



Research Paper

Assessment of the Use of Technology in the Classrooms by Secondary School Teachers in Obafemi- Owode Local Government Area, Ogun State, Nigeria

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ABSTRACT

The purpose of this study was to assess the use of technology in the classrooms by secondary school teachers in Obafemi Owode- Local Government Area, Ogun state, Nigeria. This study adopted a quantitative research method. An online structured questionnaire was designed to collect data from about 500 teachers in Obafemi-Owode- Local Government. The aim was to assess the level of teachers' ICT-compliance and literacy. Only 25 respondents returned their completed questionnaires. The completed questionnaires was analysed using appropriate descriptive statistics with SPSS software version 20. The results were presented in form of charts and tables. On the issue of access to ICT in the respondents various schools, the result generally showed that aside of other identified ICTs, it is only the Internet and e-mail facilities that respondents didn't have access to. The study also shows that ICT technical support and Internet facilities are lacking in all the respondents schools, while other facilities like hardware, software, computer consumables and other ICT equipment like digital camera and data projector are adequate and available. Teachers also perceived ICT as being very useful on this study. This may be connected to the fact that it is perceived as improving learner's performance; and more so that teachers are affected by knowledge about their own subject

KEY WORDS: ICT in Education, Hardware, World Wide Web, Software, Pedagogy

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I. INTRODUCTION

Education is one of the main corner-stones for economic development and improvement of human welfare. As global economic competition grows stiffer, education becomes an important source of competitive advantage as it is linked to economic growth and ways for countries to attract investment and hence jobs[22]. Education further appears to be one of the major determinants of sustainable life-long earnings. Countries, therefore, frequently raise educational attainment as a way of tackling poverty and deprivation[24]. A well - educated and skilled workforce is one of the core pillars of the knowledge-based economies[24]. This realization makes the reforms in education and development to remain a central pre-occupation for many countries and for international development. In every country at any given level of economic development, there is a great demand for education reform in order to be able to face the prevailing political, social and cultural changes as well as scientific and technological transformations [25] Since 1990, many governments have been promoting the use of Information Communication Technologies (ICT) in education, particularly to expand access to and improve the quality of education. At the same time, globalization and shift to a knowledge-based economy requires that education institutions developing individual ability to apply knowledge in dynamic contexts. ICTs have been identified as a means to attain these objectives[20]. Although ICT is now at the center of education reform efforts, not all countries are currently able to benefit from this development and advances that technology can offer. Significant barriers often referred to as digital divide limit the ability of some countries to take advantage of technological development[10]. The developing countries are faced with challenges related to access, pedagogy or assessment when using ICTs to improve and reinforce education[10]. It is important to note that the concept, methods and application of the term ICTs are constantly evolving rapidly; starting from the popularity of the issue of computers in education in the 1980s, when relatively cheap micro-computers became available for the consumer market, later, near the end of 1980s the term was replaced by IT (Information Technology); signifying a shift of focus from computing technology to the capacity to store,

analyze and retrieve information. This was followed by the introduction of the term ICTs (Information Communication Technologies) around 1992 when email and World Wide Web (Internet) became available to the general public[16]. Though initially educators saw the use of ICTs in the classroom mainly as a way of teaching computer literacy, it has a broader role: that of delivering many kinds of learning at a lower cost and with high quality than the traditional methods of teaching allow. In addition, schools and universities increasingly use ICTs as do other large organizations, to reduce cost, improve efficiency and administration[7]. There has however been a wide disparity between the levels of investments in developed countries vis-a-vis the developing countries. [22], nonetheless states that this disparity is not necessarily a bad thing as developing countries can learn from developed countries on ICT integration. The government of Nigeria recognizes the benefits of ICT Integration in Education at all levels of education in the country. The vision of Ministry of Education Science and Technology is to facilitate ICT as a universal tool for education and training. A critical aspect to the successful implementation of ICT integration-related objectives is the planning aspect. [16], indicate that policy makers and educational planners play a central role and indicate that there are policy and planning implications in each step of implementation. Research done by[8], showed that ICT can enhance critical thinking, information handling skills, the level of conceptualization and problem-solving capacity among learners. However, most of the institutions still use nearly obsolete systems and consequently are unable to exploit educational potentials of the emerging technologies. The document also notes that most schools use less than 40% of the available infrastructure and there is; therefore, a need to ensure optimum use of ICT resources by students, teachers and administrators in order to exploit educational potential of the technology. It is, therefore, against the background of the foregoing, that the researcher sought to investigate assessment of the use of technology in the classrooms by secondary school teachers in Obafemi -Owode local Government area, Ogun State, Nigeria

1.1 STATEMENT OF THE PROBLEM

The adoption and use of Information and Communication Technology (ICT) in the public secondary schools in Obafemi-Owode Local Government, Nigeria is still under a serious dilemma despite the dramatic increase in the use of ICTs in numerous areas in present days including education. The low rate in the adoption and application of the new technologies especially in the public schools in Obafemi-Owode Local Government in Nigerian is attributed to several factors which include inadequate ICT facilities in the schools, poor ICT policies, limited information infrastructures, poor perceptions of using ICT in education among teachers, students and the school administrators. In spite of the calls and yearnings for change from the teachercentred learning to student-centred learning which involve the use of ICT resources, chalkboard and text books are still the most continuously dominant classroom facilities in virtually all the public post primary institutions in Nigeria [14]. The compelling usage of ICT in instruction and learning relies on the accessibility of these facilities and the educators' capability in utilizing them. Observation has shown that there are limited functional ICT facilities in most Nigeria public schools especially those in the rural areas. This in turn hinders the urge to use them by the students for learning. Also lack of adequate computer literacy on the site of instructors, unstable power supply and insufficient financial support are another set of deterrence militating against the successful usage of ICT facilities and resources in government-owned institutions. For that reason, the government needs to provide enough ICT resources and to train teachers on the effective utilization of the available facilities in teaching process in order to solve the problem[2]. According to[4], most of the research works on ICT in education focus on the availability of the ICT facilities and the perceptions of the use of ICT in the nation's institutions. Researchers pay less attention to the judicious use of the available ICT resources on the ground. Considering the economic, social and political status of our country and the acceptability of the western education itself, one will not expect general acceptance and the availability of adequate ICT resources in our public schools. There is widespread acknowledgment of the necessity to employ the use of the new technology in teaching and learning as we move in to the age of information technology. As of now, Nigeria is still on the negative side of the worldwide digital divide because she is yet to incorporate ICT into secondary educational modules. Most of the educational and managerial tasks in Nigeria collages are still completed physically. Probably, because there is inadequate ICT facilities, deficiency in teachers' competence or resistance from the side of the teachers. Again, it is perhaps due to lack of good policy and readiness from the side of the administrators to get along with the complexity of the 21st century. This study is considered so important especially at this present era of information age as it will look in to in-depth understanding of the current perceptions by all the stakeholders and also to understand the policies and politics surrounding the integration and application of computers in the public secondary schools in Obafemi- Owode Local Government Area of Ogun State, Nigeria.

1.2 RESEARCH QUESTIONS

1. To what extent do technology aids available for teachers in schools
2. What types of technologies are used by the teachers?
3. What are the sources of technologies used in the schools?

1.3 OBJECTIVES OF THE STUDY:

The objectives of this study are to:

1. To identify schools where technology aids are used by teachers
2. To identify the types of technology used by teachers in the classroom
3. To assess the sources of the technologies used in the school

1.4 SIGNIFICANCE OF THE STUDY

Nigeria cannot afford to not to increase her pace of development. Science and Technology education are very important in achieving this while the master key is Information and Communication Technology which must be introduced early in schools. It is therefore pertinent to investigate the level of use of ICT in teaching and learning in public secondary schools using Obafemi Owode Local Government Area of Ogun State as a case study. This study will provide information about the availability and utilization of information and communication technology amenities in teaching and learning in the public secondary schools in Obafemi - Owode Local Government Area of Ogun State, Nigeria

II. REVIEW OF RELATED LITERATURE

2.1 THEORETICAL FRAMEWORK

Piaget's Theory of Cognitive Development

Piaget believed that cognitive development occurs in different stages which change the cognitive structures. The theory of cognitive development suggested that humans learn by constructing their own knowledge while they use the information given to construct prior knowledge through prior experience to enable them to create mental images. Therefore, students should be motivated to gain more knowledge through their personal experience.

Piaget defined four stages of cognitive development as follows; sensor motor, preoperational, concrete operation and formal operation. He believed that every stage exhibits certain characteristics but for this study, the researcher is interested in formal operational stage of cognitive development. This stage is about 12 to 15 years where individuals are able to create, test hypothesis, make predictions, perform deductive and inductive reasoning, think abstractly, systematically and logically solve problem. At this stage, the child's cognitive structures reach their greatest level of development and they are to apply logical reasoning to all classes of problems. They also engage in activities requiring logical thinking, observation and measuring during experiments which allow students to control variables, collect data and draw conclusions.

In Piaget's work, hands on and mind mapping instructional strategies involves activities awareness and the capability of communicating one's rationale. These require a relativistic framework in which one's own perspective; reasoning and actions are positioned as one of many possible perspectives and competing lines of reasoning. The instructional strategies mark the progress towards Piaget's cognitive development

2.2 ICTS IN EDUCATION AND FOR EDUCATION

The idea that teaching and learning can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated, sometimes, hope and dismay and at other times, excitement and fear. Hope that many more learners can be reached at a more convenient pace that had erstwhile been the case, dismay that the infrastructures necessary for deploying an effective ICT platform is lacking in low-income countries like Nigeria[15]. ICTs for Education and ICTs in Education. ICTs for education connote the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in Education involves the adoption of general components of information and communication technologies in the teaching learning process [15]. Generally, however, the educational relevance of computers and other components of information technology cannot be overemphasized. Reference can be made to the period when skinner applied programmed instructions to teaching machines, through Brunner's experiment with computers in instruction, to the current wave of information transmission and exchange via the worldwide web; we have seen different applications of ICTs in enhancing cognitive development. Thomas and Ranga in [23] in their classification divided the application of computers and other communication technologies in education into three broad categories. These are: Pedagogy, Training and Continuing Education. The pedagogical applicability of the ICTs is concerned essentially with the more effective learning and with the support of the various components of ICTs. Almost all subjects ranging from mathematics (the most structured) to music (the least structured) can be learnt with the help of computers.

[15] emphasized that pedagogic application of ICTs, involves effective learning with the aid of computers and other information technologies, serving the purpose of learning aids, which plays complementary roles in teaching/learning situations, rather than supplements to the teacher/instructor/facilitator. Computer is regarded as add-on rather than a replacing device. The pedagogic uses of the computer necessitate the development, among teachers as well as students, of skills and attitude related to effective use of information and communications technologies. Aside of literacy, ICTs also facilitates learning to programme, learning in subject areas and learning at home on one's own, and these necessitate the use of new methods like modelling, simulation, use of data bases, guided discovery, closed-word exploration etc. The implications in terms of changes in the teaching strategy, instructional content, role of the teachers and context of the curricula are obvious as well as inevitable. Pedagogy through the application of information and communications technologies has the advantage of heightening the motivation; helping recall previous learning; providing new instructional stimuli; activating the learner's response; providing systematic and steady feedback; facilitating appropriate practice; sequencing learning appropriately; and providing a viable source of information for enhanced learning. Teachers who use this system of instructional strategy would be able to kindle in the hearts of the learners a desirable attitude towards information technology tools in their entire way of life.

2.3 TEACHERS AND INSTRUCTIONAL APPLICATIONS OF ICTS

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod casting are constantly emerging[12]. To Marshal, various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills; database and spreadsheet programmes promote organizational skills; and modelling software promotes the understanding of Science and Mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education[6]. Technologies available in classrooms today ranges from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. [17] asserts that even the cell phones that many now carry with them can be used to learn. According to [11] each technology is likely to play a different role in students learning. Rather than trying to describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions could then be observed from the literature. Students can learn from computers where technology are used essentially as tutors and serve to increase student's basic skills and knowledge. Moreover, they can learn with computers where technology is used as tool that can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills[18,19]. According to[13], the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI). These software applications are also the most widely available applications of educational technology in schools today, along with word-processing software, and have assisted in classroom for more than 20 years[5]. [13] explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for self -study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also manifests two key assumptions about how computers can assist learning. First, the users' ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning. As DES is recognised as the commonly used approach to computer use in student learning, in more recent years, use of computers in schools has grown more diversified as educators recognize the potential of learning with technology as a means for enhancing students reasoning and problem- solving abilities. [26] notes that "this shift which has been driven by the plethora of new information and communication devices now increasingly available to students in school and at home, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills." It should be noted at this juncture that there appear to be three main approaches to ICT taken by teachers according to[23]. These are: Integrated approach: planning the use of ICT within the subject to enhance particular concepts and skills and improve students' attainment. This involves a careful and considered review of the curriculum area, selecting the appropriate ICT resource which will contribute to the aims and objectives of the curriculum and scheme of work, and then integrating that use in relevant lessons. Enhancement approach: planning the use of an ICT resource which will enhance the existing topic through some aspect of the lessons and tasks. For example, using an electronic whiteboard for presenting theory about a topic. In this approach, the teacher plans to complement the lesson with an innovative presentation method to promote class discussion and the visualisation of problems. Complementary approach: using an ICT resource to empower the pupils' learning, for example by enabling

them to improve their class work by taking notes on the computer, or by sending homework by email to the teacher from home, or by word processing their homework.

2.4 NIGERIAN NATIONAL POLICY AND REGULATIONS ON INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION

In June 10, 1993, Nigeria government established a body known as the Computer Professionals Registration Council of Nigeria to regulate and advance the knowledge of computer science and the use of computational machinery and techniques related thereto. Unfortunately, government has not given the body the full support and backing to enforce and operate effectively especially at the government institutional levels and this has made the regulating body to have no specific direction on ICT or technology plan at institutional levels. Advanced countries have specific plans for ICT. For instance, in Britain the National Grid for learning initiatives, and the strategy for Education Technology, specifically addressed ICT issues in United Kingdom and Northern Ireland respectively[21]. The Nigerian national policy does not give any guidelines on school technology plans. The implications of these inadequacies are that the national policy cannot adequately take care of the need of the Nigerian education system. Its educational focus is limited to the market driven goal

2.5 CHALLENGES TO EFFECTIVE INTEGRATION OF ICT IN EDUCATION

Some of the challenges to effective integration of ICT in the Nigerian education system include:

- In Nigeria a good number of teachers and support staff in the school system are far from being computer literate. As [3] rightly notes a high percentage of teachers and lecturers in science subjects in Nigeria are computer illiterate. From this standpoint, it is obvious such teaching staff will find it extremely difficult to deliver ICT compliant education and training.
- Low tele density constitutes a major challenge to ICT integration. For instance, access to telecommunication tools such as computer, Internet and telephones are still low. [1]notes that Nigeria has the second largest telecommunication sector in Africa (second to South Africa) with a subscriber base of 20 million, but has a tele density of less than 15% while Canada with a much smaller population has tele density of 107%.
- Power supply in Nigeria is epileptic. ICT facilities are power driven. In urban cities where there is power supply it is irregular and therefore interrupts the effective use of ICT facilities.
- Low level funding has resulted in low level provision of ICT facilities in schools. [9]observes that education is grossly underfunded in Nigeria and has affected many areas such as the funding of ICT project, training and retraining of teachers, and development of software packages. The current level of funding education in Nigeria with decreasing budgetary allocation to the education sector is a major constraint to provision of ICT facilities in schools. For instance, the federal budgetary allocation to education in Nigeria for years running are far below the 26% education sector funding benchmark stipulated by the United Nations Educational Scientific and Cultural Organization (UNESCO). The effect of poor funding is more pronounced in tertiary institutions where computers are needed for instruction and global information.
- On a serious note, ICT has not been fully integrated into the curriculum of primary and secondary education in Nigeria. Not until the national policy on education is revised to fully integrate ICT in the curriculum the problem will still linger.

III. METHODOLOGY

3.1 Area of Study

To carry out assessment of the use of technology in the classrooms by secondary school teachers in Obafemi-Owode Local Government Area, Ogun state, Nigeria

3.2 Research Design

This study adopted a quantitative research method. An online structured questionnaire was designed to collect data from about 500 teachers in Obafemi- Owode Local Government. The aim was to assess the level of teachers' ICT-compliance and literacy. Only 25 respondents returned their completed questionnaires. The completed questionnaires was analysed using appropriate descriptive statistics with SPSS software version 20. The results were presented in form of charts and tables.

3.3 Research Instrument

A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by [23] and ICT Teachers Survey by [27] was used to gather data on the study. The instrument consists of two sections. The section one request the respondents' demographic information like age, sex, name of school, the class taught etc. The second section contains the items. These are 10 in number. Respondents were required to respond to items 1-8 by ticking as applicable. While item 9 and 10 are Likert type response format in which the respondents were to choose from strongly agree, agree, neutral, disagree, and strongly

disagree. To ascertain the reliability of the instrument after modification, it was administered on 50 respondents which were not part of the sample using test- retest method. The reliability co-efficient through a Cronbach alpha yielded an $r = 0.82$.

IV. RESULTS AND DISCUSSION

Research Question 1: To what extent do technology aids available for teachers in schools. To answer this question teachers were asked to state how frequently are technology aids made available to teachers in their schools? The result is presented in the table below

Table 1: Extent of Technology availability

	Frequency	Percentage (%)
Occasionally	5	20.8
On an ongoing basis	2	8.3
Often	8	33.3
Never	9	37.5
Total	24	100.0

Table 1 shows that 37.5% of the teachers who took part in the study do not have access to technology aids, 33.3 % have access often, 20.8% occasionally have access to technology aids while 8.3% have access to technology aids on an ongoing basis. The results indicates that technology aids are available to majority of the respondents in their schools

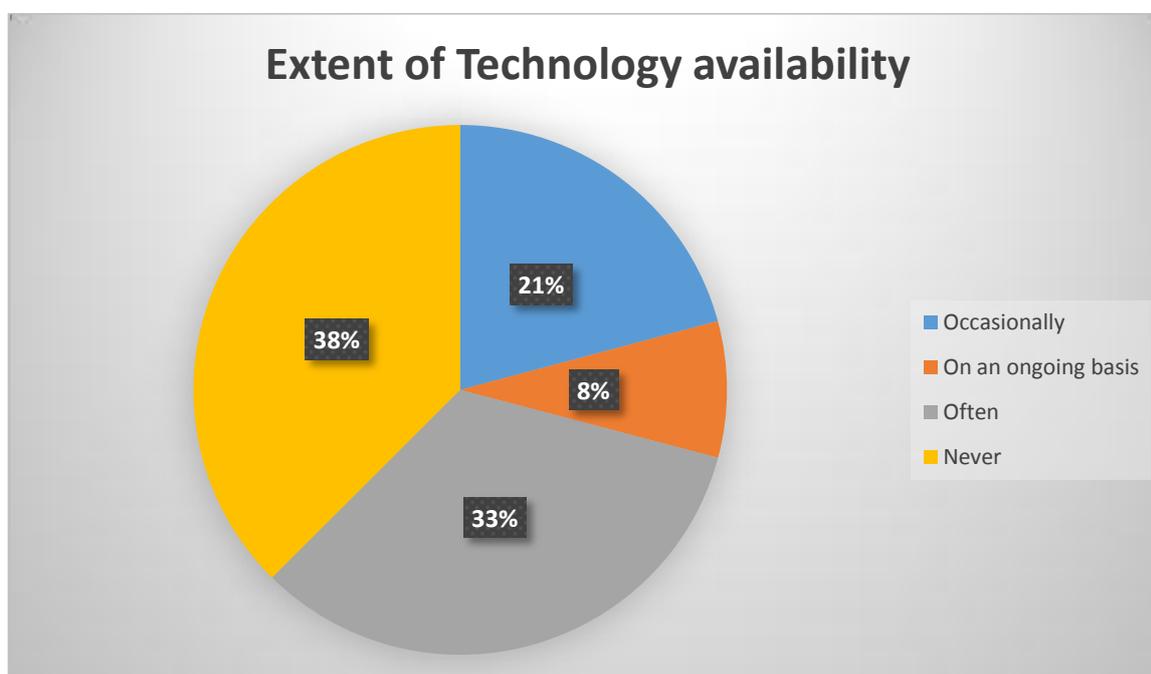


Figure 1: Extent of Technology availability

Research Question 2: What types of technology are used by the teachers?

Table 2: Types of Technology used

	Adequate	Good	Poor	Non-Existent
Computer	29.2% (7)	25% (6)	25% (6)	20.8% (5)
Digital Camera	33.3% (8)	25% (6)	29.1% (7)	12.5% (3)
Printers	16.7% (4)	20.8% (5)	25% (6)	37.5% (9)
Data Projectors	8.3% (2)	25% (6)	33.3% (8)	33.3% (8)
Internet	20.8% (5)	16.7% (4)	45.8% (11)	16.7% (4)
E-mail	50% (12)	29.2% (7)	16.7% (4)	4.2% (1)
Video equipment	12.5% (3)	25% (6)	33.3% (8)	29.2% (7)

As evidenced in the Table 2 above, 19.2% of identified ICTs are non-existent in the schools, 21.2 % are available and adequate, and 20.7% are good and available while 38.9% are available but poor. Therefore the overall decision is —Not available, meaning that most of ICT resources required for teaching and learning are not available in the schools. This information is summarized in Figure 1.

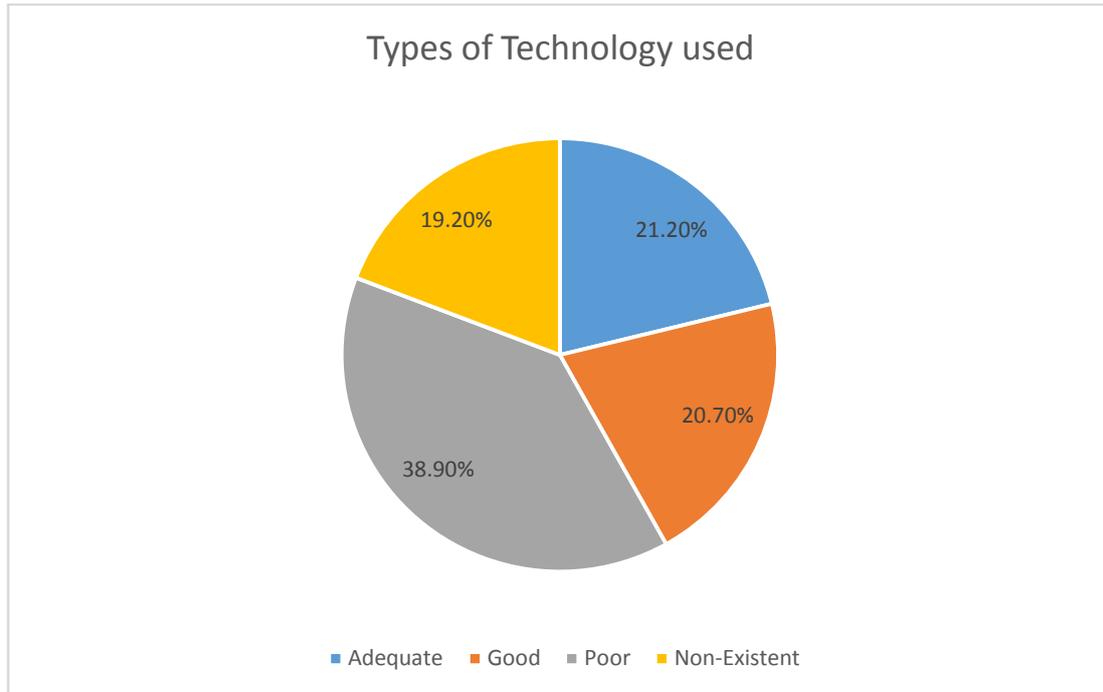


Figure 2: Rating of types of Technology used

Research Question 3: What are the sources of technologies used in the schools?

Table 3: Sources of Technology

Item	Personal ownership	School ownership	Borrowed
Desktop	33.3% (8)	37.5% (9)	29.2% (7)
Laptop/IPad	20.8% (5)	41.7% (10)	37.5% (9)
Printer	12.5% (3)	87.5% (21)	0%
Scanner	8.3% (2)	91.7% (22)	0% (0)
Flash Disk	41.7% (10)	33.3% (8)	25% (6)
Modem	33.3% (8)	29.2% (7)	37.5% (9)
Camera	20.8% (5)	41.7% (10)	37.5% (9)

Table 3 shows that teachers have in their possession varied ICT tools as technology continues to permeate in the teaching and learning activities, 24.3 % of the ICT tools are owned by the teachers, 51.8 % are owned by schools and 23.8% are borrowed. The distribution of personal ownership of basic ICT tools is varied but seems to be influenced by cost whereby most items that are cheap are more prevalent for instance flash disks 41.7%, modems, 33.3% than those which are relatively expensive laptop/Ipad 20.8% printers 12.5%.

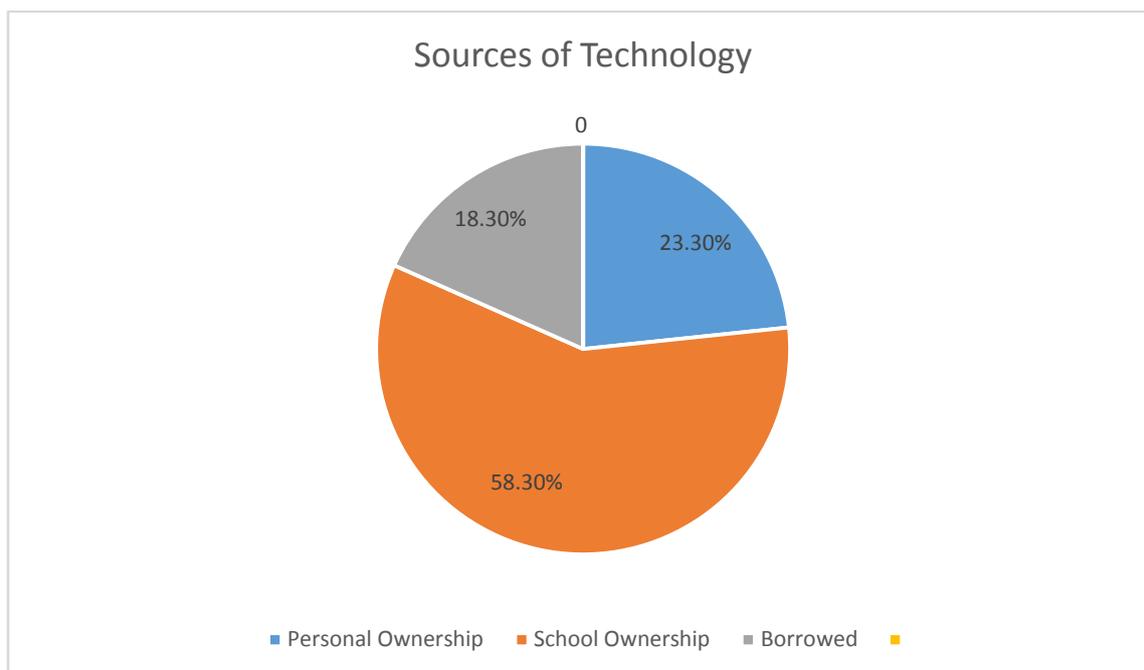


Figure 3: Source of technology used

V. CONCLUSION

From the research findings it is clear that schools in Obafemi-Owode Local Government had installed computers and related peripherals. However they were not adequate for full ICT integration in the teaching and learning process due to the fact that in most schools some ICT equipment were very few for instance desktop and laptops computers and LCD projectors.

The majority of teachers reported to have had some form of ICT training however, they demonstrated low level of confidence in performance of several skills. Generally there is low extent of ICT integration by teachers and the implementation of ICT integration policy was hampered by various challenges that need to be addressed.

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