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DIGITAL SKILLS AND EDUCATOR INSTRUCTIONAL EFFECTIVENESS IN PRIMARY SCHOOLS IN IKOM EDUCATION ZONE, CROSS RIVER STATE, NIGERIA

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Abstract

Digital devices are increasingly being incorporated into teaching in other educational systems and that generates questions about the digital skills of educators and their instructional effectiveness in primary schools in the digital age of Nigeria. This Ex-Post Facto research, therefore, is being conducted to examine whether digital skills influence instructional effectiveness among teachers in primary schools in Ikom Education Zone of Cross River State, Nigeria, and it is underpinned by the human capital development theory. Two research questions and hypotheses were formulated for the study. 120 practitioners were drawn from six primary schools in the research area to participate. Data was generated using the Digital Skills and Primary Educator Instructional Effectiveness Questionnaire (DSPEIEQ). Data was analyzed via the simple linear regression analysis aided by SPSS. Findings revealed that access to, and competence in the use of digital devices have significant influence on instructional effectiveness among primary educators in the context. It is concluded that access and skillful use of digital infrastructure can increase teacher effectiveness in a digitized primary classroom. The recommendations, therefore, are that government should provide adequate ICT infrastructure in primary schools to facilitate teacher access to digital devices; and human development programmes designed for primary schools should emphasize the training of teachers on digital competence.

Keywords: digital skills, educator, instructional effectiveness, primary schools, Ikom education zone.

1.0 Introduction

The increasing value of digital tools for education in the world evokes concerns regarding the digital skills of educators as they affect their effectiveness to execute classroom programmes in Nigerian primary schools in the era of smart tech. Modern education has pivoted to a techno-centric world. Nigeria's education appears to be far behind in the digital race. Analogue practices

where a significant aspect of teacher services is rendered via manual operations tend now to be regarded as detrimental to modern education, job security and economic mobility. Routine educator activities which are non-digital are changing. Much of it is losing reliability and attraction. Digital abilities now constitute a crucial aspect of present-day innovations and school experience in which the work of the teacher becomes involvedly computer based, thus serving as the latest approach for driving developments in modern education into the future. The shift in favour of the digitization of the classroom has achieved serious attention in Nigeria eventually culminating in curriculum revision.

In September 3, 2025, the national government unveiled the new 'future ready' curricula for all levels of basic, senior secondary and technical education (Nigerian Educational Research and Development Council -NERDC, 2025) in the country. A major focus in the curriculum reforms is an emphasis on digital literacy (Muoeneke, 2024) in order to prepare the Nigerian pupil for a smarter future. This is marked by the introduction, for the first time, of technology-focused courses as core subjects in Nigeria's primary education. The action demonstrates the integration of primary education into the world of smart technologies right from the lower grades of the primary school. It also means making provisions for hiring and training teachers to be able to deliver services suitable for the times. It is a development which leads to teacher access to digital devices as well as competence in the usage within the sphere of digital divide (Afzal, Khan, Daud, Ahmad & Butt, 2023; van Dijk, 2017). Digital access by itself is an opportunity for the induction of illiterate practitioners into the digital world. Educators who have access to digital equipment are likely to close the gap in digital disparities (Eastin & LaRose, 2006).

A considerable number of teachers in Nigeria are familiar with tech tools because these pieces of equipment have been presented to them for use. Education programmes that involve digital access also focus on areas where there are deficits and challenges with a view to applying necessary interventions. The presence of digital inequalities, for example, is an apparent indication that access into the realm of Information and Communication Technology (ICT) is a privileged offer for some teachers within some educational systems. One evidence of this assertion can be seen in the recent curriculum revision in Nigeria's primary education (NERDC, 2025) as mentioned previously. Even at that, it is probable that the implementation could occur in theory. Except in addition with practical application, the mere mentioning of digital apparatuses, memorizing and/or picturing them do not have significant effects on educator digital skills in the classroom. Practice, on the other hand, is rather a very potent form of digital access that can lead to mastery in the usage of such tech implements, which World Bank (20016) refers to as digital dividends e.g. computers, online researches, emails, internet skills, videos calls and smart applications.

However, variations in access to digital technologies among elementary school teachers is sometimes determined by location. A majority of state schools in

Nigeria are established in rural sites (John & Aliyu, 2024). The provision of modern resources by government and stakeholders tend be concentrated in the urban schools. Although these efforts are geared towards improving education, it is also creating disparities in access to these resources between schools in the villages and cities. Islim, Ozudogru and Sevim-Cirak (2018) have also made reference to this issue, stating that rural community schools usually face inequalities in the distribution of educational opportunities. This is a common feature of a developing educational system. Keeping this in perspective, it suggests that location is a predictor of digital access. Teachers in rural schools may show an interest in, and perceive smart technologies as effective tools for the modern classroom, but the school may experience encumbrances in integration to the website, thus leading to poor bandwidth and infrequent usage. According to Kormos and Wisdom (2025), Redding and Walberg (2012), slow internet speed limit teacher ability from downloading instructional materials. Moreso, poor financial resources among rural teachers and schools can limit their abilities to purchase access rights compared to their city counterparts (Blau & Hameiri, 2017). Schools located in high socioeconomic communities tend to have a regular and better access to digital materials.

The age of the teacher is also featuring in the discourse regarding digital access. The emergence of the digital dispensation is relatively new in Nigeria. This explains why young teachers seem to be more abreast with digitization and have higher digital access than the previous generation of practitioners. In a survey involving Cueto, Felipe and León in (2018) on a very related topic, they found that young adult teachers, including new graduates, are more active users of electronic devices. This is not about intelligence. Rather, it has a connection with teacher interest, level of participation, number of digital-related tasks and readiness to adjust to modern teaching tools. It is, however, not clear whether there is a divide in digital access on the basis of gender among educators within the context. It is presumed that teachers from all genders who believe that technology has educational benefits are predisposed to incorporate digitization into their teaching. Nevertheless, on a male-to-female assessment, the score tends to favour the males. Effects of gender inequality in low socioeconomic communities can manifest in the form of disadvantages against female teachers in relation to digital access. Inadequacies in the provision of digital infrastructure in primary schools exacerbate the situation. Social barriers against women often culminate in reduced engagement of female teachers in technology-assisted teaching, especially in rural areas (GSMA, 2022). Rathore (2020) added that, cultural resistance does also occur in cases where digital technology is perceived as being foreign, and incompatible with local traditional values, practices and norms.

Apart from that, frequent use of electronic devices in the classroom can lead to excessive screen time which is inimical to learning; it compromises learner privacy and security, weakens critical thinking skills and promotes technology addiction. Correa (2015) noted that digital abilities have a strong positive correlation with social media usage e.g. Facebook, WhatsApp, TikTok,

Pheonix, YouTube, Max and WeChat or Weixin. Having unfettered access to these social media platforms also raises concerns about the possibility of human right abuses in school. Furthermore, the trends in the techno world give the indication that smart technologies in primary education in Nigeria do not compare with their counterparts in the developed societies. Elementary schools have continued to experience under-resourcing of modern facilities and equipment such as internet, hardware devices and electricity (Sammu & Johnson, 2024; Mukuni, 2019). It is a situation which makes access to digital technologies (very) difficult for the teacher, and technology-driven instruction even impracticable or non-existent. Blatant neglect by stakeholders to provide ICT infrastructure in Nigerian primary schools dismisses the very idea for the teachers to acquire digital skills and apply them in the classroom. This provides a more telling issue of why it is also necessary for the national education reform efforts to rethink a primary education curriculum that is fit for purpose in the digital dispensation.

By adopting digital approaches in teaching practices does not imply that other resources are unimportant. Material resources, for instance, are also useful manual complements and implements to the digital components. A primary education that thrives in the digital era is a reflection, not only of the kind of resources available and/or teacher capability, but more of teacher disposition to collaborate with computer related tools in performing classroom tasks. Proficiency in navigating digital tools and platforms is a sure way to teacher employment (Muoeneke, 2024); enhanced engagement (Parveen & Ramzan, 2024), exploration, enjoyable and impactful classroom lesson. A digital classroom revolves around the use of technology to execute instruction as well as the ability to use the technology ethically (Ewa, 2025; Dalimunthe, 2023). Tech-based teaching approaches such as gamification and blended learning rely on digital efficiency to make for a practical and interactive instruction.

It is to say that the teacher does not have to get stuck in the traditional teaching practices. Rather, it suggests the expedience for the practitioner to keep adjusting personal skills, as a self-preservation measure, so as to stay in the profession in an increasingly changing world. Digital competence, as regards the role of a teacher, focuses on new capabilities in a bid to shift to technology-based teaching. This is consistent with the human capital theory (Schumpeter, 2002) of which overall tenets emphasize the development of a man (the teacher), as the most important capital, to be able to provide optimal services to benefit society. Briggs (2023) pointed that it also shows the continuous pressure which a teacher has to endure in the effort to keep adapting to the changes in technology to be able to fulfill societal needs. Such technology-oriented practices in education are changing in-school cultures, prompting upskills among educators, making sure the innovation generates the expected impacts and/or outcomes. By design, some edu-technologies tend to have multitasking characteristics, and when properly applied, digital tools can address learner needs in a mix ability classroom. Positive achievements in teaching in the digital age is closely linked to digital competency (*cf*., Muoeneke, 2024).

Educators who actively employ technology produce learners with higher levels of critical thinking and communication skills (Schafft, 2016). The growing acknowledgement of digital skills is a remedy for bridging digital inequality between the developing and developed education systems (Misra, 2022), thus fostering digital inclusion in Nigeria's education. However, the didactic teacher may view the need for digital skills as a deskilling strategy, and a distraction rather than a smarter teaching assistant.

Computer-based subjects have been introduced into the curriculum of primary education. It suggests that the educator, as an implementer of the curriculum, is to adjust and adapt to digital media to be able to execute classroom instructions. Unfortunately, government does not seem to have in place measures for the educators to acquire digital skills for them to function effectively in a transformed school. In consequence, a considerable number of primary teachers seem to be lacking digital competence. This is impacting primary education negatively in the present digital dispensation. This study is therefore being conducted to inquire whether digital skills affect teaching effectiveness among practitioners in primary schools in Cross River State, Nigeria.

1.1 Purpose of the study

The research examined whether digital skills influence instructional effectiveness among teachers in primary schools in Ikom Education Zone of Cross River State, Nigeria. Specifically, it looked at the influence of:

1. Access to digital technologies on teacher instructional effectiveness; and
2. Digital competence on teacher instructional effectiveness.

1.2 Research questions

These questions were posed for the study:

1. How does access to digital technologies influence teacher instructional effectiveness?
2. What is the influence of digital competence on teacher instructional effectiveness?

1.3 Research hypotheses

The following null hypotheses were formulated to guide the study:

H_{O1}: Access to digital technologies does not significantly influence teacher instructional effectiveness.

H_{O2}: Digital competence has no significantly influence on teacher instructional effectiveness.

2.0 Research method

The quantitative strategy is being adopted, thus following the Ex-Post Facto (Asim, Idaka & Eni, 2017; Creswell, 2003) as the appropriate design to conduct the research in Ikom education zone. This is to facilitate hypotheses testing. Ikom education zone comprised six (6) local government areas: Abi, Boki, Etung, Ikom, Obubra and Yakurr. About 65 government approved primary schools were established across the education district (Cross River State Universal Basic Education Board (CR-SUBEB), 2021). Over 417 teachers, including 201 males and 216 females were working in these schools. 120

of these practitioners, comprising 60 males and 60 females, were recruited equally from six schools via the stratified sampling procedure (Asim et al., 2017) to take part. This represents 28.8 per cent of the population. This sample size is decided in this way so as to enhance the position for generalizability.

An instrument designed by the researcher named Digital Skills and Primary Educator Instructional Effectiveness Questionnaire (DSPEIEQ) was employed to generate numerical data. Teachers are familiar with questions and can provide data to support the research. It is a 20-item instrument, 10 for each hypothesis, and it consisted of the biodata and scaling item sections. The researcher is a specialist in primary education as well as research active, capable of designing questionnaires. DSPEIEQ was, nonetheless, forwarded to psychometricians for inspection and it passed. It was later subjected to a pilot study in a primary school located outside Ikom education zone in order to trial it in real research situation. The researcher had to step out of the original research area to prevent bias. Data emanating from the pilot study was subjected to analysis via Cronbach Alpha, and it gave a score of .76 per cent, indicating that DSPEIEQ is reliable for use in the primary study.

The participating schools were identified by officials of CR-SUBEB. Approval was thereafter obtained from CR-SUBEB and school heads, and informed consent received from the teachers for the study. Teachers are adults and can self-consent to participate in research. However, they had the opportunity to withdraw participation from the study at any time without giving a reason. A second was placed on standby in each local government area within the zone as contingency arrangement to prevent the occurrence of any unpleasant situations that could affect the progress of the research. The identity of every participant was covered in pseudonyms in compliance with the ethical protocols of research. DSPEIEQ was worded in ways that would prevent any emotive issues from developing in respondents. Provisions were, however, made for counseling services to address any emotive issues which may occur during the fieldwork. Participants' data were preserved securely by the researcher.

3.0 Results

Data from the personal information section of the DSPEIEQ was analyzed using simple percentage while those from the scaling item section of the questionnaire were analyzed via the simple linear regression hypothesis-by-hypothesis. Data analyses were performed via SPSS as shown in tables 1, 2 and 3:

Table 1: Participants' biodata

Category	Variable	Number	Percentage (%)
Name of school	A	20	16.7
	B	20	16.7
	C	20	16.7
	D	20	16.7
	E	20	16.7
	F	20	16.7
	Total	**120**	**100**
Gender	Males	60	50
	Females	60	50
	Total	**120**	**100**
Age	25-40	60	50
	41-50	42	35
	51+	18	15
	Total	**120**	**100**

Data on table 1 show that 20 teachers from each of the six schools, representing 16.7% per school participated. Amongst these practitioners, 60 males presenting 50% and 60 females representing 50% of the sample took part. It indicates an equal representation of the genders in the study. In terms of age, 600 practitioners aged between 25-40 years old, representing 50%, 42 of their colleagues aged between 41–50 years old, representing 35% and 18 of those aged above 51 years, representing 15% also participated. It illustrates that, across schools, a greater number of young teachers, followed by the middle-aged ones were involved in the study. Practitioners who were nearing retirement age had the lowest number of participants. It further implies that tutors who are very likely to engage with digital devices in teaching constituted a greater share of the sample size.

Table 2: Regression of access to digital technologies and teacher instructional effectiveness

R	R Square	Adjusted R Square	Std. Error of the Estimate
.075[a]	.006	.005	11.24652

Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value
Regression	562.146	1	581.240	3.246	.014*
Residual	64134.213	480	120.452		
Total	64696.359	481			

Variables	B	Std. Error	Beta	t-value	p-value
(Constant)	21.325	2.140		14.627	.000
Access to digital technologies	.216	.130	.072	.2.011	.024

*p<.05

Data on table 2 suggest that an R-value of .072 was obtained, producing an R-squared value of .006. This means that the variation in access to digital technologies accounts for about 6% of the total variation in teacher instructional effectiveness, thus the p-value (.014) associated with the computed F-value (3.246) is less than .05. Consequently, the null hypothesis is rejected. This indicates that access to digital technologies significantly influences the extent to which teachers are effective in delivering classroom instruction in the digital era. Thus, getting to access to digital tools and platforms foster job effectiveness among primary school teachers in the digital age. To test the significance of the combination of both the regression constant (21.325) and the regression coefficient (.216) making a significant contribution in the prediction model, that is, prediction of teacher instructional effectiveness (t = 14.627 & .2.011, p =.000 <.05), thus the presence of access to digital technologies. The mathematical relationship is depicted by the following equation y = 21.325+.216x where y is access to digital technologies and x is teacher instructional effectiveness.

Table 3: Regression of digital competence and teacher instructional effectiveness

R	R Square	Adjusted R Square	Std. Error of the Estimate
.075[a]	.008	.005	11.24652

Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value
Regression	562.146	1	581.240	3.681	.016*
Residual	64134.213	480	120.452		
Total	64696.359	481			

Variables	B	Std. Error	Beta	t-value	p-value
(Constant)	21.325	2.140		18.447	.000
Digital competence	.216	.130	.081	.3.086	.024

*p<.05

Data on table 3 illustrate that an R-value of .081 was obtained, resulting in an R-squared value of .008. This means that the variation in digital competence accounts for about 8% of the total variation in teacher instructional effectiveness, thus the p-value (.016) associated with the computed F-value (3.681) is less than .05. As such, the null hypothesis is jettisoned. This indicates that digital competence has significant influence on the extent to which teachers can effectively deliver classroom instruction. Thus, the ability to use digital tools promotes job effectiveness among primary school teachers in the digital dispensation. To test the significance of the combination of both the regression constant (21.325) and the regression coefficient (.216) making a significant contribution in the prediction model, that is, prediction of teacher instructional effectiveness (t = 18.447 & .3.086, p =.000 <.05), thus the presence of digital competence. The mathematical relationship is depicted by the following equation y = 21.325+.216x where y is digital competence and x is teacher instructional effectiveness.

4.0 Discussion

The finding for hypothesis one suggests that access to digital technologies significantly influences teacher effectiveness in delivering instruction primary classroom in Ikom education zone in the digital era. It is so because access serves as a precondition for illiterate teachers to be introduced to digital devices as the latest equipment for facilitating teaching in an education system which futuristically is likely to be driven by smart technologies. Drawing from the views of Afzal et al. (2023) and van Dijk (2017), it presents early possibilities and opportunities for teachers to bridge the digital divide in modern education thereby addressing the issue of digital exclusion in the zone. According to Eastin and LaRose (2006), it helps educators to narrow the gap in digital inequalities which is often brought about by level of resourcing of schools; gender, age and location of the teacher and/or school. In

addition, access initiates the process for a tutor to master the usage of such tech implements e.g. computer operation, online researches, emails, internet skills, videos calls and smart applications, tools which World Bank (20016) refers to as digital dividends. You can imagine the feelings which teachers in low socioeconomic communities would experience when given the chance to see, touch and to know that computer-based resources would form an integral aspect of their daily teaching practices. Such moments can spark positive affective properties, prompting the desire for the educator to upgrade capabilities and upscale capacity for s/he to be effective in the classroom and in the profession.

Additionally, the result for hypothesis two surmises that digital competence has significant influence on teacher effectiveness in classroom instruction. This is because effective teaching in the digital age is measured by teacher abilities to operate digital devices in the classroom. Consistent with this finding, Parveen and Ramzan, (2024) stated that proficiency in navigating digital tools and platforms is a sure way to enhanced engagement. Educators who are skillful in applying digital tools during teaching provide pupils with opportunities for exploration, exciting and impactful classroom lessons. Muoeneke (2024) views it as a means and a requirement for teacher employment in the era of (super) computers. Although teachers may experience additional pressures on the job due to the necessity to collaborate with digital tools in the classroom, digital competency, nevertheless, generates positive outcomes from that kind of teaching. For instance, Schafft (2016) noted that educators who actively employ technology produce learners with higher levels of critical thinking and communication skills. The easiness characteristic in the functioning of the tools enables deeper level of thinking in children and enhances the means for them to develop language. Frequent use of the tech resources in the classroom can lead to expertise and confidence in the use of the equipment. There is also the tendency for a teacher to become attached to the tools in his or her daily engagements in the classroom, and to be abreast with the ethical principles governing their application to perform classroom tasks well.

5.0 Conclusion

The expansion in the educational benefits of digital tools around the world is encouraging the digitization of teaching in the Nigerian primary school system. It has necessitated changes in the role of the primary school educator so as to be useful and effective in implementing classroom programmes. This is because the teacher is crucial in the implementation of the curriculum. By implication, a practitioner who is digitally inept falls short of the personnel requirements in a technology-driven educational circle. Acquisition of digital skills, therefore, serves as a sustainable strategy for teachers to provide effective services so as to achieve job security, promote practical and innovative learning as well as to drive other school improvement programmes in ways that adapt to the rapid changes in the techno-centric world.

Recommendations

Based on the findings, the following recommendations were made:

1. The introduction of computer-based subjects in primary schools by government should serve as an opportunity for it to provide adequate ICT infrastructure in the schools to facilitate teacher access to digital tools; and
2. Human development programmes for primary schools has to highlight training of teachers on digital competence.

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