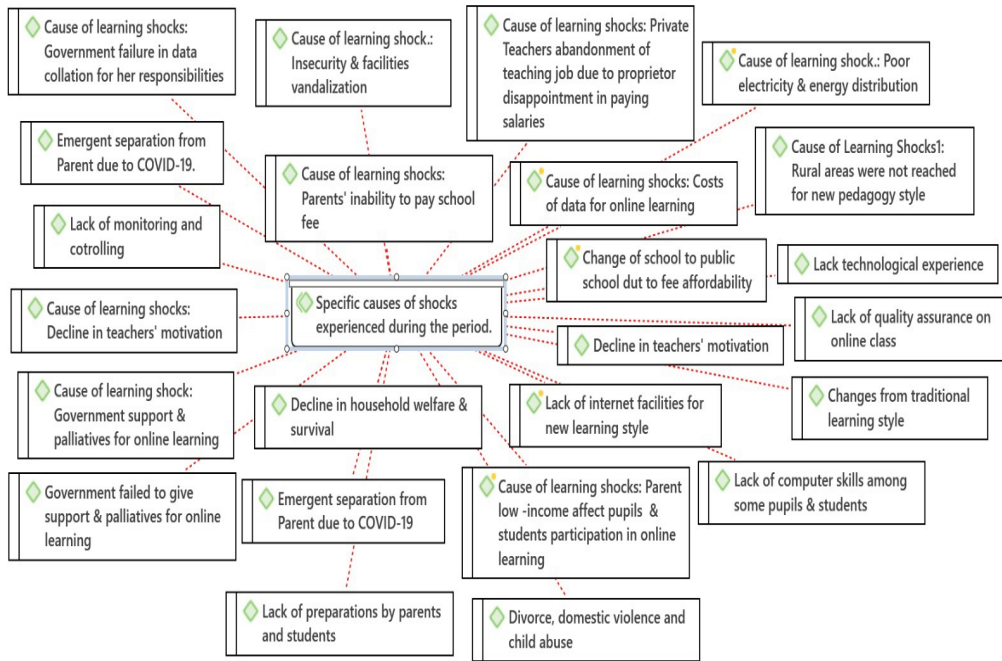


Figure 3g: Network Diagram Showing Tertiary Level Management Related Educational Shocks During COVID-19 Crises



Specific causes of shocks experienced during the period

Our paper provides answers to the question about the specific causes of the educational setback experienced within the study areas, namely Osun, Abuja and Port Harcourt, Nigeria, during the pandemic. In the first coding round, we identified 51 codes that described the impacts. The subsequent screening revealed repetition that called for code merging. Eventually, 47 emerged. Figure 4a and 4b highlight the visualisations of the filtered sub-themes, which include uneven distribution of new learning facilities during COVID-19, the decline in teachers' motivation, parents' reluctance to bring children to school, uneven distribution of new learning facilities during the pandemic, poor electricity and energy distribution, lack of computer skills among some pupils and students, long stay at home, teachers, pupils and students' socio-emotional trauma, and the difficulty for parents and pupils/students to adapt or be flexible to changes in online learning. Other consequences of shocks include divorce, domestic violence and child abuse, government failure to give support and palliatives for online learning, lack of Internet facilities for new learning style, parents low-income affecting pupils' and students' participation in online class learning, teachers abandon teaching careers for trading businesses, change of school to public school due to fee affordability, the decline in household welfare and survival, emergent separation from parents due to COVID-19, growing waves of crimes and insecurity, long stay at home, parent frustration in keeping their children, private

teachers abandon teaching jobs as proprietors fail to pay salaries, the death of parents, the conflicting interest of government tiers, failing local government duties, necessary support and materials not being provided during COVID-19, high costs of data for online learning, the decline in teachers' motivation, no commitment to e-learning, rural areas were not being reached for new pedagogy style, changes from traditional learning style, lack of monitoring and controlling, lack of preparation by parents and students, lack of quality assurance in the online class, and restrictions.

Figure 4a: Network Diagram Showing the Specific causes of shocks experienced during the period

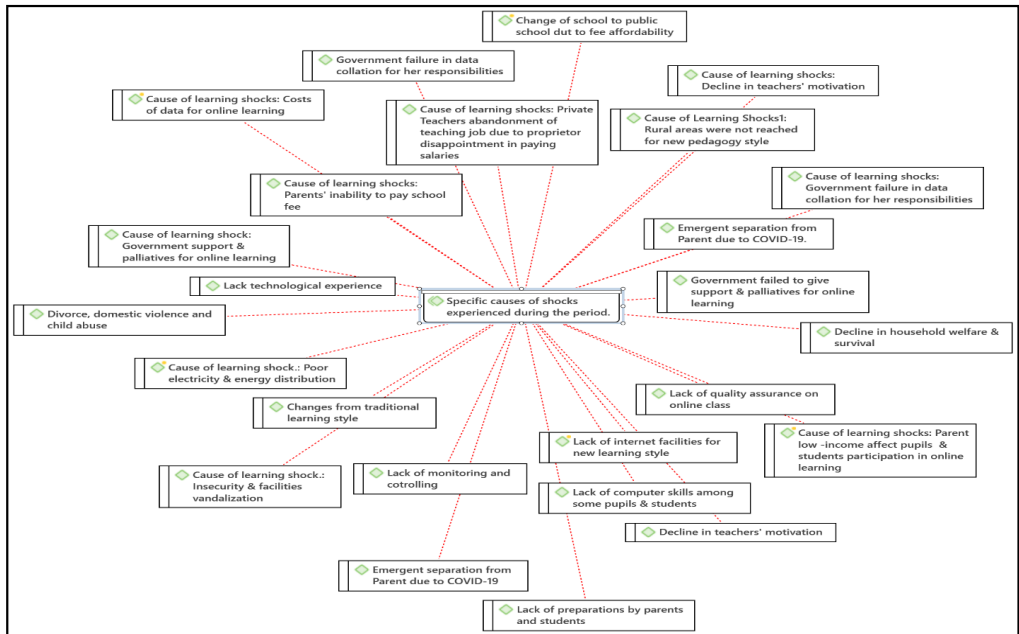
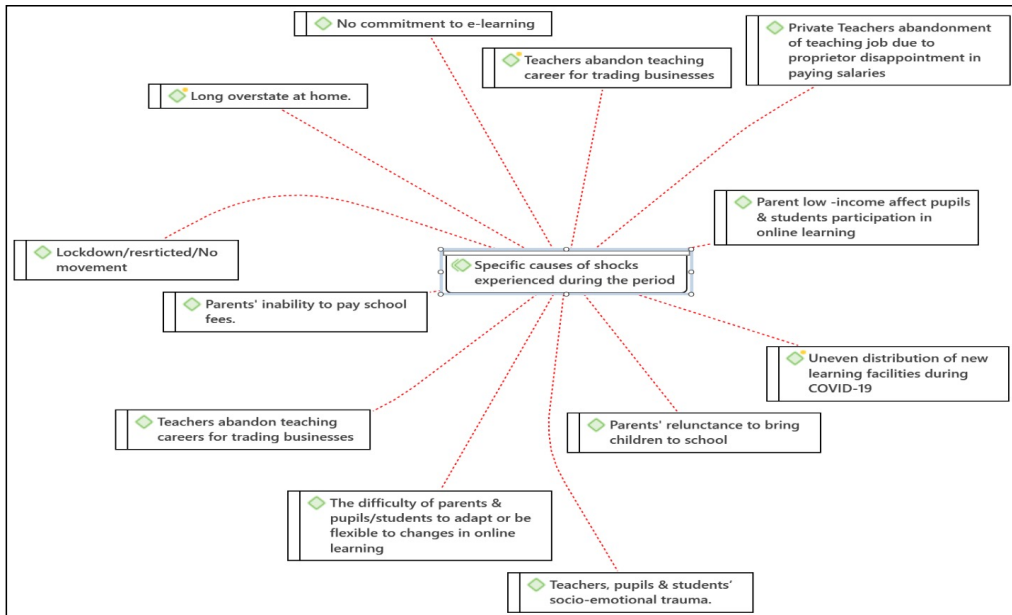


Figure 4b: Network Diagram Showing the Specific causes of shocks experienced during the period



Mitigating strategies

Several mitigating strategies were recommended for instant implementation during and after the COVID-19 lockdown, including adhering strictly to the implementation of handwashing and mouth covering, adopting online pedagogical approaches, embracing batch-by-batch excursion/cut down in the number of students in classrooms, prudent use of allocated budget, creating a proactive mechanism for the adoption and continuation of e-learning approach through capacity building and CPD and building more/improved infrastructure. Some of these measures were not peculiar to the developing contexts, as many countries in the Global South also employed them (OECD, 2020). However, there are contextual differences in the implementation and uptake of measures to mitigate the effect of lockdown. From our analysis, we found out that the Nigerian government’s commitment to creating conducive environment and supporting community intervention to mitigating the effect of lockdown was low. The findings revealed that the principles of inclusion and equity had not been given adequate consideration within the educational provision at all levels. The expected mitigating strategies to address the particular shocks from COVID-19 in Nigeria could be creating smart schools, implementing an equity-informed social protection programmes, employing more teachers, investing in ICT, and increasing investment in infrastructures through public-private partnerships.

E-learning strategies and challenges

The outbreak of COVID-19 led to the adoption of the digital learning approach. The output of the thematic analysis revealed three related strategies: mass media (such as television, radio etc.), the internet and social media (such as WhatsApp); and virtual platforms (Zoom and other apps). Figure 5a and 5b highlight the visualisations of the filtered sub-themes. The identified challenges were lack of internet facilities for new learning style, lecturers being technically deficient, many distractions during online classes, the moral hazard of online learning, network failures/no network, no smart phones/laptop, no budget for full subscription to Zoom, no conducive environment, power failure, uneven distribution of new learning facilities during COVID-19 and unpreparedness for the shocks.

Figure 5a: Network Diagram Showing the E-Learning Challenges

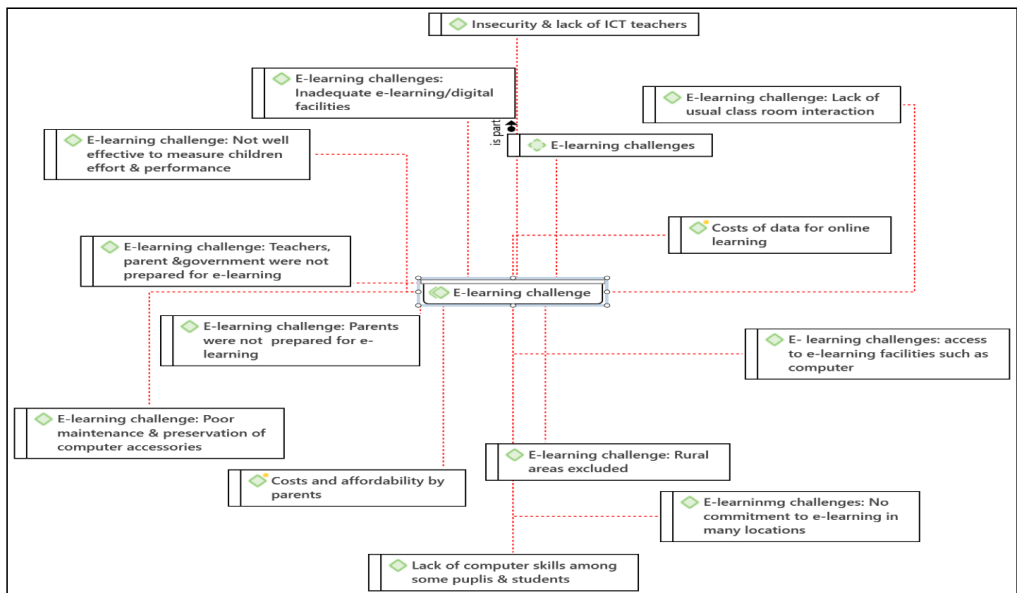
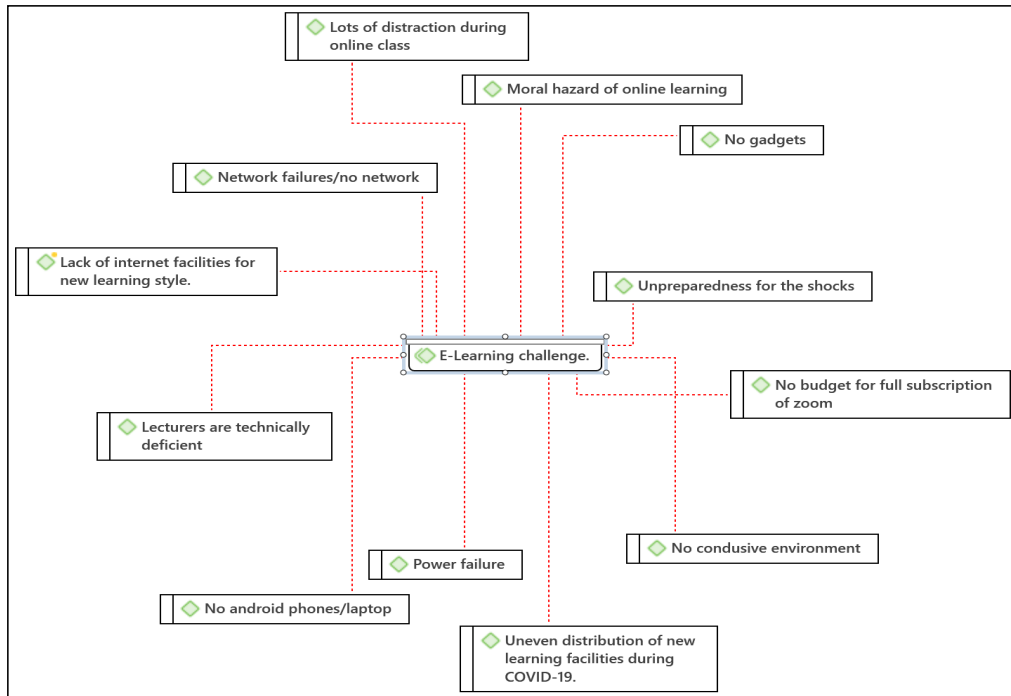


Figure 5b: Network Diagram Showing the E-Learning Challenges



Condition of service and support during COVID-19

The theme provides the narrative of identified gaps and lapses related to the nationwide services and support during the pandemic (Ile-Ife, Abuja and Port Harcourt). In the first coding round, we identified 33 codes that described the loopholes. The subsequent screening revealed repetition that called for code merging. Eventually, 28 codes emerged. Figure 6a and 6b highlight the visualisations of the filtered sub-themes. Generally, the condition of support indicated that there was grossly inadequate readiness to mitigate the missed learning opportunities for learners and the meagre services offered were marred with inequality. Other conditions included home-grown feeding initiatives becoming a means of embezzling funds. Also the initiative did not reach all area and eventually stopped during the lockdown. Inadequate assistance in the form of limited ICT equipment, inadequate support from government in its expected role in ICT provision and inconsistent development of radio programmes to continue learning programme, added to the challenges.

There were various laxities. The palliative services provided during the lockdown were insufficient to cater for the needs of the vulnerable groups- children and women. There was also an evident divide between rural and urban. Due to leadership and governance uncertainty, there was inadequate access to social safety nets, and poor access to vital school services and ICT gadgets for online learning.

Figure 6a: Network Diagram Showing the Condition of Service & Support During COVID-19

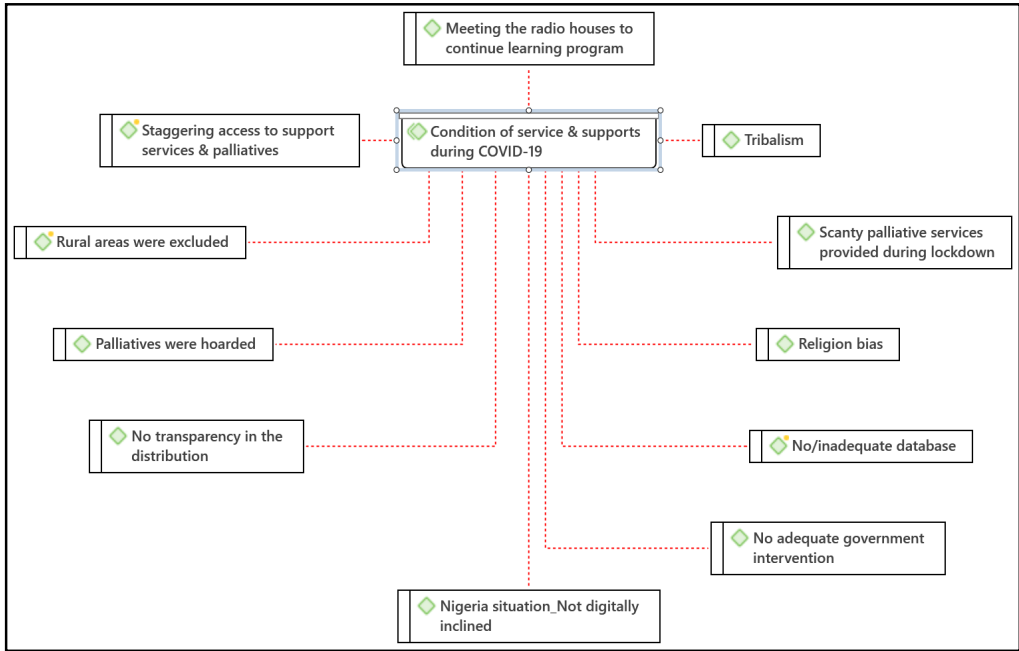
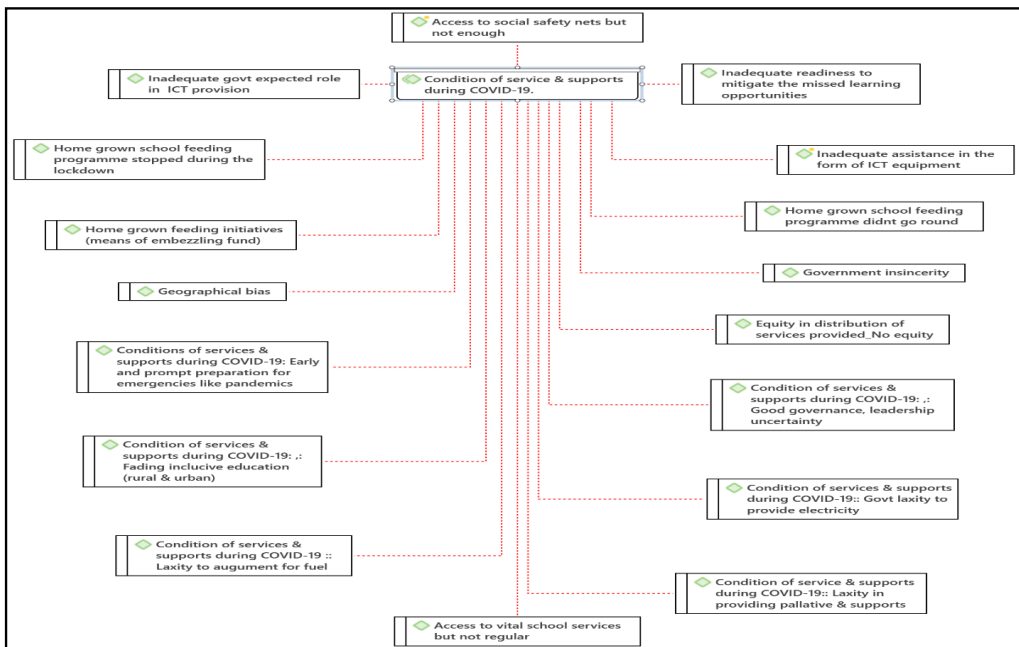


Figure 6b: Network Diagram Showing the Condition of Service & Support During COVID-19



People’s expectations

What are the suggestions and government policy implications for the future? This section questions the gaps and lapses related to the services and support during the pandemic (Ile-Ife, Abuja, and Port Harcourt). Figure 7a, 7b and 7c highlight the visualisations of the filtered sub-themes. The network describes the people's expectations of the government for future policy implication. The expectations are described in three parts in Table 4 government roles, schools’ roles parents' and society roles.

Figure 7a: Network Diagram Showing the Suggestion and the Future Policy Implications

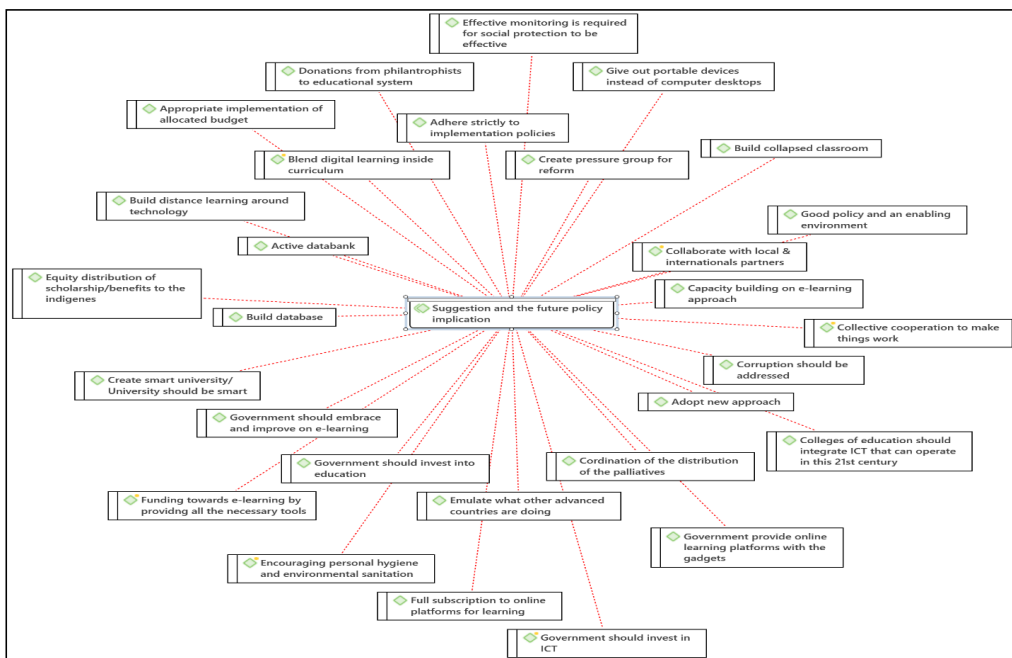


Figure 7b: Network Diagram Showing the Suggestion and the Future Policy Implications

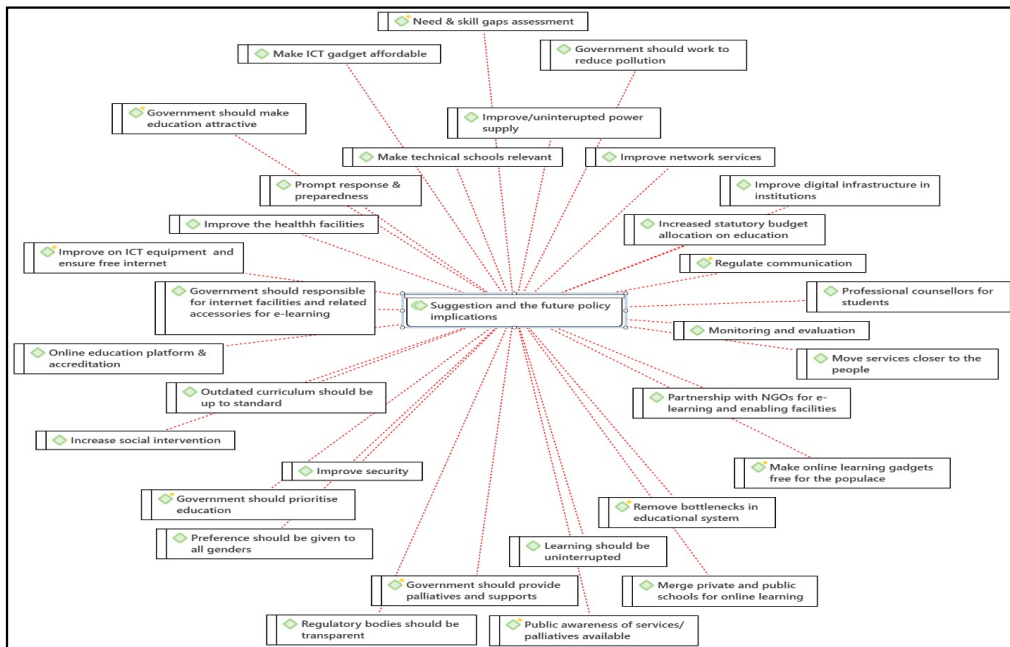


Figure 7c: Network Diagram Showing the Suggestion and the Future Policy Implications

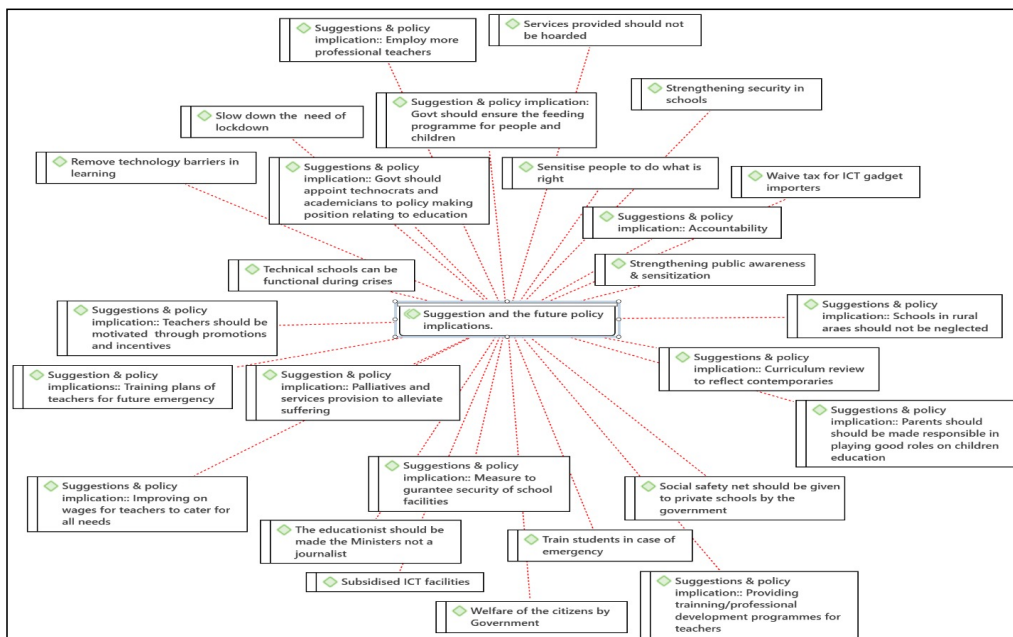


Table 4: People's expectations

Government	Government	Government	Government	Schools	Parents/ Society
Create enabling education policy guided by equity and inclusion	The educationist should be made minister, not a journalist	Need & skill gaps assessment	Embrace and improve e-learning	Partnership with NGOs for e-learning and enabling facilities	Encouraging personal hygiene and environmental sanitation
Corruption should be addressed	Train students in case of emergency	Provide online education platform & accreditation	Develop training plans of teachers for future emergency	Improve access to ICT equipment during the pandemic	Make ICT gadgets affordable
Effective monitoring is required for social protection to be effective	Equity distribution of scholarship/ benefits to the indigene	Regulate communication	Take responsibility for Internet facilities and related accessories for e-learning	Blend digital learning inside the curriculum	Cooperation in making things work
Increased funding/ budget allocation on education	Improved/ uninterrupted power supply	Regulatory bodies should be transparent	Improve access to ICT equipment during the pandemic	Rebuild collapsed classrooms	Create a pressure group for reform
Invest in ICT	Merge private and public schools for online learning	Appoint technocrats and academicians to policy-making positions relating to education	Increase budget and give free Internet	Outdated curriculum should be revised	Accountability
Prioritise education	The social safety net should be given to private schools.	Improving wages for teachers to cater for all needs	Adhere strictly to implementation policies	Develop distance learning around technology before the pandemic	Donations from philanthropies to the educational system
provide palliatives and support.	Coordination of the distribution of the palliatives	Measures to guarantee the security of school facilities	Creating a smart university/ university should be smart	Capacity building on e-learning approach	Sensitise people to do what is right
Consider the need for feeding people and children	Technical schools can be functional during crises	Providing training/ professional development programmes for teachers	Funding towards e-learning by providing all the necessary tools	Collaborate with local & international partners.	Should be made responsible for playing good roles

Public awareness of services/ palliatives available	Subsidised ICT facilities Active databank	Schools in rural areas should not be neglected	Good policy and an enabling environment	Colleges of education should integrate ICT that can operate in this 21st century	Cooperation in making things work
Strengthening public awareness & sensitisation	Waive tax for ICT gadget importers	Teachers should be motivated through promotions and incentives	Monitoring and evaluation	Full subscription to online platforms for learning	
Strengthening security in our schools	Professional counsellors for students	Give out portable devices instead of computer desktops	Should adopt the best practices learnt abroad.	Accountability	
Palliatives and services provided to alleviate suffering	Regulatory bodies need to do the needful	Increase social intervention	Should invest in education	Curriculum review to reflect contemporaries	
Improve network services	Remove bottlenecks in the educational system	Learning should be uninterrupted			
Improve health facilities	Services should not be hoarded	Prompt response & preparedness			

5. Conclusion

The study investigated the differential effects of COVID-19 on the education sector in Nigeria. It revealed specific shocks, causes, mitigating strategies, e-learning and conditions of government support and services. The workshops for stakeholders and the investigational study explored the effects of COVID-19 on education. The events gave stakeholders a place to talk about the different kinds of shocks, their causes, the resilience of education stakeholders (mitigating strategies), the e-learning paradigm, and policy recommendations for Northern, Southern and Western Nigeria. The seminars and research focused on gathering information and making a focused agenda for further research and evaluation of best practices in planning for future contingencies and robust strategies to keep harmful effects on children's and student's education from happening.

The COVID-19 pandemic wreaked havoc on Nigeria's educational system, but, this varied across the country's geopolitical zones. In Nigeria, the epidemic erupted between November and December 2019 and August 2021. The stakeholders' meetings included a kind of focus group that brought together professionals and educational staff, such as teachers and officials, from the ministries of education in Abuja (Federal Capital Territory), Ile-Ife (Osun State), and Port Harcourt (River State). The pilot study results determined the meetings' distribution, which then established that the three locations would provide enough robust and in-depth information regarding the pandemic's effects.

In the same way that the UN framework provides the strategy and plans for the urgent socio-economic responses during COVID-19 to reduce the effects of the pandemic on the most vulnerable people (UNSDG, 2020), this study had a conceptual path leading to policy-informed recommendations. It tries to fix the weak spots and gaps in education (called "shocks") that leave stakeholders open to COVID-19. It also provides a guide to managing future shocks. The response makes us think more deeply about what can worsen learning, teaching and reaching broad educational goals in Nigeria. The framework includes children, students, parents and school-related adversity. It effectively navigates e-learning and obstacles.

Components of the framework experiments' response document examined how COVID-19 affected Nigeria's geopolitical zones. Our idea was based on shocks, specific sources of shocks, the ability of educational stakeholders to recover from shocks (called "mitigating strategies"), and the e-learning paradigm. The framework can also help fill policy and resource gaps when analysing the different effects of COVID-19

at national and international levels. It can also help evaluate other ways to reach important subpopulations.

In partnership with Save the Children and UNICEF, the Nigerian Education Working Group (EiEWG) made a three-point plan to help children and teachers, and to determine funding needs. Our method matches and improves this plan. In other words, our goals for responding to the COVID-19 virus are related to finding setbacks, reasons, new educational paths, and the best ways to open schools again after they have been closed.

COVID-19 had a crucial impact on children's and student's education programmes in Nigeria's education system. Teachers, schools, parents and the administration of higher institutions experienced tremendous devastation. This study determined where most of the shocks affecting children, students, families, schools, the government and teachers originated.

The findings from this study are expected to contribute to current discussions about the effects of negative shocks, such as pandemics and natural disasters or crises on the education system by highlighting unique differences across geographical locations, gender, age groups, education levels and other socio-demographic factors. The findings highlight important implications for improving the preparedness, proactive management and response of the government to shocks or national disruptions.

Throughout the pandemic, the Nigerian education stakeholders, including students and children, demonstrated resilience in implementing the specified survival measures and meeting the needs for the immediate delivery of the following services:

- Using innovative pedagogical strategies
- Conforming carefully to implementation policies
- Adopting batch-by-batch excursions/decreasing the numbers
- Implementing the allotted budget in an acceptable manner
- Being proactive in their pedagogical practices
- Constructing a database for e-learning and other preventive measures
- Increasing and strengthening infrastructure
- Capacity building on the e-learning methodology
- Collaborative efforts to make things function
- Community outlook and government action
- Establishing a conducive environment for learning
- Establishing intelligent universities/universities should be intelligent
- Cancelling holidays
- Conducting home lessons
- Challenging government to provide effective social protection
- Hiring additional educators
- Charging government to emulate what other developed countries do
- Distributing services with equity
- Challenging government to provide sound policies and a hospitable atmosphere
- Challenging government to provide online learning platforms and devices

- Challenging government to invest in ICT
- Challenging government to invest in education
- Challenging government to make education appealing
- Challenging government to provide palliatives and support
- Challenging government to work to reduce pollution
- Challenging government to enhance institutions' digital infrastructure
- Challenging government to upgrade ICT equipment and ensure free Internet
- Challenging government to enhance safety
- Challenging government to improve/provide uninterrupted electricity supply
- Challenging government to increase statutory education budget allocation
- Challenging government to formally introduce e-learning
- Challenging government to make technical schools relevant
- Challenging government to rekindle passion for learning
- Challenging government to bring services closer to the population
- Challenging government to evaluate prerequisites and skill gaps
- Challenging government to supply IT infrastructure and seek funding sources from partners

The speed of the pandemic drove the transition to e-learning pedagogies, such as blended learning or digital learning. The thematic analysis results uncovered three methods: virtual platforms (including Zoom and other apps). The paradigm presented numerous obstacles. Students, parents, instructors, the Ministry of Education and post-secondary institutions were able to stem the flow of the pandemic within a short period by using the techniques indicated.

It is expected that this study's findings will contribute to current discussions about the effects of negative shocks, such as pandemics and natural disasters or other crises, on the education system by highlighting unique differences across geographical locations, gender, age groups, educational levels and other socio-demographic factors. The findings of this study have important implications for improving the preparedness, proactive management and response of the government to shocks or national disruptions in the future.

6. Policy recommendations

The significant implications centred on the policy challenge posed to the legislative, judicial, and executive branches of government regarding the traditional method of preparedness for contingencies and how future proactive government management and response to shocks or national disruptions can be institutionally enhanced.

The following short and long-term policy suggestions were derived from the study:

- i. Reducing inequality in access to digital technologies at all education levels should remain a policy priority among policy makers and pertinent stakeholders in the education sector.
- ii. Government needs to improve on the provision of e-learning platforms in school by making funding available for e-learning projects.
- iii. There is a need to build capacity in e-learning and digital technologies in schools.
- iv. Equity in the distribution and access to e-learning facilities must be enforced in schools.
- v. A proactive approach to preparedness and response to national crises should be adopted across all educational levels.
- vi. Addressing disparities in access to digital technology at all levels of schooling should continue to be a policy goal for policy makers and relevant education sector stakeholders.
- vii. The government must provide financing for e-learning projects to boost the availability of e-learning platforms in schools.
- viii. Capacity building in e-learning and digital technology is required in schools.
- ix. In schools, distribution and access to e-learning resources must be made equitable.
- x. All educational levels should adopt a proactive approach to national disaster planning and response.

Long-term policy recommendations include planning, monitoring, infrastructure development, security, public awareness, sensitisation, training, capacity building, professional development and a focus on parental roles.

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Appendix

Figure 2: The six geo-political zones in Nigeria.





Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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Contact Us

African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org