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Assessment of Digital Literacy and Technology Utilisation among Secondary School Students in Ilaro Metropolis, Ogun State, Nigeria

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Abstract

This study examined the digital literacy levels and technology utilization among secondary school students in Ilaro metropolis, Ogun State, Nigeria. Three research questions were raised and answered, using a descriptive survey method as the research design. data were collected from 210 students across six schools through a structured questionnaire. The instrument was validated and the reliability index obtained was 0.76. The findings revealed a moderate digital literacy among students, the students are using digital technologies in the school and factors like high device costs, limited access to infrastructure, and inadequate training opportunities within schools were identified as barriers affecting the use of digital technologies. Among the recommendations was to enhance digital literacy, making digital infrastructure available in the schools.

Keywords Digital Literacy, Digital Technologies, Utilisation, Digital Infrastructure

Introduction

Technology integration in every sector is rising, and education is no exception. There has been a significant shift in the teaching-learning process in the past few years with digitalization in education. The transformation of all information types (texts, sounds, visuals, video, and other data) of digital language can be termed digitalization (Machekina, 2017). In comparison, Keane (2012) divided digital learning into four components: digital teaching material, digital tools, digital content delivery, and autonomous learning. Koh (2016) stated that a new level of personalized learning was created to integrate technology into the education process. The use of digital technologies presents numerous opportunities for teacher teaching and student learning. In an article, Johari (2017) stated that digitalization in education has made the teaching-learning process stress-free, broad, and more participatory. Schools are gradually implementing digital learning solutions like Smart Interactive boards, laptops, interactive screens, projectors, and an internet connection to support teaching-learning. Digitalization in education can be felt by increasing accessibility, availability, and usage of digital devices in the early years of the student's life. In other words, the learner needs digital literacy skills to use digitalization in education effectively. Information and Communication Technology (ICT) has led all processes based on information, therefore there is a need for

every individual in the country to be digitally literate and technology competent (Oshin & Badmus, 2018).

Digital learning media such as web, blog, video, and multimedia can be used for all primary, secondary, and higher education subjects. This digital media can be defined as a tool/learning platform or application designed for teaching and learning. Digital learning media can facilitate and stimulate students' cognitive skills with a more meaningful learning experience (Paidi *et al.,* (2021; Sidauruk *et al.,* 2021). Digital media is essential in the learning process because it can package the material to be more contextual, interesting audiovisual, reduce verbalism, and be more interactive (Rusydiyah *et al.,* 2020). Technology-based media uses digital tools that need computers and mobile phones as supporting devices. Using digital learning media also aimed to increase students' writing and computer skills, digital skills, interactive, responsive, and share knowledge to enrich learning experiences and resources (Nelson *et al.,* 2011). Regarding digital learning in the 21st century, digital media is proposed to improve student engagement involvement and enhance knowledge and competencies (Purwadi *et al.,* 2020). The use of digital media in learning is an effort to grow student interest, motivation, attractiveness, digital literacy, and student learning outcomes.

Digital literacy refers to the learners' skills in searching for information on the internet browser and operating various software tools (Buckingham, 2010; Law *et al.,* 2018). Digital literacy is not only just understanding how to use technology but also knowing the benefits of the tools and when to utilize them (Alexander *et al.,* 2016), having the capability to organize information, and critical and creative thinking skills (Law *et al.,* 2018). There are twenty aspects related to digital literacy as follows: information research and retrieval, information evaluation, learning resources, utilization tools, data transmission, information communication, social responsibility, authorization of digital information, choosing appropriate computing devices, systems analysis, system design, tools development, programming, security of data and the information, security of financial and personal identity, administration of the database, data management, networking, computer technology; photography and digital video (Nelson *et al.,* 2017). Aspects of digital literacy competencies include capability in utilizing technology, applying technology to acquire, assess, create, and communicate information (Oh *et al.,* 2021*).*

Digital literacy skills are a particular set of competencies that allow an individual to fully function and participate in a digital world by understanding, finding, utilizing, and creating information from various internet sources. Over time, the advancement of technology has modified the meaning of digital literacy. In some researcher works digital literacy is the ability to understand and use information when presented via computers. Digital literacy is the ability to navigate various digital platforms and understand, assess, and communicate through them. In an article, Phuapan *et al.,* (2015) argued that digital literacy means using digital technology, communication devices, and networks in digital environments to survive in the digital world successfully. According to them, the

essential elements required to attain digital literacy skills are accessing, managing, integrating, evaluating, creating, communicating, analyzing, and synthesizing through digital devices.

Teachers worldwide are encouraged and expected to implement Information and Communication Technology (ICT) in instruction as it now places high demand on education. However, teachers might find it difficult to know how to use the Internet in the classroom. Researchers assert that most teachers in Nigeria lack pedagogical knowledge of effective utilization of ICT resources for teaching in Nigeria (Adikwu, *et al.,* 2018, Nwana *et al*., 2017; Onasanya, 2010; Yusuf *et al.,* 2013; Yushau & Nannim, 2018). It was also observed that graduates who are hired to work in companies have difficulties manipulating basic ICT tools (Okolocha & Onaigho 2015). There were indications that ICT facilities and digital literacy were not adequately utilized in schools. Students are also seen enrolling in roadside computer centers to acquire knowledge of ICT skills and to be relevant to this digital age. In 1988, the Federal Government of Nigeria introduced computer education.

Statement of the Problem

Despite the National Policy on Education, NPE (2004) recognizing ICT as a product of technological change and innovation in education which called for the integration of computer studies into the curriculum and made the study a compulsory subject in secondary schools, there is still a huge gap in the literacy and utilization of ICT resources in schools.

The Ogun State Government's efforts towards the digitalization of education in all schools have always been discussed in the system, but some secondary schools in the state, particularly in Ilaro metropolis, have not been able to witness this development. Recently, scholars in the field of educational measurement and evaluation have advocated switching all Paper-Based Tests/Exams to Computer-Based Tests (CBT) to further extend the like of JAMB which is completely using CBT as a means of conducting her examination. Some of the digital devices available in some schools are underutilized because digital literacy is lacking among the teachers and students and some secondary schools do not have these digital technologies for both the teachers and students to use.

Since the digitalization of education has come to stay there should be reasons to justify the schools' readiness, digital literacy and technology utilization in secondary school. What we need to know is, if the students are digitally literate, if available the technologies are utilized and what are the like factors hinder the digital utilisation in the school. Therefore, this study assessed the digital literacy level and utilization of digital technologies among secondary school students in Ilaro metropolis, Ogun State, Nigeria.

Objectives of the Study

The purpose of this study was to assess digital literacy and technology utilization among secondary school students in Ilaro metropolis, Ogun State, Nigeria. Specifically, this study;

1. Assess the level of digital literacy among secondary school students.
2. Investigate the level of digital technology utilization among secondary school students.
3. Identify the factors influencing digital literacy development and utilization among secondary school students.

Research Questions

The following raised research questions were answered

1. To what extent is the level of digital literacy among secondary school students in Ilaro metropolis?
2. To what extent do secondary school students utilize digital technologies in their schools for academic purposes?
3. What key factors hinder digital literacy and technology utilization among secondary school students?

Methodology

This study used a descriptive survey design to collect information from the respondents who participated in the study. The target population comprised all senior secondary school students in Ogun State, particularly in Ilaro metropolis. There are twelve (12) public secondary schools in Ilaro.

This study utilized a simple random sampling technique to select six (6) schools out of twelve (12) public secondary schools available in Ilaro metropolis. Thirty-five (35) senior secondary school students (SS2) participated in the study and were selected using a simple random technique in each of the schools, therefore making two hundred and ten (210) students serve as respondents. In this level of class, i.e. SS2 class, have gained enough experience to understand the facilities available in the school, the styles of teaching among the teachers, instructional materials provided by school management and government to facilitate their learning, and the presence of digital technology or computer laboratory in their various schools. In all 112 (one hundred and twelve) male students and 98 (ninety-eight) female students were involved in the study. Table 1 displayed the names of the schools and numbers of the students.

Table 1: Participated Schools in Ilaro Metropolis

S/N	Schools	Nos
1	Promising Generation Secondary School, Ilaro	35
2	Itolu Community Secondary School, Ilaro	35
3	Yewa (Egbado) College, Ilaro	35
4	Ansar-ud-Deen Model Academy, Ilaro	35
5	Okepata Secondary School, Ilaro	35
6	Orona High School, Oke-	35
	Total	210

The questionnaire used to collect data for this study was a researcher-developed one. The questionnaire has two sections (A and B). Section A contained information on respondents' bio-date while section B has items that were used to collect information from the respondents to answer the stated items. The items were measured using Likert's rating scale from strongly agree (SA), agree (A), disagree (DA) to strongly disagree (SD).

The instrument was subjected to face and content validity. Three experts were used to validate the instrument, one from education technology, one from ICT, and one from educational evaluation. Their suggestions and observations were effectively taken care of before the final production of the instrument was made for distribution. The reliability coefficient was achieved through the use of Cronbach alpha and an index of 0.76 was obtained.

The questionnaire was administered with the help of researcher assistants. In each of the participating schools, a researcher assistant was used and helped to distribute and collect the questionnaire back from the respondents. It took two weeks to complete the administration of the collection of data. The analysis of the data collected was made with the use of simple frequency distribution, percentage, means score, and standard deviation through the aid of the Statistics Package for Social Science.

Results

The results of this study are presented according to the research questions as follows:

Answers to the Research Questions

Research Question 1: To what extent is the level of digital literacy among secondary school students in Ilaro metropolis?

Table 2: Level of Digital Literacy among Secondary School Students in Ilaro Metropolis

S/N	Items	SA		A		D		SD		Mean	Std. Dev.
		No	%	No	%	No	%	No	%		
1.	I am confident in my digital skills, such as using social media (Facebook, Twitter, Instagram, etc.)	72	34.3	81	38.6	37	17.6	20	9.5	2.98	0.951
2.	I am confident in digital skills like using search engines (e.g. Google, etc.)	92	43.8	88	41.9	12	5.7	18	8.6	3.21	0.893
3.	I use the internet for academic purposes daily	83	39.5	75	35.7	29	13.8	23	11.0	3.04	0.987

4.	I am confident in digital skills like creating documents (e.g. Word processing, Power presentation, etc.)	69	32.9	92	43.8	32	15.2	17	8.1	3.01	0.899
5.	I do send and receive emails (Gmail, Yahoo emails, etc.)	85	40.5	63	30.0	41	19.5	21	10	3.01	1.002
6.	I can download educational resources (Research Gates, Academia, etc.)	77	36.7	68	32.4	41	19.5	24	11.4	2.94	1.010
7.	I have received formal training on how to use digital devices for academic purposes	62	29.5	79	37.6	39	18.6	30	14.3	2.82	1.013
8.	My teachers incorporate digital tools in their teaching (e.g., using projectors, digital boards)	64	30.5	69	32.9	48	22.9	29	13.8	2.80	1.025
9.	I can search for online information without assistance	56	26.7	68	21.9	46	21.9	40	19.0	2.67	1.069
10.	I can operate different digital devices like smart phones, computers and others	60	28.4	75	35.7	32	15.2	43	20.5	2.72	1.089
					Grand Mean	**=**	**2.92**				

Table 2 revealed that the obtained grand mean score of 2.92 is above the mid-point of 2.5. The mean scores of all the items measured were above 2.5 and the implication is that secondary school students in Ilaro metropolis are literate in terms of digital knowledge. The level of digital literacy is average not high but moderate.

Research Question 2: To what extent do secondary school students utilize digital technologies in their schools for academic purposes?

Table 3: Level of Secondary School Students Utilization of digital technologies for Academic Purposes

S/N	**Items**	**SA**		**A**		**D**		**SD**		**Mean**	**Std. Dev.**
		No	**%**	**No**	**%**	**No**	**%**	**No**	**%**		
1.	I can utilize electronic devices including desktop computers, laptops, mobile phones, and tablets available in the school	68	32.4	76	36.2	19	9.0	47	22.4	2.79	1.127
2.	I often use Google search, educational apps, online classes, E-books, etc. for my academic work	42	20.0	36	17.1	67	31.9	65	31.0	2.26	1.104
3.	I frequently use digital tools for completing school assignments	38	18.1	41	19.5	72	34.3	59	28.1	2.28	1.063
4.	I can locate and assess information online using school computer	46	21.9	39	18.6	81	38.6	44	21.0	2.41	1.051
5.	I participate in internet forums and communities in the school for my academic pursuits	31	14.8	21	10.0	79	37.6	79	37.6	2.02	1.035
6.	I use network with other	41	19.5	28	13.3	92	43.8	49	23.3	2.29	1.033

	students in my academics via computer										
7.	I do not use computer system in the school for my class work	46	21.9	30	14.3	80	38.1	54	25.7	2.32	1.085
8.	I do not see any of my teacher using digital devices to teach.	65	31.0	56	26.7	61	29.0	28	13.3	2.75	1.038
9.	No digital boards to collect on internet to get more information in the school	57	27.1	61	29.0	47	22.4	45	21.4	2.62	1.101
10.	I find and evaluate online information in the school	52	24.8	58	27.6	57	27.1	43	20.5	2.57	1.075
	Grand Mean = 2.43										

Table 3 showed that the grand mean score obtained was 2.43 which is below the mid-point 2.5. From the Table, it was revealed that except for items 1 (2.79), 8 (2.75), 9 (2.62), and 10 (2.57) their mean scores were above 2.5, all other items are below the mid-point. This implies that students are not using digital technology in schools for their learning.

Research Question 3: What key factors hinder digital literacy and technology utilization among secondary school students?

Table 4: Factors Hinder Digital Literacy and Technology Utilization among Secondary School Students

S/N	Items	SA		A		D		SD		Mean	Std. Dev.	Decision
		No	%	No	%	No	%	No	%			
1.	The cost of devices is high to acquire	81	38.6	69	32.9	32	15.2	28	13.3	2.97	1.037	Agreed
2.	Lack of access to computer labs in the school	72	34.3	68	32.4	43	20.5	27	12.9	2.88	1.026	Agreed
3.	Lack of access to digital technologies like computer systems	63	30.0	56	26.7	42	20.0	49	23.3	2.63	1.142	Agreed
4.	Lack of skills to solve technical problems	78	37.1	63	30.0	34	16.2	35	16.7	2.88	1.091	Agreed
5.	Lack of training sessions from the school	69	32.9	56	26.7	56	26.7	29	13.8	2.79	1.052	Agreed
6.	Unavailability of internet facilities and accessibility	65	31.0	64	30.5	36	17.1	45	21.4	2.71	2.71	Agreed
7.	No programme available from the government to improve my digital skills	71	38.8	69	32.9	42	20.0	28	13.3	2.87	1.030	Agreed

From Table 4, it showed that all the mean scores were above the 2.5. All the items are agreed to the stated items. The high cost of digital devices (2.97), lack of access to computer labs in the school (2.88), lack of access to digital technologies to work with in

the school (2.63), no skill to solve technical problems (2.88), no training in the school for digital knowledge (2.79). the internet facilities (2.71) and lack of government intervention (2.87) to improve digital skill contribute to the challenges.

Summary of the Findings

The following is the summary of the major findings:

1. Digital literacy among students is generally moderate, secondary school students in Ilaro metropolis are literate in terms of digital knowledge.
2. Students are not using digital technology in schools for their learning.
3. Key factors influencing digital literacy include access to devices and internet connectivity, while insufficient infrastructure hinders broader usage in academic settings.

Discussion

The findings of this study align with existing literature, suggesting that digital literacy is becoming an essential skill for academic success in the digital age. The positive correlation between digital literacy and academic performance supports previous research (Adedoyin & Oyelekan, 2021) highlighting digital competence's importance in students' learning outcomes. Digital literacy among students is generally moderate, secondary school students in Ilaro metropolis are literate in terms of digital knowledge. This finding is line with Gupta and Kumar (2024) in their study concluded that a large proportion of sampled students showed an average level of digital literacy and little difference(s) were reported in the percentage of male and female students under the different levels of digital literacy. This might be as a result of students' usage of social media and search engines most often. This indicates a digital skill gap for academic use, likely due to limited formal training and resources in digital literacy.

The study found that students are not using digital technologies in the school for their academic pursuit. This finding might contradict the study of Little (2014) who agreed that using mobile devices may not be disruptive to learning environments under conditions in which the cognitive load is not too heavy.

The key barriers include the high cost of devices, lack of access to computer labs, and inadequate school infrastructure. These factors limit students' availability and use of technology, affecting their ability to develop digital skills for learning. Additionally, lack of teacher support and insufficient training sessions contribute to limited growth in digital literacy.

Conclusion

This study concludes that digital literacy is an essential component of modern education, directly affecting the academic performance of secondary school students. While access to digital tools is improving, there are still substantial gaps in utilization, especially in the use of digital resources for academic purposes. Addressing these gaps is crucial for enhancing the overall educational experience.

Recommendations

Based on the findings of the study the following recommendations emerged;

1. The government and schools in Ilaro should prioritize the development of digital infrastructure, including more computers, projectors, and internet access. This will further encourage the students to use digital devices not only for entertainment but for their study.

2. Government at all levels should make available the digital technologies in the schools for students to use. The era of traditional method of teaching has fade out, however, it is imperative for the students to familiar and use these digital gadgets to complement their conventional learning style.

3. Education can grow when there is adequate equipment, available funds, adequate instructional infrastructure and many others in the schools. Government and stakeholders in education should contribute immensely in terms of provision of physical structure in the schools.

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