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Promoting Sustainable Development through Digital Literacy: The Transformative Role of Youth Mentorship in Igbaja, Nigeria

Musa Ilias Biala; Taofeekat Temitope Nofiu; Ololade Mistura Aromasodun; Yusuf Toyin Yusuf; Abdul Muftah Shitu; Kingsanjo Kolawole Peter; and Fatai Akosile

Department of Economics and Development Studies, Kwara State University, Kwara State, Nigeria.

Corresponding author: musa.biala@kwasu.edu.ng

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Abstract

Despite the critical role of digital literacy in education, employment, and socio-economic development, rural areas like Igbaja face significant barriers, including limited access to technology, poor internet connectivity, and a lack of trained mentors. Therefore, through a structured mentorship programme, this action research evaluated and enhanced digital literacy among youth in Igbaja, a rural community in Kwara State, Nigeria. The study employed a mixed-methods approach, combining survey and a quasi-experimental mentorship intervention to assess digital literacy levels, identify challenges, and measure the impact of mentorship. Findings reveal that while the participants exhibited proficiency in using smartphones and social media, they lacked foundational digital skills such as Microsoft Office applications, email management, and online safety. The mentorship programme significantly improved the participants' digital literacy, with 97.1% reporting enhanced knowledge and 92.6% acquiring new skills. Key barriers identified include limited device access (60.3%), insufficient skills (14.7%), and poor internet connectivity (13.2%). The study concludes that mentorship is an effective strategy for bridging the digital divide in rural communities, and thus enhancing inclusive and sustainable development. Recommendations include integrating practical digital skills into school curricula, and establishing community digital hubs to sustain literacy gains. This research contributes to policy and practice by offering a scalable model for digital empowerment aligned with Sustainable Development Goals (SDGs) 4, 8, 9, 10, and 11.

Keywords: Digital Literacy, Quasi-Experiment, Rural Communities, Sustainable Development, Youth Mentorship.

Introduction

The rapid advancement of digital technologies has fundamentally transformed global communication, education, and economic opportunities, making digital literacy a critical skill for youth empowerment and socio-economic development (Livingstone & Third, 2022). In developing countries like Nigeria, digital literacy has emerged as a crucial pathway for bridging socio-economic disparities and enabling youth to participate effectively in the digital economy (Sutirman, 2022).

In an increasingly digital world, the ability to access, understand, and effectively use digital technologies is essential for personal growth, education, employment, and active citizenship. This ability, known as *digital literacy*, encompasses skills related to the use of digital devices, online platforms, and information and communication technologies (ICT). Digital literacy is crucial for youth, who are expected to navigate a rapidly evolving digital landscape, contributing meaningfully to society and the economy. The youths are able to engage effectively in society because of these abilities and attitudes (Hague & Payton, 2011). Digital literacy is pivotal in enabling individuals to participate effectively in the modern digital economy. However, digital literacy levels vary widely, particularly in developing regions where access to technology and educational resources is often limited.

Against the above backdrop, Nigeria government has initiated several national programmes to enhance digital skills among youth, such as the National Digital Economy Policy and Strategy (NDEPS), which aims to achieve 95% digital literacy by 2030. The collaboration between the National Information Technology Development Agency (NITDA) and the National Youth Service Corps (NYSC) is an example of initiatives designed to empower Nigerian youth with digital competencies. This collaboration trains participants in software development, data analysis, and cyber security, which are vital for economic participation and innovation (Vanguard, 2024).

Yet, a significant digital divide still persists in rural areas. While urban centers in Nigeria are advancing in digital technology adoption, rural communities still continue to face barriers such as inadequate infrastructure, socio-economic challenges, and a lack of awareness regarding the importance of digital literacy (National Wire, 2024; Vanguard, 2024). According to the Nigerian Communications Commission (2023), while internet penetration has increased to approximately 46.5% nationwide, rural areas continue to experience significantly lower digital connectivity rates. A recent study indicates that only 38% of Nigerian youth possess basic digital skills, with rural youth being disproportionately underrepresented in this category (Ask Nigeria, 2023). This deficiency in digital skills restricts their access to educational resources, job opportunities, and entrepreneurial ventures. It impedes their ability to leverage digital technologies for personal and professional growth, creating a cyclical pattern of technological marginalization.

The digital landscape in Nigeria presents both challenges and opportunities for youth development. Kwara State, particularly Igbaja, Ifelodun local government area, represents a microcosm of the digital divide challenges prevalent in rural Nigerian communities. This digital divide not only limits educational and economic opportunities but also perpetuates existing social inequalities (Okocha & Edafewotu., 2022). Research indicates that rural youth often face significant challenges or barriers to digital access and skills. Such barriers include limited infrastructure, limited access to digital tools, economic constraints, insufficient training opportunities, inadequate educational resources, and a lack of supportive structures like mentorship to facilitate digital inclusion. (Okocha & Dogo, 2023). These challenges exacerbate the digital divide and hinder the potential for rural youth to participate fully in modern economic and social activities.

The lack of mentorship worsens these issues, as many young individuals lack the guidance necessary to navigate and leverage digital technologies effectively (NITDA, 2023). Mentorship has, therefore, emerged as a promising strategy for addressing the digital literacy gap, particularly in underserved communities (Soltovets et al., 2020). Mentorship programmes, where more experienced individuals guide and support youth, can provide personalized learning, skill development, and encouragement. Structured mentorship programmes tailored to rural youth can not only enhance their technical competencies but also build their confidence and motivation to explore the digital landscape. Studies have demonstrated that structured mentorship interventions can significantly enhance digital competencies, self-efficacy, and technological confidence among young people (Lee & Yaprak, 2022). Through mentorship, young people can receive personalized guidance, exposure to digital tools, and access to resources that would otherwise be inaccessible. By offering mentorship in digital literacy, youth can gain not only technical skills but also the confidence to use digital tools effectively in their daily lives. By providing targeted guidance, skill transfer and motivational support, mentorship programmes can effectively bridge digital literacy gaps and create pathways for digital inclusion.

Meanwhile, a plethora of research has been conducted on digital literacy development. Such studies include Peijian and Zhang (2020), Wang (2021), Modan (2021), Thomas et al. (2021), Yuxiang and Jian (2022), and Wei (2022). However, only limited research (e.g., Hatlevik & Christophersen, 2013; Soltovets et al., 2020) has been conducted on the role of mentorship in digital literacy development. Hatlevik and Christophersen (2013) investigated digital competence in upper secondary schools and discovered that education is a key aspect of digital inclusion and technologies and it has become a key means of engaging all levels of educational system and their curriculum to achieve digital competence. Soltovets et al.'s (2020) study was conducted on the role of mentorship in digital literacy development. The study was conducted among doctoral students at British universities. This justifies the need to fully understand and systematically address digital literacy challenges in the rural areas in order to foster inclusive sustainable development.

It is against this background that this study sought to examine digital literacy among youths in Igbaja in Ifelodun local government area of Kwara state. Specifically, the study set out to;

i. measure and evaluate the current level of digital literacy among Igbaja youth;
ii. identify and evaluate the challenges and barriers affecting digital literacy among Igbaja youth;
iii. enhance digital literacy development of Igbaja through a mentorship programme; and
iv. estimate the impact of the youth mentorship programme on digital literacy.

By focusing on Igbaja, the study aimed to develop a broad understanding of digital literacy challenges and potential intervention strategies. This approach corresponds with global sustainable development goals, particularly those emphasizing quality education, reduced inequalities, and technological empowerment (United Nations, 2022). The choice of Igbaja as the location for this study was informed by the low level of digital literacy owing to the

lack of the ICT infrastructure needed to promote digital literacy. Hence, the mentorship programme could act as a catalyst for reducing digital exclusion and fostering socio-economic development in Igbaja community.

The rest of this paper is divided into 4 sections. Section 2 presents the theoretical analysis of the study. Section 3 contains the methodology adopted for the study, followed by Section 4 which presents and analyses the results, while Section 5 presents the conclusion and recommendations stemming from the study.

Review of Literature

Digital literacy refers to a set of knowledge, skills and tasks related to the use of digital devices, online platforms, and information and communication technologies (ICT). It encompasses the ability to effectively and critically navigate, evaluate, and create information using a range of digital technologies. It also involves understanding and managing the social, ethical, and security dimensions of technology use (National Wire, 2024). Digital literacy leads to digital transformation which serves as a driving force towards industrialization and development (Soltovets et al., 2020). Digital transformation aims to achieve changes in the economy in the areas of businesses, enterprise models, core processes/structures and strategies under the influence of digital and internet technology to enhance operational efficiency of the economy (Liu and Zhao, 2023).

There are several ways of achieving digital literacy, among which is mentorship. Mentorship is referred to as a developmental relationship in which a more experienced or knowledgeable individual (the mentor) guides, supports and advises a less experienced person (the mentee) (Allen, et al., 2006). Similarly, Oshinkale (2019) see mentorship as a relationship between two people where the individual with more experience, knowledge and connections is able to pass along what he or she has learned to a more junior individual within a certain field.

Mentorship theory provides a conceptual and empirical framework for understanding how mentoring relationships function, what they involve, and what outcomes they produce. Kram's Mentor Role Theory (1985) identifies two primary functions of mentoring—*career functions* and *psychosocial functions.* Career functions include sponsorship, coaching, protection, exposure and visibility, and challenging assignments while psychosocial functions entail role modeling, acceptance and confirmation, counseling, and friendship (Kram, 1985). The theory also outlines four phases of the mentoring relationship—initiation, cultivation, separation, and redefinition. By *initiation*, relationship begins with mutual expectations. *Cultivation* involves active guidance, skill development, and support. By *separation*, mentee gains independence; mentor steps back. By *redefinition*, relationship evolves into collegiality or friendship.

Another relevant theoretical framework is *Technology Acceptance Model (TAM)*, developed by Davis (1989). TAM is a psychological theory widely used to study user acceptance of any technology (Venkatesh & Bala, 2008). It is a theoretical framework that explains how individuals come to accept and use new technologies. It explains how technological

advancements influence behaviour. Thus, TAM is applicable to adoption of digital technologies (e.g., smart phones, computers, browsing/websites or ICT in general), the subject matter of this study.

TAM suggests that two main factors influence a person's decision about adopting a digital technology: perceived usefulness and perceived ease of use. *Perceived usefulness (PU)* is concerned with the extent to which a person believes that using a particular technology will improve their performance or provide benefits (Davis, 1989). For example, "I believe using a digital platform will increase my profit or better my life". *Perceived ease of use* (PEOU) has to do with the degree to which a person believes that using a digital technology is effortless (Venkatesh & Davis, 2000). For example, "Digital technologies are simple and easy to use". TAM has been expanded to include social and facilitating conditions or variables such as social influence, experience, and system quality (Venkatesh & Davis, 2000; Venkatesh et al., 2003; Venkatesh & Bala, 2008) to have Unified Theory of Acceptance and Use of Technology (UTAUT). These factors influence users' adoption of a new digital technology or any other technology.

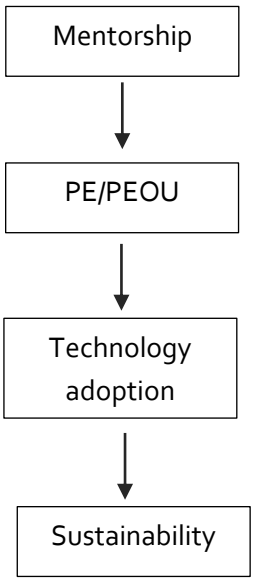
However, when applied in rural or developing contexts, TAM faces some limitations and critiques due to its foundational assumptions and the specific socio-economic, cultural, and infrastructural realities of rural communities like Igbaja. One, TAM emphasizes individual perceptions, neglecting structural barriers. It assumes that technology adoption hinges on user attitudes, but in rural areas, infrastructural and economic constraints often dominate (Venkatesh et al., 2016). For example, electricity and internet access are critical yet unreliable in many Nigerian rural communities (Aker & Mbiti, 2010). Device affordability limits adoption regardless of perceived usefulness. The implication of this is that even if youth in Igbaja find digital tools useful, adoption may fail due to external barriers not accounted for in TAM.

Two, TAM gives insufficient attention to cultural and social influences. It overlooks social norms and community dynamics, which are pivotal in collectivist societies (Straub, 2009). In Nigeria, Peer and mentor influence may outweigh individual perceptions (Olatunji, 2021). Gender and age hierarchies can restrict access. Hence, social capital may drive digital literacy more than TAM's cognitive factors. Three, TAM assumes pre-existing digital literacy. It presupposes users can navigate technology, but rural populations often lack basic digital skills (Warschauer, 2003). In Nigeria, many youths first encounter tech through informal mentorship rather than formal education (Adegbola, 2019). Low literacy rates may render PEOU irrelevant. The implication is that mentorship programmes must first build foundational skills before TAM's constructs apply.

While the Technology Acceptance Model offers useful insights into individual technology adoption, it is insufficient as a standalone framework to explain digital literacy adoption in Igbaja. Therefore, to better understand how digital literacy and youth mentorship promote sustainable development, mentorship theory is integrated with TAM to form the theoretical framework for this study. By critically engaging with these limitations—and incorporating mentorship dynamics, infrastructural barriers, and cultural factors—this

study can provide a more nuanced understanding of sustainable digital development in rural Nigeria.

This integrated theoretical framework connects digital literacy (technology adoption) with mentorship to explain how and why young people adopt digital literacy skills. Mentorship can enhance digital literacy and hence PU and PEOU of a new digital technology. It can increase PU by demonstrating real-world applications (e.g., using digital tools for farming, business, or education) or how digital skills will improve livelihoods. Mentorship can improve PEOU by providing hands-on training, simplifying complex concepts, and demonstrating that digital technologies (e.g., smartphones, computers, and the Internet) are accessible and easy to learn. It can reduce barriers (e.g., fear, lack of skills) to adopting digital tools. Hence, mentorship acts as a causal factor in the technology adoption process. It influences technology adoption by enhancing both PU and PEOU as follows:



By strengthening digital competence and reinforcing positive attitudes towards digital technology, mentorship accelerates the adoption of digital literacy and amplifies its impact on youth-driven sustainable development efforts. Thus, TAM offers a robust lens for examining how digital literacy—supported through mentorship—can empower youth to become active agents of sustainable change.

Methodology

This section contains the methodology adopted for this study, which includes the research design, description of the study location, population and sample for the study, sampling techniques and procedure, research instrument, and data analysis.

Research Design

Given the objectives of this study, survey and experimental designs were employed. To measure the success and impact of our mentorship programme, both a baseline and an endline survey were conducted to help provide a snapshot of the current state of the digital knowledge of Igbaja youth, track progress and success, tailor our intervention (mentorship) effectively, and evaluate the impact of the mentorship programme on digital literacy level. To achieve these, both a self-assessment questionnaire and a hetero-assessment questionnaire were administered to participants to evaluate their digital skills and knowledge. This approach provides a balanced evaluation, combining personal reflection with external feedback. A practical skill test was also administered to evaluate the participant's ability to perform a specific digital task or skill in a real-world environment.

In order to observe the effect of the mentorship programme on the participants, an experiment in which a group of secondary students were exposed a mentorship programme was conducted. Specifically, a quasi-experiment, using the pretest-posttest design with mentorship intervention, was carried out because a random assignment of participants would be unethical. This approach allowed for measuring baseline digital literacy, evaluating skills, and assessing the impact of the mentorship programme.

Study Location

The study was conducted in Igbaja, a historic town located in the Ifelodun Local Government Area of Kwara State, Nigeria. It is situated in the southwestern region of Kwara State. It is situated approximately 56 kilometers northeast of Ilorin, the state capital (Igbaja, 2024). The town is part of the Igbomina region and is known for its rich cultural heritage and historical significance. It lies within the Yoruba-speaking region, and its residents are predominantly Yoruba people. The town is surrounded by neighboring communities like Share, Omupo, and Oro. It is known for its rich cultural heritage, religious significance, educational institutions, and agricultural activities.

Igbaja's economy is primarily agrarian, with residents engaged in farming activities. Major crops grown include yam, cassava, maize, and guinea corn. Trading and small-scale businesses also contribute to the local economy. The town hosts several primary, secondary, and tertiary institutions, and its emphasis on education has contributed to the town's development and the production of educated elites.

However, the level of digital literacy in the town is purportedly low (Kwara State Government [KWSG], 2024). Therefore, among the towns in Ifelodun, Igbaja community is selected as the location for this study. The choice of this community is informed by the low level of digital literacy owing to the lack of the ICT infrastructure needed to promote digital literacy. To buttress this point, in august 2024, the Executive Governor of Kwara State, AbdulRahman AbdulRazaq, in his bid to enhance the digital literacy of the community, provided the community with 250 sets of desktop computers in order to ease the sitting of JAMB and other CBT exams in the community (KWSG, 2024).

Study Population, Sample and Sampling Technique

The target population for this study comprises all the youth aged 15–25 years in Igbaja. The study utilized two-stage cluster sampling technique to select a representative sample of 68 participants from three public secondary schools in the community. In the first stage of sampling, the Igbaja community was divided into three geographical clusters from which three secondary schools (one from each cluster) were selected. Thereafter, the whole Senior Secondary School 3 (final-year) students of these selected schools were invited for mentorship on digital literacy, and the 68 students who honoured the invitation constituted the sample for the students. The choice of final-year students was influenced by the fact that they had been enrolled to write the Unified Tertiary Matriculation Examination (UTME) in which digital skills are required to pass the examination.

Research Instruments

The data required for this study was elicited through a **s**tructured questionnaire and a digital skills test. The questionnaire was administered to participants to collect self-reported information on digital literacy levels. The questionnaire contained information on digital literacy level, socioeconomic status and factors hypothesized to contribute to digital literacy. The digital skills test was used as a practical assessment to gauge hands-on digital skills (e.g., using Microsoft Office, internet navigation, email management). It was conducted for the participants to evaluate their understanding of the trainings on the usage of digital technology.

Data Analysis

Both descriptive and inferential statistics were used to analyse the data elicited for this study. Descriptive statistics were used to summarize the data collected from surveys, providing an overview of the key variables related to socioeconomic status, the level of digital literacy, and factors that contributed to the poor level of digital literacy. Afterwards, comparative analysis was performed to identify and evaluate the variations in the digital literacy performance of the participants before and after the mentorship. While such statistics as means, percentages, and frequency distributions were used for descriptive analysis, an OLS regression model was employed for comparative inferential analysis to compare pre- and post-intervention scores.

Considering the objectives of this study, the data analysis was divided into two phases:

Phase 1: Digital Literacy Measurement and Evaluation (Baseline Assessment)

The objective of this study was to measure the current level of digital literacy among the participants. While survey and questionnaire was used to collect self-reported information on digital literacy levels, a digital skills test was administered to gauge the hands-on digital skills of the participants, such as using Microsoft Office, internet navigation, e-mail management. The key metrics included the following:

a) Ability to use digital tools (computers, smartphones).

b) Knowledge of basic software applications.
c) Online communication skills.
d) Understanding of online safety and security.

Phase 2: Digital Literacy Enhancement (Mentorship Intervention)

The objective here was to enhance digital literacy through the structured mentorship programme, which lasted for eight hours. This phase involved a training session (covering core areas such as basic computer use, internet skills, digital communication, and online safety) and hands-on project (practical tasks to reinforce learning, including creating documents, sending emails, using social media responsibly). The expected outcomes of this phase included improved digital literacy skills, enhanced confidence in using digital tools, and increased awareness of digital safety practices.

Model Specification

To estimate the impact of the youth mentorship program on digital literacy, we specified the following difference-in-differences (DiD) regression model to compare pre- and post-intervention scores of the participants:

$$DLS_i = \beta_0 + \beta_1 Post_t + \beta_2 Ment_i + \beta_3 (Post_t \times Ment_i) + \varepsilon_i \quad (1)$$

where DLS_{it} = Digital literacy score of individual *i* at time *t* (pre or post), $Post_t$ = 1 if post-intervention, 0 if pre-intervention, $Ment_i$ = Mentorship participation (a binary variable: 1 = participated, 0 = did not participate), $(Post_t \times Ment_i)$ = Interaction term to measure the effect of mentorship, β_3 = Coefficient representing the impact of mentorship on digital literacy, and ε = Error term.

It was expected that $\beta_3 > 0$ and significant to indicate that the mentorship programme significantly improves the digital literacy level after intervention.

Ethical Consideration

This study adhered to strict ethical guidelines to ensure the voluntary participation, informed consent, and confidentiality of all participants. Informed consent was obtained from all participants prior to their involvement in the research. The objectives, procedures, potential risks, and benefits of the study were clearly explained in both written and verbal formats, using language appropriate to the participants' comprehension levels. Participants were informed that their participation was voluntary and that they could withdraw from the study at any time without any negative consequences. To ensure participant privacy and confidentiality, all data collected were anonymized. Personal identifiers were removed or coded, and data were stored securely with access limited to the research team. For all participants, consent was obtained from their respective schools in accordance with ethical guidelines for research involving minors.

Results and Discussion

Descriptive Analysis

Table 1 shows that most of the participants (77.9%) aged 15–18 while only 22.1% aged 19–23. The mean age of the participants was 17 years with a minimum of 15 years and a maximum of 23 years. This age distribution indicates that the study was predominantly focused on adolescents who are at a critical developmental stage for digital literacy acquisition. Meanwhile, gender was almost equally represented in the sample. The number of male students was 31 (about 46%) while females were 37 (about 54%).

Regarding digital access, about 72% of the participants affirmed having access to digital devices, while about 28% reported no access. Among those who had access, the majority used smartphones (84%) compared to 16% who had access to computers or laptops. This highlights the dominance of mobile technology in the community and suggests that any digital literacy initiatives should be optimized for smartphones.

Table 1 Demographic Results

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Age				
15-18	53	77.9	77.9	77.9
19-23	15	22.1	22.1	100.0
Gender				
Female	37	54.4	54.4	54.4
Male	31	45.6	45.6	100.0
Access to Digital Devices				
Yes	48	70.6	71.6	100.0
No	19	27.9	28.4	28.4
Types of Devices Accessed				
Smartphone	42	61.8	84.0	84.0
Computer/Laptop	8	11.8	16.0	100.0
Frequency of Internet Use				
Never	16	23.5	23.9	23.9
Rarely	9	13.2	13.4	37.3
Weekly	15	22.1	22.4	59.7
Daily	27	39.7	40.3	100.0
Location of Internet Access				
Home	41	60.3	61.2	61.2
School	7	10.3	10.4	71.6
Cybercafé	10	14.7	14.9	86.6
None	9	13.2	13.4	100.0

Source: Authors' computation

In terms of internet usage, 40.3% reported daily use, 22.4% used it weekly, 13.4% used it rarely, and about 24% never used it. This indicates a significant portion of the participants

were not connected with the Internet, pointing to the need for mentorship programmes that not only teach skills but also promote consistent and meaningful digital engagement. With respect to internet access points, 61.2% accessed the internet at home, 10.4% at school, and 14.9% via cybercafés, while 13.4% had no regular access point. This result suggests a strong reliance on home-based internet, with relatively little institutional support through schools.

Measuring and Evaluating of Current Level of Digital Literacy

In line with Objective 1, the results in Table 2 indicate a mixed proficiency in various aspects of digital literacy. While many participants demonstrated fluency with social and communication tools such as smartphones and social media (where 48.5% and 41.2% respectively strongly agreed to their proficiency), the results revealed their significant weaknesses in foundational and productivity-oriented digital skills. For example, only 5.9% strongly agreed to know how to use a computer or laptop, and 7.4% claimed high proficiency in Microsoft Office applications. Competencies such as organizing folders, managing digital documents, and identifying phishing scams were areas where the majority reported low or no proficiency pointing to a digital divide within task-oriented digital literacy.

Table 2 Level of Digital Literacy among Igbaja Youth before Mentorship

Statement	SD (%)	D (%)	A (%)	SA (%)	Valid N	Missing
I know how to use a computer or laptop	41.2	35.3	17.6	5.9	51	17
I know how to use a Smartphone for communication and information search	5.9	13.2	32.4	48.5	68	0
I can use Microsoft Office applications (Excel, Word, PowerPoint)	46.3	33.3	13.0	7.4	54	14
I can browse the internet to find information	4.8	11.3	46.8	37.1	62	6
I know how to send and receive emails	12.5	21.9	25.0	40.6	64	4
I can use social media platforms for communication	2.9	7.4	48.5	41.2	68	0
I understand how to use video conferencing tools	22.2	31.5	25.9	20.4	54	14
I know how to download and store files on my device	19.4	8.1	40.3	32.3	62	6
I can create and organize folders on a computer	35.0	41.7	10.0	13.3	60	8

Table 1: Contd.

Statement	SD (%)	D (%)	A (%)	SA (%)	Valid N	Missing
I understand how to manage digital documents	35.7	44.6	5.4	14.3	56	12
I know how to set secure passwords	23.0	19.7	29.5	27.9	61	7
I can identify potential online scams or phishing attempts	31.4	35.3	25.5	7.8	51	17
I know how to protect my personal information online	11.9	35.6	25.4	27.1	59	9
I can determine the credibility of information found online	32.7	22.4	26.5	18.4	49	19
I can troubleshoot basic computer or device issues	38.2	27.3	20.0	14.5	55	13
How often do you use digital tools for learning or work purposes	19.7 (Never)	18.0 (Rarely)	24.6 (Daily)	37.7 (Weekly)	61	7
Have you received formal training in digital skills before?	39.7(No) 60.3 (Yes)				68	0
How do you rate your overall digital literacy level?	Rated Beginner = 61.8% Rated Intermediate =36.8% Rated Advanced = 1.5%				68	0
DLS[b] Index	Mean = 2.63; SD = 0.69					

Note: SD = Strongly Disagree, D = Disagree, A =Agree, SA = Strongly Agree, DLS = Digital Literacy Score, SD = Standard Deviation.

Source: Authors' computation

Interestingly, when asked about how often they use digital tools for learning or work purposes, only 24.6% reported daily use, while 19.7% claimed they never use such tools. A more encouraging sign is that 60.3% of the respondents reported having received some form of formal training in digital skills, indicating an opportunity to build on existing exposure. However, when asked to rate their overall digital literacy, a dominant 61.8% still considered themselves beginners, with only 1.5% identifying as advanced users. These results confirm that despite training efforts, many youths remain on the lower rungs of the digital literacy ladder. This finding is in line with previous studies such as Dosumu (2024), who observed that Nigerian youths often receive fragmented or informal training, lacking the depth and consistency needed for sustained digital empowerment. Ekoko (2023) similarly argued that rural youth tend to rely on mobile phones and social platforms for learning, but these do not substitute for structured digital education. In the same vein, Thomas et al. (2019) contended that digital literacy development in rural areas is often hindered by infrastructural limitations and inconsistent mentorship, which can lead to a gap between theoretical exposure and practical application.

Igbaja youth's pre-mentorship digital literacy assessment showed the mean digital literacy (DLS) index of 2.63 (on a 1–5 scale), indicating low level of digital literacy of the participants. This suggests that most of the participants had trouble with basic digital abilities and were only able to perform very basic tasks with considerable limits. Some of the participants scored close to moderately competent, while others scored far lower, according to the standard deviation of 0.69, which indicates moderate heterogeneity within the group. With most of the participants lacking the skills necessary for meaningful engagement in the digital economy, these findings revealed that digital exclusion is still pervasive in Igbaja. The findings highlight the pressing need for focused mentorship intervention programmes to improve foundational skills of the youth in the community.

Table 3 presents a nuanced picture of digital literacy among Igbaja youth following mentorship interventions. While participants showed higher competence with social and mobile technologies as evidenced by 51.6% who strongly agreed with smartphone proficiency and 45.0% with social media skills, the results revealed uneven improvement across all measures or items of digital competencies. The post-mentorship Digital Literacy (DLS[a]) index of 2.88 represents a modest but meaningful improvement from the pre-intervention baseline of 2.63, suggesting the programme moderately enhanced the participants' digital skills.

Table 3 Level of Digital Literacy among Igbaja Youth after Mentorship

Statement	SD (%)	D (%)	A (%)	SA (%)	Valid N	Missing
I know how to use a computer or laptop	8.6	8.6	50	32.8	58	10
I know how to use a smartphone for communication and information search	3.2	1.6	43.5	51.6	62	6
I can use Microsoft Office applications (Word, Excel, PowerPoint)	8.9	21.4	46.4	23.2	56	12
I can browse the internet to find information	6.6	3.3	47.5	42.6	61	7
I know how to send and receive emails	9.8	8.2	55.7	26.2	61	7
I can use social media platforms (WhatsApp, Facebook, etc.)	3.3	3.3	48.3	45	60	8
I understand how to use video conferencing tools (Zoom, Skype)	7.5	20.8	41.5	30.2	53	15
I know how to download and store files on my device	3.2	9.5	50.8	34.9	63	5
I can create and organize folders on a computer	8.6	22.4	43.1	25.9	58	10
I understand how to manage digital documents	12	24	48	16	50	18
I know how to set secure passwords	9.1	10.9	47.3	32.7	55	13
I can identify potential online scams or phishing attempts	14	24	38	24	50	18
I know how to protect my personal information online	5.7	18.9	41.5	34	53	15
I can determine the credibility of information found online	7.1	12.5	50	30.4	56	12
I can troubleshoot basic computer or device issues	15.1	34	28.3	22.6	53	15
DLS Index	Mean 2.88			SD = 0.73		

Source: Authors' computation

Notable skill disparities persist despite these gains. Foundational computing abilities remained underdeveloped, with only 32.8% strongly confident in computer/laptop use and just 23.2% expressing strong Microsoft Office proficiency. Particularly concerning are the enduring gaps in cybersecurity awareness (24.0% strongly agreed they could identify scams) and digital organization skills (25.9% strongly agreed on folder management). These patterns align with Livingstone et al.'s (2021) identification of "platform-specific proficiency gaps" in similar interventions, where mobile skills consistently outpace productivity tool mastery.

The mentorship programme appeared most effective in building basic operational competencies, as seen in the 34.9% who strongly agreed about file management skills—a crucial improvement from pre-training levels. However, the moderate standard deviation (0.73) suggests significant variation in learning outcomes, potentially reflecting what Abubakre et al. (2023) describe as the "participation-application gap" in digital skills training, where learners engage differently with various programme components.

Identifying and Evaluating of Digital Challenges Faced by Youth in Igbaja

As shown in Table 4, the result for Objective 2 revealed several critical impediments to digital literacy in Igbaja. A significant proportion of respondents (60.3%) identified lack of access to digital devices as the primary challenge. This result underscores the technological divide that continues to persist in rural areas, where economic limitations may restrict the ability of youth to acquire smartphones, laptops, or tablets necessary for digital engagement.

Table 4 Challenges and Barriers Affecting Digital Literacy among Igbaja Youth

Challenges Faced When Using Digital Tools	Frequency	Percent	Valid Percent	Cumulative Percent
Lack of access to devices	41	60.3%	60.3%	60.3%
Lack of internet connectivity	9	13.2%	13.2%	73.5%
Lack of knowledge or skills	10	14.7%	14.7%	88.2%
Fear of making mistakes	7	10.3%	10.3%	98.5%
Others	1	1.5%	1.5%	100.0%
Total	**68**	**100%**	**100%**	**100%**

Source: Authors' computation

Additionally, 14.7% of respondents reported a lack of knowledge or digital skills, while 13.2% pointed to poor internet connectivity as a barrier. These findings are consistent with existing literature, such as Okocha and Dogo (2023), who found that infrastructural limitations and inadequate training significantly hinder digital literacy development among Nigerian youth, particularly in underserved communities. Furthermore, a smaller proportion (10.3%) expressed fear of making mistakes when using digital tools, highlighting psychological barriers such as low self-efficacy and technophobia, which also feature in

studies by Abubakar (2024), who emphasize the importance of building digital confidence through structured mentoring and supportive learning environments.

Enhancing Digital Literacy Development through Mentorship

Concerning Objective 3 the results in Table 5 show a highly positive impact of the mentorship initiative. An overwhelming 98.5% of participants confirmed that their knowledge of digital tools had improved, and 92.6% stated they could now use new digital tools previously unfamiliar to them. Key areas of improvement included internet usage and research (47.1%), computer-based testing (13.2%), and Microsoft Office applications (11.8%). These results demonstrate a broadened competence in practical digital skills that are essential for academic and professional advancement.

Furthermore, 85.5% of respondents rated the mentorship programme as "very helpful," while 93.9% affirmed increased confidence in using digital tools. In terms of newly acquired skills, participants noted proficiency in Microsoft Word and document creation (30.9%), system troubleshooting (14.8%), and improved internet research abilities (14.7%). These outcomes align with previous research, such as Bello and Ajao (2024), which emphasized the transformative role of peer-led mentorship in closing digital literacy gaps among Nigerian youth. Similarly, Ekoko (2023) found that structured digital training significantly boosts ICT confidence, especially in underserved areas.

Table 5 Enhancement of Digital Literacy among Igbaja Youth through Mentorship

Variable	Response	Frequency	Percent (%)
Knowledge of Digital Tools Improved	Yes	66	97.1
	No	1	1.5
Ability to Use New Digital Tools	Yes	63	92.6
	No	5	7.4
Digital Skill Improvement Areas	Internet Usage & Research	32	47.1
	Computer-Based Testing	9	13.2
	Microsoft Word & Office Apps	8	11.8
	Typing Skills	7	10.3
	Basic Computer Operations	6	8.8
	Troubleshooting & Software Use	3	4.4
	Digital Device Usage	1	1.5
New Digital Skills Acquired	Microsoft Word & Docs	21	30.9
	Internet Usage & Research	10	14.7
	System Troubleshooting	10	14.8
	CBT	6	8.8
	Typing Shortcuts	6	8.8
	Digital Safety & Security	4	5.9
	Downloading & Saving Files	4	5.9
	Basic Device Operations	3	4.4
	Internet Configuration	2	2.9
	Using Search Engines	2	2.9

Table 5: Contd.

Variable	Response	Frequency	Percent (%)
Helpfulness of Mentorship	Very Helpful	53	77.9
	Helpful	5	7.4
	Unhelpful	2	2.9
	Very Unhelpful	2	2.9
Suggestions for Improvement	No Suggestions	53	77.7
	Improve Computer Ops	8	11.8
	Digital Communication	4	5.9
	CBT Training	3	4.4
	Typing/Digital Training	3	4.4
	Access to Devices	3	4.4
	Internet & Browsing	3	4.4
	Practical Sessions	2	2.9
	Infrastructure	2	2.9
	Social Media Training	2	2.9
Mentorship Feedback	Using a Computer	28	41.2
	Internet Research	25	36.8
	Creating Docs/Presentation	8	11.8
	Digital Safety & Security	5	7.4
Rating of Mentorship Quality	Excellent	52	76.5
	Good	12	17.6
	Fair	2	2.9
Challenges Faced	Inadequate Access to Devices	38	55.9
	Difficulty Understanding	15	22.1
	Lack of Time	10	14.7
Feel More Confident	Yes	62	91.2
	No	4	5.9
Most Useful Aspects	Internet Research	20	29.4
	CBT	19	27.9
	Computer Operation	8	11.8
	MS Word	3	4.4
	JAMB CBT	4	5.9
	Other Digital Skills (combined)	14	Varies

Source: Authors' computation

Challenges such as inadequate access to devices (59.4%) and difficulty understanding concepts (23.4%) were noted, mirroring findings from studies like those of Dosumu (2024), who highlighted infrastructural limitations as a common barrier in rural digital education. However, the high percentage of participants who reported improvement in specific skills such as using a computer (41.2%) and conducting online research (36.8%) suggests that despite obstacles, the mentorship programme was successful in promoting core digital competencies.

Participants also identified the most useful aspects of the mentorship, including internet usage and research (29.4%), general CBT training (27.9%), and computer operations (11.8%), reinforcing the relevance of the programme content. These findings are consistent

with the argument by Lee and Yaprak (2022) that localized, practical mentorship can bridge the digital divide when it aligns with the contextual needs of beneficiaries.

Estimating the Impact of the Mentorship Programme on Digital Literacy

Table 6 shows the estimates of the impact of the mentorship programme on digital literacy obtained via a difference-in-differences regression model (Equation 1). This model isolates the effect of mentorship participation by comparing digital literacy scores before and after mentorship intervention. From the result, participation in the mentorship program alone (Ment) had a significant and large positive coefficient (0.714, p = 0.000), indicating that those who participated generally had higher digital literacy scores after participation. The variable *Post* (indicating the time after the intervention) also showed a positive and significant coefficient (0.216, p = 0.027), suggesting that overall digital literacy scores improved after mentorship.

Table 6 Regression Results of Mentorship (Pre and Post) Impact on Digital Literacy

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*P-value*
Ment (1 = Yes)	0.714	0.125	5.69	0.000
Post (1 = After)	0.216	0.119	2.32	0.027
Ment × Post (Effect)	0.048	0.024	2.00	0.031
Constant	2.790	0.110	25.43	0.000
R-squared	0.812			

Source: Authors' computation using Stata 18

The interaction term (Post × Ment), which directly measures the programme's impact on digital literacy, was statistically significant with a coefficient of 0.048 (p = 0.031). On the average, digital literacy level of the participants increased by 0.048 units after the mentorship programme. Therefore, mentorship had a significant positive impact on digital literacy. The results are in line with previous studies such as Abubakar (2024) who reported that structured digital literacy initiatives, particularly those incorporating peer or near-peer mentorship, improved digital navigation skills and technology adoption among Nigerian youth.

Conclusion

This study sought to measure, evaluate, and enhance digital literacy through youth mentorship in Igbaja, Ifelodun local government area of Kwara State, Nigeria. Drawing on technology acceptance model, the study examines the impact of mentorship programme on digital literacy development among youth in Igbaja and establishes that the mentorship programme was very impactful.

The study contributes valuable insights into the state of digital literacy in rural Nigeria and offers practical recommendations for youth empowerment through targeted mentorship initiatives. Ultimately, the findings informs policy development, educational practices, and

community-based programmes aimed at enhancing digital literacy, reducing the digital divide, and promoting digital inclusion and inclusive growth. This will, in turn, help achieve parts of the sustainable development goals (SDGs 4, 8, 9 10, and 11). By evaluating current digital literacy level and implementing a targeted mentorship intervention, this study generated actionable findings that can inform localized and potentially scalable strategies for digital empowerment.

Furthermore, the study's mentorship-based approach represents an innovative intervention model. Unlike traditional top-down digital literacy programmes, this research proposes a collaborative, youth-centered approach that recognizes local knowledge, respects community dynamics, and leverages interpersonal learning strategies. This approach not only addresses skill deficits but also builds technological confidence and self-directed learning capabilities among rural youth. Therefore, policymakers should integrate practical digital skills into school curricula and establish community digital hubs to sustain literacy gains. They should employ train-the-trainer mentorship models for community scalability, and embed mentorship within rural digital education frameworks.

Besides, existing research has predominantly focused on digital literacy challenges in urban settings, with limited empirical evidence exploring the digital literacy of youth in specific rural Nigerian. By concentrating on a rural area, this study offers detailed, tailored perspectives on digital literacy strategies that could be applied to comparable rural settings (Livingstone & Third, 2022). Hence, future action research should explore other rural areas in the country. By localizing mentorship-driven models, Nigeria can not only narrow the digital divide but also empower rural youth as digital citizens.

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