ISSN: 2790-4407

Journal of Computer Adaptive Testing in Africa

2022; 1, 1-14

Assessment of Public Primary School Teachers Computer Literacy and Usage in Teaching and Learning

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ABSTRACT

Education has become more involved in information and computer technology (ICT) because of rapid and expanding technical breakthroughs worldwide. The demand for computer literate teachers has increased in the modern world, and this demand can be met by incorporating ICTs into education. This study was supported by the diffusion of innovations theory, intended to determine teachers' levels of computer literacy and the use of ICTs in teaching and learning. This study examines teachers' level of computer literacy and use in teaching and learning at public primary schools in Lagos Mainland Local Education District, Lagos State, Nigeria. The study adopted a mixed-methods research approach (qualitative and quantitative methods), with a suitable sample of eighty (80) public primary school subjects' teachers. Data was collected via an open-ended questionnaire. The quantitative data was statistically evaluated, while the qualitative data was content analysed. The study discovered that ICTs were not used in teaching and learning for a variety of reasons. The study concluded that, in modern-day life, some public primary schools were far from improving teaching and learning by integrating ICTs. The study recommended that the government endeavor to sponsor teachers to workshops and conferences, particularly computer workshops, and offer computer products to schools so that teachers can easily access computers when needed.

Keywords: ICTs usage, teaching and learning, teacher's literacy

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To cite this article:

Ogunbayo, S. B. & Mhlanga, N. (2021). Assessment of Public Primary School Teachers Computer Literacy and Usage in Teaching and Learning. *Journal of Computer Adaptive Testing in Africa, 1*, 1-14.

Received: 3 June 2021
Accepted: 10 November 2021
Published: 21 June 2022

INTRODUCTION

The world is fast changing in the disciplines of information, communication, and technology (ICT). The teachers have had to adjust to fit into these changes in the teaching and learning of students. According to Asoma (2018), computer literacy is required in practically every aspect of modern life. As a result, today's teachers must be exceptionally computer literate in order to assist students in integrating into contemporary society. Asoma (2018) stated further that computing is becoming increasingly important in early childhood education as young as five years old. Teachers should keep up with computer development to guarantee that learners' requirements are met early. Using computers in teaching and learning is critical since it boosts learners' interest in computers (Bello, 2017).

Education has become more involved in information and computer technology due to rapid and expanding technical breakthroughs around the world. Incorporating ICTs into teaching represents a substantial shift in society's demands. The demand for computer literate teachers has increased in the modern world, and this demand can be met by incorporating ICTs into education. ICT knowledge and skills are essential for education, modern jobs, and career chances (Tsai et al. 2019). As a result, ICTs must be introduced to all primary school students at the early stage of their lives (Bell, 2017).

Teachers must have adequate computer literacy abilities to employ electronic information systems in their teaching and learning effectively. This action has indicated the need for teachers to participate in computer literacy training and improve their skills. Even the most common operations in educational applications necessitate basic computer skills. Aworanti (2016) proposed that in different countries worldwide, societal standards and computer skill levels have varying needs for computer literate people. Acquiring computer skills is more crucial today than ever before, particularly in developing countries (Baş et al., 2016). They stated further that in order to use a computer as an educational tool to accomplish the goals of teaching and learning, teachers must have sufficient computer knowledge.

LITERATURE REVIEW

Various studies have been conducted on the importance of computer use in teaching and learning school students. Gebremedhin and Fenta (2015) researched assessing teachers' computer literacy in teaching and learning. The findings show that computer literacy and use will aid teachers inefficiently in teaching and learning. According to Bhebheand (2016), recreation centers have been developed to

guarantee that teachers and students have access to computers in first-world nations. They went on to say that computer use in education is an important part of ICTs use in the classroom. Similarly, Lawrence and Tar (2018) conducted studies in Turkey on the problems of using ICTs in teaching and learning, and the findings show that the use of ICT in schools is limited by a lack of computers knowledge and skills. Without the expertise and abilities of teachers, integrating ICTs into teaching and learning is exceedingly difficult (Lawrence & Tar, 2018).

Furthermore, ICTs are also important in education since they give a modern way of gathering and storing data that can be shared. Electronic information systems allow teachers to access learning instruction materials via the Internet (Li & Lee, 2016). This enables teachers, academicians, and researchers in education to collaborate and share ideas (Aworanti, 2016). Eickelmann and Vennemann (2017) stipulated that those educational researchers use ICTs to transmit, display, store, and evaluate data. In both public and private schools, information, and communication technology (ICT) in education has resulted in favourable changes. Adequate infrastructure and ICT equipment, including electricity, hardware, Internet connectivity, and educational software such as keyboards, printers, projectors, computers, and scanners, have enabled ICT to affect education El-Halawany (2018) positively. Teachers must recognise and discover strategies to optimise ICTs in teaching and learning to help students (Steiner & Mendelovitch, 2017).

Recently, there has been an increasing emphasis on incorporating technology into the curriculum, particularly at the primary school level (Eickelmann & Vennemann2017). Computers, Disc players, audio and video cameras, and televisions, are all examples of technology used in the classroom (Dauda & Samaila, 2019). Dauda and Samaila (2019) discussed further how classroom technology could assist teachers in various ways, such as assessing, using, altering, and presenting the information. The use of computers as part of ICTs in the educational process is a helpful transition from traditional teaching methodologies in education (Gebremedhin & Fenta, 2015). As a result of this shift, which has resulted in significant changes in the educational process, learners' usage of computers has become a prerequisite (Ettu, et al., 2016). Ettu et al. (2016) affirmed further that computer use in education brings up a new field of knowledge and gives a tool that can revolutionise some current instructional practices. Computer use is on the rise in society, which means that teachers must likewise prepare for computer use in the classroom. Ghavifekr et al. (2016) opined that computer could be used by persons of all ages and at all levels of education. Ghavifekr et al. (2016) stated further those researchers and

teacher could receive the knowledge they need to study, teach, and learn by using a computer to access the internet.

Studies have shown that teachers' use of the computer might result in variations in the teaching process, implying that they are successful (Kim & Lee2020). They stated further that while teachers enthusiastically embrace technology advancements, only a small percentage use it successfully. Similarly, Li and Lee (2016) argued that personal usage of ICT outweighs other uses such as educational and managerial objectives. Kretschmann (2015) affirmed that using ICTs is crucial for students because it adds to society's future career opportunities and local and national developments. According to the Final EU Study Report for February 2013, using ICTs in teaching and learning improves teachers' professional development opportunities and boosts their self-esteem and confidence (Valtonen, et al., 2015).

Additionally, the Federal Ministry of Education established the National Policy on Information and Communication Technologies (ICT) in Education. According to Olusegun (2017), in recognition of the necessity to realign Nigeria's education industry to match global standards and competitiveness, the policy strives to ensure high-quality education in order to promote long-term socioeconomic development, global competitiveness, and an individual's ability to thrive in today's world. The Policy also lays out the necessary expectations for the entire ICT integration process in education. Its implementation is predicted to result in rapid changes in Nigerian teaching, learning, and educational administration. These efforts aim to improve public primary schools' learning using the computer (Ugwu & Ohimekpen, 2015).

It's important to note that, despite all the attempts to develop and disseminate computer literacy among teachers, the impact of computer education has yet to be felt in many public primary schools (Makhmudov, et al., 2020). Poor education and literacy levels, poor awareness about technology capabilities, and a lack of skills to build and utilise ICT packages are significant barriers to adoption, even when the physical and school facilities are available (Mensah & Agyei, 2021). Mensahand and Agyei (2021) claimed further that the present public primary schools do not give adequate computer training for teachers to use computers in teaching their classes confidently.

However, in Nigeria, the use of ICT to facilitate teacher education is still widespread since many teachers are not ICT literate, and those in training are not fully exposed to the use of ICT in skill acquisition and practical teaching (Olawale, 2018). As a result, determining the readiness of public

primary school teachers in Lagos Mainland Local Education District of Lagos State, Nigeria, necessitates a necessary assessment of teachers' computer literacy and state of computer usage.

Objective of the Study

The purpose of this study was to:

1. Examine teachers' level of computer literacy and use in teaching and learning at public primary schools.
2. Explore approaches to improve teachers' computer literacy and use in teaching and learning at public primary schools.

Research Question

1. What are the teachers' levels of computer literacy and use in teaching and learning at public primary schools?
2. How could teachers' computer literacy and use in teaching and learning at public primary schools be improved?

Theoretical Framework

This study adopts the innovation diffusion theory (IDT) of Rogers (1995). The theory stated that when an individual integrates an invention into their life, the diffusion process occurs. Diffusion is defined as the communal adoption process through time (Rogers 1995). According to Straub (2009), innovation-diffusion theory refers to the process of a new idea spreading over time. This means that when new ICTs are developed outside of the classroom, teachers and students should be shown how to use them to improve teaching and learning. According to Rogers and Shoemaker (1971), innovators, early adopters, early majority, late majority, and laggards are the five categories into which adopters fall based on their innovativeness. The figure below illustrates the five categories of Roger's innovation diffusion theory (IDT) related to the public primary school teachers' adoption of computer literacy.

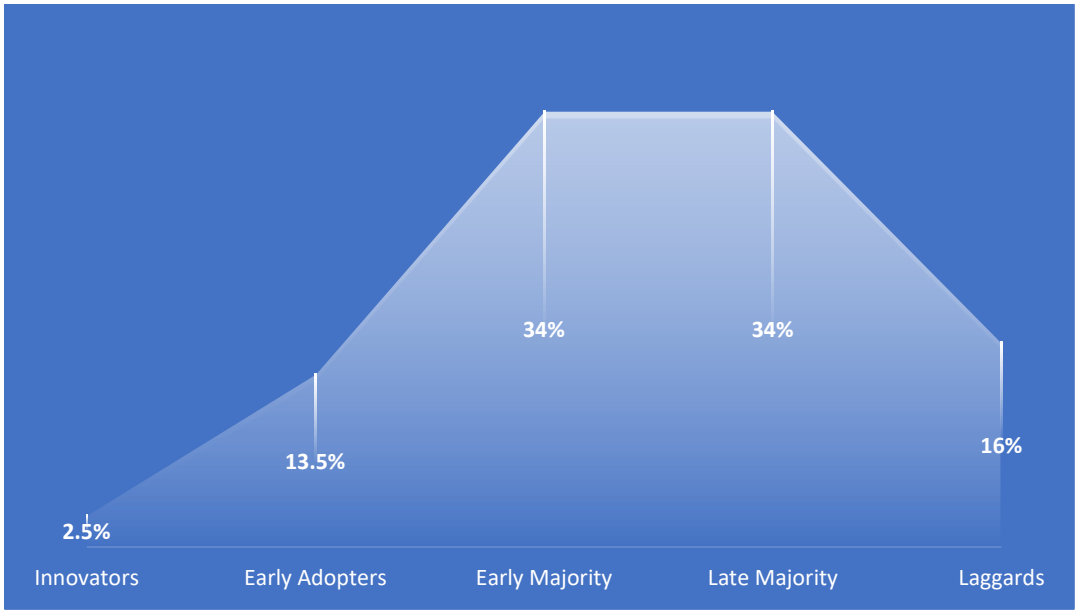

Figure 1: Innovation Diffusion Theory (IDT)

Source: Adapted from Straub (2009)

Straub (2009) Indicated that the five categories of innovation diffusion theory might be traced back to teachers' computer literacy, accessibility, and technology use. He stated further that analyzing previous technological studies can provide some markers that signal shifts between the five categories of adoption. As shown in Figure 1, teachers' computer literacy adoptions are classified into five categories according to the innovation diffusion theory. The innovators are the initial users of a new product. They are the first 2.5% of buyers to accept a new concept, while the early adopters are the next 13.5%. They are community opinion leaders who adopt new items early yet cautiously.
Similarly, the early majority are deliberated. They accept a new product before the ordinary individual, even though they are rarely leaders. They are responsible for the remaining 34% of new entrants into the market, while the late majority is pessimistic. They only adopt a new idea when many individuals have tried it. This group accounts for another 34% of the entire market. Lastly, the laggards are tradition-bound. They are only skeptical when it has become a tradition in and of itself. The final 16% of customers are those who have yet to make their purchases.

However, the innovation diffusion theory is relevant to this study because teachers' willingness to test new products like ICTs varies substantially. They can be classified as innovators, early adopters, early majority, late majority, or laggards based on their exposure, belief, attitude, lifestyle, and income. This

implies that teachers and learners should accept ICTs, regardless of their levels or rates of adoption, to guarantee that schools do not fall behind global advances to prepare them for life beyond school successfully.

MATERIAL AND METHODS

This study was carried out among the subject teachers in five (5) selected public primary schools in Lagos Mainland Local Education District, Lagos State, Nigeria. Semi -structure questionnaires were administered to 16 teachers among the five selected schools. The respondents were 80 public primary teachers, including English language, mathematics, basic science, civic education, home economics, social study, and business study teachers. In this study, data were collected using semi-structured questionnaires. Open-ended questions with explanations are included in a semi-structured questionnaire. They hope to generate more extensive replies from participants, including narrative stories and personal experiences.

The researcher obtained both quantitative and qualitative data using the semi-structured questionnaire, which was in line with the mixed-method approach used in the study. Usage of computer literacy proforma was also used to generate data from the participants. The semi-structured questionnaires were divided into two sections. The first section shows the descriptive analysis of the study, while the second section reveals the indices of the study. This study examined public primary school teachers' computer literacy and ICTs use in teaching and learning. The data was statistically analysed using SPSS version 27. Tables, frequencies, and percentages were used to show the data. There is also a thorough explanation of the facts presented.

RESULTS

Table 1: Descriptive analysis of Participants (n=80)

Variables (V)	Frequency (F)	Percentage (%)
Respondents Designation		
Basic science teachers	15	18.75%
Mathematics teachers	13	16.25%
Home economics teachers	14	17.5%
Business studies teachers	15	18.75%
Social studies teachers	12	15%
English language teachers	11	13.75%
Total	80	100%

Academic Qualification		
M. Edu/M. Sc	10	12.5%
B. Edu/B. Sc	40	50%
NCE	30	37.5%
Total	80	100%
Teaching Experiences		
5- 15 years of experience	13	16.25%
16- 25 years of experience	42	52.5%
26 and above years of experience	25	31.25%
Total	80	100%
Gender		
Male	35	43.75%
Female	45	56.25%
Total	80	100%
Age		
25-35 years	26	32.5%
36-45 years	15	18.75%
46-55 years	29	36.25%
56 years and above	10	12.5%
Total	80	100%

Table1 revealed the respondent's designation in the public primary schools sampled within the study. The result indicated that 18.75% (15) of the respondents were for both basic science and business study teachers, 17.5% (14) of the respondents were home economics teachers, 16.25% (13) of the respondents were mathematics teachers, 15% (12) of the respondents were social study teachers, and 13.75% (11) of the respondents were English language teachers. Also, the educational qualifications of the respondents revealed that 50% (40) of the respondents had B. Edu and B.Sc., 37.5% (30) NCE, and 12.5% (10) had M.edu and M.Sc. Furthermore, the teaching experience of the respondents showed that 52.5% (42) of the respondents had 16-25 years of experience, 31.25% (25) had 26 and above years of experience, and 16.25% (13) had 5-15 years of teaching experience while the gender of the respondents revealed that 56.25% (45) of the respondents were female teachers, while 43.75% (35) were male teachers. Lastly, the age of the respondents indicated that 36.25% (29) of the respondents

were between the age of 46-55, 32.5% (26) of the respondents were between the age of 25-35, 18.75% (15) of the respondents were between the age of 36-45, and 12.5% (10) of the respondents were between the age of 56 years and above.

Table 2: Teachers Computer Literacy (n=80)

Variables	Yes	%	No	%
Computer literacy	47	59	33	41
Formal training in computer	30	37	50	63
Computer training during teacher training	39	49	41	51
Ability to use Microsoft word	48	60	32	40
Ability to use PowerPoint	15	19	65	81
Ability to do internet searches	45	56	35	44
Having a working email account that is functioning	30	37	50	63
Possession of laptop/smartphone	36	45	44	55
Internet access in school	10	13	70	87

Table 2 shows that the majority, which constitutes 87% (70) of the respondents, indicated that they do not have access to school internet, while 81% (65) of the respondents do not know how to use PowerPoint. Other notable factors were that 63% (50) of the respondents do not have an active email account and formal computer training, while 60% (48) of the respondents can use Microsoft Word. Similarly, 59% (47) showed that they were computer literate, while 56% (45) of the respondents could search the internet, and 55% (44) of the respondents did not possess a laptop or smartphone. The result of the study further revealed that 51% (41) of the respondents did not have computer training during teachers' training. The study results indicated that ICTs in public primary schools in Lagos Mainland Local Education District, Lagos State, Nigeria, are ineffective. According to the findings of this study, teachers who do not have access to the internet at school cannot be encouraged to learn how to use PowerPoint in teaching and learning or acquire a laptop or smartphone.

Table 3: Usage of Computer (n=80)

Questions	Yes	%	No	%
Printing and typing of lesson notes for students	35	44	45	56
Searching for content on internet	55	69	25	31
Presenting lessons on PowerPoint	10	12	70	88
Preparing students results using Microsoft Excel	35	44	45	56
Teaching students how to use the internet to get information	55	69	25	31
Using email to communicate with students	5	6	75	94
Using videotapes to teach students	45	56	35	44
Using audiotapes to teach students	45	56	35	44

Table 3 indicated that data collected are fairly large number of respondents, 69% (55) of the respondents both used ICTs mainly in searching for content on the Internet and teaching students to use the internet to get information. However, 56% (45) of the respondents indicated that they use videotapes and audiotapes to teach students, while the majority of the respondents, 94% (75), indicated that they did not use email to communicate with their students and 88% (70) of the respondents revealed that they did not prepare students results using Microsoft Excel. Similarly, 56% (35) of the respondents revealed that they did not print and type students' lesson notes using ICT and prepare students' results using Microsoft Excel. According to the findings of this study, most respondents did not use ICTs in teaching and learning.

Table 4: Ranking in terms of usage

Rank	Area	Mean
1	Searching for content on the internet	3.45
2	Printing and typing of lesson notes for students	3.12
3	Teaching students how to use the internet to get information	2.92
4	Using video tapes to teach students	2.85
5	Using video tapes to teach students	2.84
6	Presenting lessons on PowerPoint	2.08
7	Using email to communicate with students	1.89
8	Preparing students results using Microsoft Excel	1.78

Table 4 shows the ranking of aspects of ICT usage based on mean responses. Respondents who searched for content on the internet, printed and typed lesson notes for students were highly placed, while teachers using email to communicate with students and presenting lessons on PowerPoint were weakly ranked. It is feasible to conclude that ICTs were underused. Following are some of the reasons for the inadequate use of ICTSs.

Table 5: Response from the research participants

Interview Question	**Participants Response**
Unavailability of Computer	The school does not have any computers. There is only one computer at our school. We don't have any computers at our school. We only have typewritten in our school.
Computers' Inadequacy	My school's computer resources are inadequate for huge classes. Computers are very few. There aren't many computers. It's difficult to find computer equipment.
Inaccessibility to the internet	The school does not have internet connectivity. For the past seven months, we haven't had access to the internet. We don't have Wi-Fi in our school.

Lack of ICT expertise among teachers	The majority of teachers do not have the appropriate knowledge or abilities to use modern technology. Teachers have no clue how to use ICTs in their classroom teaching. I don't know how to use a computer.
Problems with Electricity	In the school, there is no electricity. In this location, there are frequent power disruptions.

Table 5 shows that the use of ICTs in teaching and learning is a key prerequisite in today's school context. Because the society in which they live is technologically evolved, technological advancement is an elementary prerequisite that contributes significantly to students' academic and social development. Teachers and students must freely search for content on the internet, print and type lesson notes for students, use audiotapes and videotapes, and use email to communicate with students.

DISCUSSION

The study's findings show that there is less use of ICTs in some public primary schools in Lagos Mainland Local Education District, Lagos State, Nigeria. But in first-world nations, recreation centers have been developed to guarantee that teachers and students have access to computers (Bhebhe&Maphosa2016). The study of Valtonen et al. (2015) asserted that the use of ICTs in teaching and learning improves teachers' professional development opportunities while also boosting their self-esteem and confidence. According to the study's findings, the majority of the respondents were not completely using ICTs in teaching and learning. This contradicts Gebremedhin and Fenta (2015) belief that computers are part of ICTs in the educational process, and it's regarded as a helpful transition from traditional teaching methodologies in education.

The study's findings revealed that technology advancement is a necessary condition in current society and significantly impacts students' social and academic development. According to the literature evaluated in this study, the use of ICTs in teaching and learning is a basic requirement in today's school environment. Steiner and Mendelovitch (2017) back this idea by stating that teachers must recognise and discover strategies to optimise ICTs in teaching and learning to help students. According to Asoma (2018), computers are required in practically every aspect of human existence nowadays.

This study revealed that the majority of respondents said they rarely used email to communicate with their students, Kretschmann (2015) affirmed that using ICTs is crucial for a student because it adds to society's future career opportunities as well as local and national developments. The study's findings also demonstrated that teachers and learners require an atmosphere in which they are free to search the Internet for content. This is in accordance with the findings of Ghavifekr et al. (2016), who found

that using a computer to access the Internet allows researchers and teachers to get the information they need for studying, teaching, and learning.

CONCLUSION AND RECOMMENDATION

The level of computer literacy and use of ICTs by public primary school teachers in the teaching and learning of learners has been overlooked. This was due to various factors, including teacher computer illiteracy, shortages of computers, and outages of power, among others. In this respect, some public primary schools still have a long way to go integrate ICTs into teaching and learning with a world awash in technological development. The study also concluded that most schools fail to meet the necessary ICT standards for teaching and learning, denying teachers and learners access to ICT in most parts of the world. According to the report, most public primary schools' limited ICT usage failed to educate learners for the technological environment adequately they would face in the future.

Based on the findings in this study, the study recommended that the government should endeavor to sponsor teachers to workshops and conferences, particularly computer workshops, and offer computer products to schools so that teachers can easily access computers when they are needed. It is also recommended that we assess our educational policy tactics and techniques and our teaching methodology for training our teachers. Finally, ICT facilities should be made affordable so that teachers can purchase them at government-subsidised rates.

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