

# Differential Effects of Emergency Remote Teaching Strategies During COVID-19 Pandemic in Gombe State, Nigeria

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## ABSTRACT

The Covid-19 pandemic has disrupted the lives of millions around the world. In the education sector, schools had to abruptly transition from traditional in-person classes to emergency remote teaching, which presents a unique set of challenges for students, teachers and administrators alike. This research examined the various forms and the differential effects of Emergency Remote Teaching (ERT) strategies that were offered to primary and secondary school students in Gombe State, Nigeria during the COVID 19 pandemic lockdown of educational institutions. The study was guided by four research questions and four hypotheses. The causal comparative and survey research designs were used. The target population were all public and private primary and secondary school teachers in Gombe State, Nigeria. The participants comprised of 493 teachers from 197 schools comprising of 208 (42%) male, and 285 (58%) female was chosen through the multistage stratified random sampling technique. The stages were senatorial zones, local government areas, as well as school ownership (public/private), educational level (primary/secondary) and location (urban/ rural). A questionnaire titled Teacher Experiences on Emergency Remote Teaching Questionnaire (TEERTQ) was used for data collection after undergoing validation and a reliability coefficient of 0.84 obtained. Data were descriptively and inferentially (t-tests) analysed using the SPSS statistical software. The findings indicated the ERT platforms used were Radio, WhatsApp, Zoom, and YouTube. The result further indicated significant difference on the forms of ERT provided based on level, ownership and location. However, no gender differences exist on the forms of ERT provided. Based on the results, it was recommended that in order to prepare for future disruptions and minimize the negative impact of school closures on student learning, robust continuous learning strategies and high-quality remote learning policies should be developed and implemented to ensure that all students have equal access to remote learning opportunities and resource as well as maintain the standard of education delivery.

**Keywords:** emergency remote learning, covid-19, education, teaching strategies

## INTRODUCTION

The Coronavirus Disease 2019 (COVID-19), caused by the novel coronavirus SARS-CoV-2, emerged as a severe respiratory illness that rapidly spread across the globe. First reported to the World Health Organization (WHO) on December 31, 2019, in Wuhan, China, the virus's transmission escalated at an alarming rate through person-to-person contact. By March 11, 2020, the WHO declared COVID-19 a public health emergency of international concern (NCDC, 2020). As of May 31, 2023, there have been 767,364,883 confirmed cases and 6,938,353 deaths globally due to COVID-19 (WHO, 2023). The disease, currently without a known cure, is managed through treatments aimed at alleviating symptoms.

In Nigeria, the first confirmed COVID-19 case was reported on February 27, 2020. In response, the Federal Government mandated the closure of educational institutions to curb the virus's spread. Following this directive, the Gombe State Executive Council closed all primary, secondary, and tertiary institutions from March 24, 2020. This closure persisted until September 2020, when students in terminal examination classes—Primary 6, JS3, and SS3—were permitted to return, followed by the gradual return of other students.

This disruption in education raised significant concerns about increasing the number of out-of-school children and exacerbating existing educational inequalities. Nigeria already ranks high globally for out-of-school children, with one in five of the world's out-of-school children residing in the country (UNICEF, 2018). Specifically, Gombe State, with an estimated population of 3.2 million, has over half a million out-of-school children, representing nearly 6% of Nigeria's 10.3 million out-of-school children (Daily Trust, n.d.).

The COVID-19 pandemic necessitated a shift to Emergency Remote Teaching (ERT) as the only feasible alternative for continuing education. ERT, distinct from traditional remote education, involves a temporary shift of instructional delivery to remote methods due to crisis circumstances (Anthony & Noel, 2021). This approach relies on digital tools, such as video conferencing and online platforms, to facilitate learning. In Gombe State, initiatives included radio lessons in basic subjects broadcasted on Amana FM and Gombe Media Corporation (GMC). Additionally, the Strengthening Education in North East Nigerian States (SENSE) project introduced Transactional Radio Instruction (TRI) Mu Karanta on Progress FM, supported by the United States Agency for International Development (USAID).

Despite these efforts, the implementation of ERT raises questions about the inclusivity and quality of education. Many learners in Gombe State lack access to essential facilities such as electricity, radios, televisions, computers, and the internet. Children from rural areas and low socioeconomic backgrounds often lack the supportive home environments needed for effective learning. Special consideration is required for students with disabilities, those in refugee camps, and other marginalized groups who were already facing educational challenges prior to the pandemic.

This study explores the differential effects of ERT strategies during the COVID-19 pandemic in Gombe State, Nigeria. It examines whether these strategies have inadvertently created new forms of educational discrimination and widened existing inequalities. The study seeks to identify how non-discriminatory, effective learning can be sustained during such crises and what strategies can ensure equitable educational opportunities in future emergencies.

### **Problem Statement/ Justification**

As a fallout of the outbreak of COVID-19, schools were forced to close and students have had to transition to some forms of online learning. This has created an immense challenge for Nigerian teachers and students alike as they struggle with access, technology, resources and support needed for successful education. A study on emergency remote teaching in Gombe state, Nigeria would help provide valuable insight to better understand issues regarding digital infrastructure, teacher training needs and student engagement strategies vis-à-vis the differential effects across variables like age, gender, parents' socioeconomic status, school ownership status, special educational needs and location (urban-rural dichotomy).

Particularly, the study would help identify potential solutions that can be implemented as well as provide long-term guidance on how best to leverage technology in order maximize educational outcomes. For example, it could uncover opportunities where existing technologies or platforms can be utilized more effectively or new ones developed that are better suited towards meeting specific objectives within the local contexts of Gombe state as well as across different regions of Nigeria. Such information will not only benefit those directly involved but also inform policy makers when making decisions about which initiatives should receive greater attention going forward so as ensure equitable access quality education regardless of location or socioeconomic status.

Consequently, conducting research specifically tailored towards addressing challenges related to Emergency Remote Teaching (ERT) in Nigeria provides an opportunity to understand unique cultural elements at play which may influence adoption rates among both teachers and learners thus allowing us tailor interventions accordingly leading to improved overall academic performance in Gombe state. This type data will invaluablely help in shaping future policies and regulations governing use educational technologies within the school system in Gombe state thereby ensuring maximum benefit to all stakeholders involved including government administrators, educators, parents and most importantly children themselves who ultimately gain most from any improvements made in these areas moving forward.

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## Theoretical Framework

This study was premised on the advocacy of Michael Simonson Equivalency Theory. The equivalency theory advocates that distance education (in the case of this study- emergency learning opportunities provided during COVID 19 school shut down) is not identical to traditional education, but it is equivalent. The basis for Simonson's equivalency theory is that learning experiences should be equivalent, rather than identical regardless of whether the learner is in a traditional or distant setting (Simonson et al, 2011). This theory acknowledges that although remote learning and face-to-face learning are two different delivery formats, and in some cases, there is no way to have an exact, equal, copy of the face-to-face learning design for remote learning opportunities. But, the same level of quality and learning opportunities should be offered, regardless of the delivery. Based on that, in order for the remote learning opportunities to meet the highest quality standards of educational design and delivery, they should provide an equivalent learning experience to the face-to-face course. This should be completed even if done differently since remote delivery requires alternative approaches to teaching and learning practices. This theory helps to eliminate the try and error approach to remote learning such that firm decisions are made even in the case of COVID-19 lockdown.

## Purpose of the Study

The overall purpose of the study was to empirically document the various forms of emergency remote teaching strategies (ERT) that were offered to primary and secondary school students in Gombe State, Nigeria during the COVID-19 pandemic lockdown of educational institutions as well as examine their differential effects. The specific objectives were to:

1. identify the various forms of ERT provided in Gombe State during COVID 19 lockdown.
2. find out the qualities of the ERT provided.
3. identify the challenges encountered by teachers in the provision of ERT.
4. investigate the various forms of ERT provided in Gombe State during COVID 19 lockdown based on school level.
5. investigate the various forms of ERT provided in Gombe State during COVID 19 lockdown based on school ownership.
6. investigate the various forms of ERT provided in Gombe State during COVID 19 lockdown based on school location.
7. investigate the various forms of ERT provided in Gombe State during COVID 19 lockdown based on gender.
8. suggest to policymakers and other relevant stakeholders evidence-based policies and strategies that can be put in place in any future similar occurrence.

## Research Questions

The following research questions guided the focus of this study,

1. What are the various forms of ERT provided in Gombe State during COVID 19 lockdown?
2. What are the qualities of the ERT provided?
3. What were the challenges encountered by teachers in the provision of ERT?
4. What policies and strategies can be put in place in any future similar occurrence?

## Hypotheses

H<sub>01</sub>: There is no significant difference between primary and secondary schools on the forms of ERT used during COVID 19 lockdown in Gombe State.

H<sub>02</sub>: There is no significant difference between public and private schools on the forms of ERT used during COVID 19 lockdown in Gombe State.

H<sub>03</sub>: There is no significant difference between urban and rural schools on the forms of ERT used during COVID 19 lockdown in Gombe State.

Ho<sub>4</sub>: There is no significant difference between male and female teachers on the forms of ERT used during COVID 19 lockdown in Gombe State.

## LITERATURE REVIEW

### The Concept of Emergency Remote Teaching

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, prompted unprecedented disruptions across various sectors globally, including education. Governments worldwide, including Nigeria, implemented emergency measures to curb the spread of the virus, leading to the closure of educational institutions. This necessitated a rapid transition to emergency remote teaching (ERT) strategies.

ERT refers to the temporary shift of instructional delivery to an alternate mode due to crisis circumstances, utilizing fully remote solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated (Hodges et al., 2020). Ikwuka, Okoye, Olanikawu, Udenwa, Okoye and Ikwuka (2021) observed that it is an interim switch in the method of delivering instruction due to a crisis. It necessitates the use of entirely remote teaching solutions for instruction, which will be restored after the crisis passes. Normally, instruction would be provided in-person or through blended or hybrid learning environments. Unlike planned online education, ERT is a response to a sudden crisis, and therefore, often lacks the pedagogical preparation and infrastructure of traditional online education.

Globally, the pandemic led to the closure of schools in 190 countries, affecting 1.6 billion students (UNESCO, 2020). The shift to remote learning highlighted significant disparities in access to technology and the internet, which are critical for successful online learning. Countries with robust digital infrastructures managed the transition more smoothly compared to those with limited resources.

Before the pandemic, Nigeria's education system already faced significant challenges, including inadequate infrastructure, overcrowded classrooms, and a high rate of out-of-school children (UNICEF, 2018). The country's digital divide further worsened these issues during the shift to ERT. In response to school closures, the Nigerian government, alongside various educational institutions, implemented several strategies to continue education remotely. These included online classes, radio and television broadcasts, and distribution of printed learning materials (Obiakor & Adeniran, 2020). However, the effectiveness of these strategies varied widely across different regions and socioeconomic groups.

Gombe State, located in the northeastern region of Nigeria, reflects a small-scale version of the national challenges faced in implementing ERT. The state's educational system is characterized by a mix of urban and rural settings, each with distinct challenges and resources. One of such challenges is access to technology and the internet, which is considered a significant determinant of the success of ERT. In Gombe State, a substantial digital divide exists between urban and rural areas. Urban areas tend to have better access to electricity and internet services, while rural areas often lack these basic infrastructures (Bashir, Yusuf & Abdullahi, 2021). This disparity affects students' ability to participate in online learning.

The implementation of ERT tend to highlight differences between public and private schools in Nigeria. Private schools, generally better resourced, have more swiftly adopted digital tools and platforms for remote teaching. These schools often had pre-existing infrastructure and a higher likelihood of students having access to necessary technology, such as computers and reliable internet connections (Olapegba et al., 2020). Conversely, public schools, particularly those in rural areas, faced significant challenges, including a lack of technological infrastructure and limited access to digital devices (Akinbobola, 2021). According to a study by Omodan and Ige (2021), private schools were more likely to continue with academic activities during the lockdown, whereas many public schools struggled to maintain regular teaching schedules. This disparity has likely widened the educational gap between students in public and private schools, with private school students receiving more consistent and higher-quality education during the pandemic.

ERT also tend to vary significantly between primary and secondary schools. Secondary school students, generally more autonomous and technologically savvy, adapted more readily to remote learning compared to younger primary school students, who require more guidance and support (Olayemi, 2020). Primary school teachers faced the added challenge of needing to design engaging, age-appropriate content that could be delivered remotely, a task that is considerably more complex than for secondary education (Adebayo, 2020). Adeoye et al. (2020) equally noted that secondary schools were more likely to have the necessary infrastructure for ERT, such as digital devices and internet access. In contrast, primary schools, particularly in rural areas, often lacked these resources, making the transition to remote teaching more problematic. Additionally, secondary school curricula, with their emphasis on standardized testing and examination preparation, provided a clearer framework for remote learning compared to the more flexible and varied primary school curricula.

Gender dynamics also tend to influence ERT. Female teachers, who often bear a disproportionate share of domestic responsibilities, faced unique challenges in balancing work and home life during the pandemic. Research by Fapohunda (2021) indicates that female teachers were more likely to report higher levels of stress and burnout compared to their male counterparts. Additionally, female teachers in Nigeria are less likely to have the same level of access to digital tools and training as male teachers, which further hampers their ability to deliver effective remote instruction (Adeoye, Adanikin, & Adanikin, 2020). A study by Oluwafemi and Olufunke (2021) found that male teachers were more likely to adopt and integrate new technologies in their teaching practices compared to female teachers, who faced more significant barriers to accessing and utilizing digital platforms. These challenges are compounded by existing gender inequalities in the education sector, making it more difficult for female teachers to adapt to the demands of ERT.

## METHODOLOGY

The causal comparative (expost-factor) and survey research designs were used for the study. The target population were all public and private primary and secondary school teachers in Gombe State, Nigeria. The sample was 384 teachers selected through the multistage stratified random sampling technique. The stages were senatorial zones, local government areas, as well as school ownership (public/private), educational level (primary/ secondary) and location (urban/ rural). In the first stage, two local governments were selected/ chosen at random from each of the three senatorial zones in Gombe State. In all, 6 out of the 11 local government areas of the state formed part of the study. In the second stage, schools in the chosen local government areas were stratified based on ownership status (private/public), educational level (primary, junior secondary and senior secondary) and location (urban/ rural). From each of these strata, 30% of schools were chosen at random, in addition, all schools that provided education for special need learners were purposively chosen. In the third stage, 10% of the teachers from each of the chosen schools were chosen at random with the assumption that the variable of gender was adequately and fairly represented the distribution in the population.

A researcher-developed questionnaire titled Teacher Experiences on Emergency Remote Teaching Questionnaire (TEERTQ) was used for data collection. The researchers were guided in developing the instrument by literature and empirical studies that addressed the study's variables. The questionnaire had two sections: Section A: Socio-demographic characteristics of respondents, such School Name, location, type, ownership, level, gender, educational and employment status, Section B comprised items that assessed the types of ERTLs provided, their quality and characteristics, and challenges. Experts were consulted to ensure the questionnaire's validity. A Cronbach Alpha reliability test was also performed after administering the instrument to individuals with identical characteristics from outside Gombe state. A reliability coefficient of 0.84 was obtained, which is considered satisfactory for a reliable instrument. Collated data was cleaned and analysed through quantitative both descriptively (mean and standard deviation) and inferentially (t-tests) using the SPSS statistical software.

## RESULTS AND DISCUSSION

The results are hereby presented according to the research questions and hypotheses.

### Research Questions

RQ1: What are the various forms of ERT provided in Gombe State during COVID 19 lockdown?

Table 1: Descriptive statistics of the various forms of ERT provided in Gombe State during COVID 19 lockdown

S/N	Item	Frequency	Percentage of Response	Decision
1.	Google Classroom	84	17.04	Not Well Provided
2.	Microsoft Teams	31	6.29	Not Well Provided
3.	WhatsApp	322	65.31	Well Provided
4.	Google Meet	39	7.91	Not Well Provided
5.	Facebook	207	41.99	Not Well Provided
6.	Zoom	297	60.24	Well Provided
7.	Interactive White Board	43	8.72	Not Well Provided
8.	Radio	490	99.39	Well Provided
9.	Google Hangout	53	10.75	Not Well Provided
10.	Skype	103	20.89	Not Well Provided
11.	Voice over PowerPoint	35	7.10	Not Well Provided
12.	YouTube	282	57.20	Well Provided
13.	Moodle	12	2.43	Not Well Provided

The first question sought to find out the various forms of ERT provided in Gombe State during COVID 19 lockdown. A frequency analysis was conducted to determine the provision of each emergency remote learning strategy. Data in Table 1 from the 493 respondents showed that educational media such as WhatsApp, Zoom, Radio and YouTube were well utilized as indicated in items 3, 6, 8 and 12, while the rest such as Google classroom, Microsoft Teams, Google Meet, Facebook, Zoom, Interactive White Board, Google Hangout, Skype, Voice over PowerPoint, and Moodle were not well utilized as indicated in items 1, 2, 4, 5, 7, 9, 10, 11 and 13 respectively.

RQ2: What were the qualities of the ERT provided?

Table 2: Descriptive statistics on the qualities of ERT provided in Gombe State during COVID 19 lockdown

S/N	Item	Mean	SD	Decision
1.	Relevance	3.23	0.57	Accepted
2.	Appropriateness	3.04	0.32	Accepted
3.	Infrastructure and Technology	2.45	0.44	Rejected
4.	Teacher Preparedness	1.97	0.76	Rejected
5.	Student Engagement	1.28	0.22	Rejected
6.	Curriculum Adaptation	1.20	0.22	Rejected
7.	Communication and Feedback	1.36	0.56	Rejected

8.	Assessment and Evaluation	1.76	0.19	Rejected
9.	Equity and Inclusion	2.03	0.66	Rejected
10.	Time Management	3.55	0.82	Accepted
11.	Parental Involvement	2.84	0.54	Accepted

The second research question sought to find out the quality of the ERT provided. To do this, a mean and standard deviation for each of the items was computed on a scale of 1 to 5. A mean score of 2.5 and above for any of the items was considered accepted, while 2.49 and below were rejected. The analysis on Table 2 showed that of the 12 qualities of ERT, only 4 were said to have been met as stated by the respondents. They are relevance, appropriateness, time management and parental involvement.

RQ3: What were the challenges encountered by teachers in the provision of ERT?

Table 3: Descriptive statistics of challenges encountered by teachers in the provision of ERT in Gombe State during COVID 19 lockdown

S/N	Challenge encountered	Mean	SD	Decision
1.	Limited Access to Technology	3.46	1.02	Accepted
2.	Inadequate Infrastructure	3.70	0.94	Accepted
3.	High cost of data for Internet subscription	2.66	0.34	Accepted
4.	Poor internet services	3.00	0.67	Accepted
5.	Inadequate electricity supplies	3.25	0.20	Accepted
6.	Lack of smart device (phone, laptop, tablet)	2.38	0.45	Rejected
7.	Technical issues like poor internet connectivity	3.50	0.81	Accepted
8.	Lack of motivation for independent learning	1.90	0.33	Rejected
9.	Lack of necessary digital literacy skills	3.12	0.72	Accepted
10.	Lack of face-to-face interaction	2.80	0.50	Accepted

Research question three sought to find out the challenges encountered by teachers in the provision of ERT. Like with question two, a mean and standard deviation for each of the items was computed on a scale of 1 to 5 with a mean score of 2.5 and above as accepted, while 2.49 and below were rejected. The analysis on Table 3 indicated the challenges as limited access to technology, inadequate infrastructure, high cost of data for internet subscription, poor internet services, technical issues like poor internet connectivity, lack of necessary digital skills and lack of face-to-face interaction.

RQ4: What policies and strategies can be put in place in any future similar occurrence?

Table 4: Descriptive statistics of the policies and strategies to be put in place in any future similar occurrence

S/N	Item	Mean	SD	Decision
1.	Investment in Infrastructure	3.70	1.00	Accepted
2.	ICT Integration in Education	4.52	0.98	Accepted
3.	Curriculum Development	2.15	0.52	Rejected
4.	Equitable Access	3.88	0.70	Accepted

5.	Teacher Training	4.00	0.34	Accepted
6.	Technical Support	3.45	0.63	Accepted
8.	Curriculum Adaptation	2.39	0.50	Rejected
9.	Collaboration and Networking	3.90	1.03	Accepted
10.	Public-Private Partnerships	4.61	0.80	Accepted

To answer the fourth research question on policies and strategies that can be put in place in any future similar occurrence, a mean and standard deviation was also computed on a scale of 1 to 5 with a mean score of 2.5 and above as accepted, while 2.49 and below were rejected. The analysis on Table 4 provided the suggestions as investment in infrastructure, ICT integration in education, equitable access, teacher training, technical support, collaboration and networking and public-private partnerships.

**Hypotheses**

H1: There is no significant difference between primary and secondary schools on the forms of ERT used during COVID 19 lockdown in Gombe State.

Table 5: Result of t-test on ERT used in Primary and Secondary Schools

Group	N	$\bar{x}$	SD	T	df	p-value	Decision
Primary	366	3.57	0.67	2.78	491	0.03	Significant
Secondary	127	4.12	0.72				

To test for significant difference between primary and secondary schools on the forms of ERT provided during the COVID-19 lockdown in Gombe state, a t-test statistic was computed. From the result on Table 5, there was a computed p-value of 0.03. In addition, the means for primary schools was 3.57, while the means for secondary schools was 4.12. This provided sufficient evidence against the null hypothesis, hence it is rejected. Therefore, there is significant difference between primary and secondary schools on the forms of ERT provided during the COVID-19 lockdown in Gombe state.

H2: There is no significant difference between public and private schools on the forms of ERT used during COVID 19 lockdown in Gombe State.

Table 6: Result of t-test on ERT used in Public and Private Schools

Group	N	$\bar{x}$	SD	T	df	p-val	Decision
Public	198	3.00	0.24	1.54	491	0.04	Significant
Private	295	3.98	0.50				

To test for significant difference between public and private schools on the forms of ERT provided during the COVID-19 lockdown in Gombe state, a t-test statistic was computed. From the result on Table 5, there was a computed p-value of 0.04. In addition, the means for public schools was 3.00 while the means for private schools was 3.98. This provided sufficient evidence against the null hypothesis, hence it is rejected. Therefore, there is significant difference between public and private schools on the forms of ERT provided during the COVID-19 lockdown in Gombe state.

H3: There is no significant difference between urban and rural schools on the forms of ERT used during COVID 19 lockdown in Gombe State.



Table 7: Result of t-test on ERT used in Urban and Rural Schools

Group	N	$\bar{x}$	SD	T	Df	p-value	Decision
Urban	177	4.08	0.54	3.65	491	0.01	Significant
Rural	316	2.43	0.86				

A t-test statistic was used to determine whether there was a significant difference between urban and rural schools in the types of ERT delivered during Gombe state's COVID-19 lockdown. Table 5 showed a computed p-value of 0.01. Furthermore, the mean for urban schools was 4.08, while the mean for rural schools was 2.43. This supplied sufficient evidence against the null hypothesis, thus it was rejected. As a result, the kind of ERT offered during Gombe state's COVID-19 lockdown varies significantly between urban and rural schools.

H4: There is no significant difference between male and female teachers on the forms of ERT used during COVID 19 lockdown in Gombe State.

Table 7: Result of t-test on ERT used by Male and Female Teachers

Group	N	$\bar{x}$	SD	T	df	p-value	Decision
Male	208	3.33	0.31	2.06	491	0.08	Not Significant
Female	285	3.50	0.55				

A t-test was used to see whether there was a significant difference between male and female teachers in the types of ERT offered during the COVID-19 lockdown in Gombe state. The computed p-value for the results in Table 5 was 0.08. In addition, the means for male and female teachers were 3.33 and 3.50, respectively. This supplied insufficient evidence against the null hypothesis, thus it was retained. As a result, there is a no significant difference between male and female teachers in the kind of ERT provided during the COVID-19 lockdown in Gombe state.

## DISCUSSION OF FINDINGS

The study aimed to explore the differential effects of emergency remote teaching (ERT) strategies that were offered to primary and secondary school students in Gombe State, Nigeria during the COVID 19 pandemic lockdown of educational institutions. The study found the most utilised ERT platforms were Radio, WhatsApp, Zoom, and YouTube. This reflects similar findings globally where a combination of low-tech and high-tech solutions were employed to mitigate the impact of school closures. Radio and WhatsApp platforms were particularly effective in regions with limited access to advanced technology and internet infrastructure. Radio, being widely accessible, served as a critical tool for delivering educational content, particularly in rural areas. WhatsApp, a widely used communication app, facilitated teacher-student interactions and the distribution of learning materials. Zoom and YouTube platforms, which were more commonly used in urban areas with better internet connectivity enabled real-time interaction between teachers and students, mimicking face-to-face classroom settings. YouTube provided a repository of educational videos that students could access asynchronously.

The study assessed the quality of ERT based on relevance, appropriateness, time management, and parental involvement, aligning with findings from other regions. The ability to deliver content that was both relevant and appropriate to students' learning needs was crucial. This aligns with research by Bao (2020), which emphasized the importance of tailored content to maintain student engagement and ensure educational continuity. Effective time management was necessary to balance screen time and prevent burnout, a concern highlighted in König et al.'s (2020) study on teacher competence in remote settings. Increased parental

involvement was a key factor in successful ERT, as noted in Adebayo and Abdulhamid (2020). Parents played a critical role in facilitating their children's learning, especially for younger students.

The study identified several challenges encountered by teachers in Gombe State in the provision of ERT which include limited access to technology, inadequate infrastructure, high cost of data for internet subscription, poor internet services, technical issues like poor internet connectivity, lack of necessary digital skills and lack of face-to-face interaction. These results are consistent with those reported in the literature. Research by Dong, Cao, and Li (2020) similarly highlighted infrastructure deficits as a major barrier to effective remote learning. The economic burden of data costs and unreliable internet connectivity were significant impediments as noted in Di Pietro, Biagi, Costa, Karpiński and Mazza (2020), emphasizing the need for affordable and reliable internet access. Findings of König, Jäger-Biela, and Glutsch (2020) also indicated that teachers struggled with technical problems and often lacked the necessary digital skills to effectively use ERT platforms. They stressed the importance of digital competence for teachers.

The study revealed significant differences in the forms of ERT provided based on educational level (primary vs. secondary), school ownership (public vs. private), and location (urban vs. rural). Secondary school students generally had better access to digital learning tools compared to primary school students. This is consistent with findings that older students are more likely to have the digital literacy skills needed for online learning (Afolabi, Fagbohun, & Olaniran, 2021). Also, private schools were better equipped to transition to online learning due to better resources and infrastructure, echoing the disparities reported by Obiakor and Adeniran (2020).

On location, Bashir et al. (2021) found that urban schools had more access to technology and internet services than rural schools, reflecting the digital divide highlighted in both local and international studies. However, the study found no significant gender differences in the forms of ERT provided. This suggests that the barriers and facilitators of remote learning were similarly experienced by both male and female students, which contrasts with some global studies that have reported gender-specific challenges (UNESCO, 2020). However, it indicates progress towards gender equity in access to education in this context.

On policies and strategies that can be put in place in any future similar occurrence, the suggestions included investment in infrastructure, ICT integration in education, equitable access, teacher training, technical support, collaboration and networking and public-private partnerships. These recommendations for future policies and strategies are well-supported by the empirical literature. Dong et al. (2020) noted that addressing infrastructure deficits is crucial for equitable access to remote learning, (UNESCO, 2020) posited that embedding ICT in the educational system is necessary for preparedness in future crises, aligning with global calls for enhanced digital education, Di Pietro et al. (2020) suggested that ensuring all students, regardless of socioeconomic status or location, have access to learning resources is a priority, while König et al. (2020) highlighted that continuous professional development and technical support for teachers are essential for effective ERT. Finally, Obiakor and Adeniran (2020) underscored collaboration and public-private partnerships to provide additional resources and expertise, a strategy recommended in various studies to enhance education delivery during crises.

The findings from the current study exploring the differential effects of ERT in Gombe State, Nigeria during the COVID-19 pandemic align with and expand upon existing empirical research. They emphasise the importance of addressing infrastructural, economic, and pedagogical challenges to ensure equitable and effective remote teaching and learning. The recommendations for future policies and strategies are well-aligned with empirical evidence and highlight the need for a multi-faceted approach to enhance educational resilience in the face of future disruptions.

## CONCLUSION

The study concluded that the most utilised ERT platforms were Radio, WhatsApp, Zoom, and YouTube. Also, significant differences exist in the types of ERT offered when considering various factors such as educational level (primary versus secondary), ownership status of the schools (public versus private), and geographical location (urban versus rural). These differences underscore the disparities in access to and implementation of

ERT across different educational contexts. However, the study found no evidence of gender-based differences in the forms of ERT provided, suggesting that male and female teachers provided similar types of remote instruction during the emergency period.

## RECOMMENDATION

Based on the findings of the study, the following policies and strategies are recommended to help education stakeholders in Gombe State and beyond prepare for future disruptions and minimize the negative impact of school closures on student learning:

1. Implement robust continuous learning strategies to ensure that learning is not disrupted during school closures.
2. Develop and enforce high-quality remote learning policies to maintain the standard of education delivery.
3. Establish quality assurance policies to monitor and evaluate the effectiveness of remote learning initiatives.
4. Implement equity policies to ensure that all students have equal access to remote learning opportunities and resources.

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