# EVALUATION OF THE USE OF ICT IN THE TEACHING AND LEARNING PROCESSES ADMIST COVID-19 PANDEMIC IN ADULT LITERACY CENTRES IN OREDO LOCAL GOVERNMENT AREA: PROBLEMS AND PROSPRECTS

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**A RESEARCH WORK SUBMITTED TO THE DEPARTMENT OF ADULT AND NON-FORMAL EDUCATION, FACULTY OF EDUCATION, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF EDUCATION (B.ED) DECREE IN ADULT EDUCATION, UNIVERSITY OF BENIN, BENIN CITY.**

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## CERTIFICATION

This is to certify that this study was solely carried out by OGBEIDE-OKOH EMMANUELLA OMONIGHO with Matriculation Number EDU1602150 in the

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## DEDICATION

This study is dedicated to Adult Learners in various Adult Literacy Centres and the Department of Adult and Non-Formal Education, Faculty of Education, University of Benin.

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## TABLE OF CONTENTS

## LIST OF TABLES

**ABSTRACT**

This study evaluated the use of ICT in the teaching and learning processes amidst pandemic in Adult Literacy Centres in Oredo Local Government Area. The population of the study comprised of facilitators and adult learners in three Adult literacy centres in Oredo Local Government Area of Edo State. The study comprised a sample of 120 respondents (25 facilitators and 95 learners), who were selected using the simple random selection method technique.

Five research questions were raised, and the questionnaire research instrument was used. The questionnaire comprised of 20 items to enable the proper analyses and evaluation of the research question raised. The reliability of the instrument was ascertained using the test-retest method.

Data collection was analysed using simple percentages. The anaylsis reviewed that Adult Literacy Centres made use of minimum ICT equipment and mediums to aid the teaching and learning processes of the Adult Learners. It also revealed that facilitators in Adult Literacy Centres should be trained on the use of ICT gadgets and equipment to enable sustainable use and continuous teaching and learning. There should also be the conscious involvement and integration of ICT in Adult Literacy Centres especially because of the still present COVID19 virus Pandemic.

# CHAPTER ONE

# INTRODUCTION

## Background to the Study

With the sudden appearance of the novel COVID-19 pandemic, the world, including Nigeria, went into a lockdown mode to keep the citizens safe. All activities which involved face-to-face meetings were disrupted not excluding the educational systems; leading to the near-total closures of schools, universities and colleges and also non-formal learning centers. Therefore there was need for alternative means of teaching and learning.

Among such other means of carrying out effective teaching and learning despite the distance between teachers and students is the one associated with the use of information communication technology (ICT). Even before the COVID-19-induced lockdowns the ICT has been deployed especially in several developed and even developing countries as a tool for enhancing human activities generally. According to Adam (2007), ICT has invaded and transformed many aspects of human existence to the extent that people live in an environment that is dominated by technology which itself is consumer-driven. He further stated that no matter how the presence of ICT is perceived, there is no denying that it is an important part of people's lives and that it is here to stay. So, just as the impacts of ICT are felt on every sphere of human existence, it particularly impacts on literacy programs in more ways than one.

An important impact ICT has on Education across the world is its influence on

online learning where it allows for new ways of learning for students and teachers. E-learning or online learning is becoming increasingly popular and with various unprecedented events taking place in people's lives, notably the COVID-19 pandemic, this does not only open opportunities for schools to ensure that students have access to curriculum materials whilst in the classroom but also allows them to ensure students outside the classroom such as at home or even in hospitals can learn (Galyen, 2011). In addition, across the world, ICT brings inclusion. In this aspect, the impact of ICT on Education is of such that students in the classroom can all learn from the curriculum material. Students with special needs are no longer at a disadvantage as they have access to essential material and special ICT tools can be used by students to make use of ICT for their own educational needs. There is also the fact that society's demands for new technology has not left out adult literacy learners. According to Young (2013), these categories of learners are fascinated with technology and this encourages and motivates them to learn in the classroom and at home.

Be that as it may, before the appearance of the pandemic, the need for the use of ICT in Education slowly grew because society is rapidly transforming into one which is based on information, requiring its citizens to be familiar and at ease with information based resources and manipulations. According to Adebola (2008) for a Nigerian learner not to be left out in what is happening in the world, he/she has to key into the use and application of internet and this has to start from the foundation of education.

Adult education is a versatile area of study that needs to be strengthened with

Information and Communication Technology (ICT) equipment. This is so because adult education touches all aspects of human endeavors that demand the use of technological equipment. Fasakun (2006) observed that adult education is not concerned with preparing people for life but rather with helping or assisting people (adults) to live more successfully as useful and acceptable members of their societies and contribute meaningfully to the development of those societies. With this knowledge, adult education should be re-positioned to excessively launch the present adults into the orbit where they can respond to the challenges brought in by information and communication technology in order to make meaningful contributions to national development and increase their literacy skills.

In the simplest sense, literacy means "the ability to read and write" in a given language, but this definition appears very inadequate because it does not give a clear picture of the level of one's "ability to read and write". For Akinpelu (2002), literacy means more than the skills or the ability to read and write alphabets, words and simple statements. This, is what Wagner (1991) calls "native or low literacy". Obanya (2004), views literacy as a developmental concept, which recognises the UNESCO's definition of literacy as the ability to read and write with understanding of a simple statement (in one's own language) related to one's daily life". Explanations of literacy in relation to ICT differ from the prevailing belief that literacy simply involves encoding and decoding verbal and written language. Because literacy is not a skill that is endlessly portable between domains and tasks, individuals have variable literacy capability: they have more

in some literacy activities and less in others (Collins 1995). As a result, the old assumption that literacy is a singular skill, permanently available to those who gain it, is no longer tenable. The nature of literacy is the historically unprecedented impact of instantaneous electronic communications. Information and communication technologies are deeply dependent on literacy and each technology makes a unique demand on the literacy skills of users. Furthermore, over time the separate technologies which mediate the digital revolution converge with each other, and this process also has a major impact on what counts as literacy: mobile telephones, with voice and text transmission, increasingly carry images; and computers increasingly transmit combinations of images, moving and still, and allow users to operate a multitude of coding and accessing modes.

In today's knowledge economy, learning is needed to survive and to thrive, therefore knowledge is power and the proliferation of knowledge through e-learning is not a luxury but a necessity for current and future generations. The introduction of e-learning through information and communication technology (ICT) as an innovative method of disseminating knowledge seems to be an indispensable technological device that is capable of enhancing knowledge and also serving as powerful tool for the acquisition of skills.

ICT refers to technologies that are applied in the process of collecting, storing, editing, retrieving and transfer of information in various forms (Olakulehin, 2007). The Federal Ministry of Education, Nigeria (2010) defines ICT as encompassing all equipment and tools (inclusive of traditional technologies of radio, video and television

to the newer technologies of computers, hardware, etc,), as well as the methods, practices, processes, procedures, and principles, that are used in the conduct of the information and communication activities. In addition, ICT tools are able to aid facilitators to do or complete job related tasks. For example, software programmes help store students marks and prepare report cards, lessons delivery is made easier with presentation. The computer is dramatically changing education, CDs and other electronic media, many of those limitations are diminishing as students/learners to take course online from established educational institutions using e-mail, video conferencing and inter-relay chart as a method of interacting with teachers and follow learners. Information and communication technology is seen as a motivator, as opening up wider access to learning and providing new ways of teaching and learning in adult education delivery in Nigeria.

But it is important to note that ICTs on their own are not a solution to addressing the needs of disadvantaged learners. If anything, the most disadvantaged learners are the least likely to benefit from unmediated ICT access, since for them the social context of learning and personal support are especially important in creating motivation and engagement. Nor will acquiring ICT skills in itself overcome exclusion. Rather, ICT needs to be seen as part of an overall strategy to address failure (of education systems and of individuals), one that will embrace face-to-face as well as distance/online learning, and embed ICT use in the life of the individual and the community.

For the purpose of this study, ICT has to do with the use of Virtual and Electronic

Learning. Stockley (2003) opined that e-learning is the delivery of a learning, training or education programme by electronic means. It involves the use of a computer or electronic device like the mobile telephone etc. It is a fast growing way of learning with the help of computers and internet connection. It also refers to all forms of electronically supported instruction. Tinio (2002) defines E-learning, to encompass learning at all levels, both formal and informal, with the use of an information network – the Internet, an intranet (LAN) or extranet (WAN) whether wholly or in part, for course delivery, interaction and/or facilitation. E-Learning provision may be either: a) Web-supported b) Web-dependent c) Fully online

The information and communication technology (ICT) has become a key tool that has revolutionized how we see the world and how we live in it. This phenomenon has given birth to advances in our ways of life and also having a revolutionary impact on educational methodology in adult education (Adewale, 2003). These new ways constitute a shift from a teacher-centered to learner-centered pedagogy (Tinio, 2003).

**Statement of the Problem**

Being transformative in nature requires competency in literacy. Literacy is crucial for acquiring a range of learning skills and serves as a stimulus for further learning which will help adults to expand their knowledge base and shape their destinies. However, for Literacy to be fully acquired, there should be continuous uninterrupted literacy classes for adult members in a given society.

Unfortunately, among the myriad of challenges confronting uninterrupted and

effective adult literacy in Nigeria, the sudden emergence of the COVID-19 pandemic has further compounded the frequently disrupted Nigerian education system as educational institutions across the country were locked down in order to curb the spread of the pandemic (Mbah, 2020). Therefore, given the possibility that the global pandemic might stay among humanity for a long time (UNESCO, 2020), virtual teaching and learning through the information communication technology is now being adopted across the world as a means of continuous education in the context of lockdowns. This study therefore attempts a careful examination of such challenges as well as the prospects and opportunities associated with the ICT-based educational system as far as adult literacy is concerned within the context of adult literacy centres in post-COVID-19 Oredo LGA.

**Research Questions**

This research questions guiding this study include:

1. What is the level of availability of ICT infrastructure in the Adult Literacy Centres?
2. How useful are the available ICT facilities in the Adult Literacy Centres?
3. To what extent can the potential opportunities provided by the ICT facilities in Adult Literacy Centres be enhanced for sustainable use?
4. How has ICT infrastructure been used in improving the teaching-learning during the Covid-19 Pandemic in Adult Literacy Centres?
5. What are the challenges hindering the effective use of ICT facilities in Adult Literacy Centres?

## Purpose of the Study

The primary purpose of this study seeks to find out the following:

- Find out the degree of availability of ICT infrastructure in the Adult Literacy Centres.
- Determine the level of usefulness of the available ICT facilities in the Adult Literacy Centres.
- Find out the extent to which the potential opportunities provided by the ICT facilities in Adult Literacy Centres can be enhanced for sustainable use.
- Find out the extent to which ICT infrastructure is being used to improve the teaching-learning during the Covid-19 Pandemic in Adult Literacy Centres.
- Find out the challenges hindering the effective use of ICT in Adult Literacy Programmes.

## Significance of the Study

It is expected that the outcome of this study will be of tremendous benefits to a wide range of stakeholders in the education industry, including particularly the learners, the facilitators and the government. With the appearance of the Pandemic, the world took to the use of ICT and Virtual Learning, and everyday the expansion of on the use of ICT increases.

The findings of this study will help learners understand why the use of ICT in Virtual Teaching and Learning is important in so many ways, including time savings and

cost effectiveness, as well as the ability to facilitate learning for over a long time. Learners will also realize that ICT and Virtual Learning is a convenient way to pursue an academic qualification, especially because it exposes learners to a flexible, self-paced method of learning.

For Facilitators, they will realize that ICT is an important tool that can be utilized for a convenient and flexible Teaching-Learning process. They will also have knowledge of the best ICT tools to integrate alongside the theory of andragogy.

To Literacy Centres Administrators, this study will enable them recognize that ICT can serve several critical functions, including enabling the satisfaction of the adult learners needs, and the satisfaction of stated goals and objective of the Centres.

Finally, the findings from this study will enable the Government realize that ICT based Teaching and Learning can bring about changes in the lives of the learners, which will necessitate proper planning and policy formulation. Furthermore, they will recognize that National ICT policies are to serve important functions such as providing a rationale, a set of goals, and a vision of how education systems will operate if ICT is integrated into the Teaching and Learning process. They will also realize that effective National ICT policies benefit facilitators, administrators and adult learners themselves.

**Scope and Delimitation of the Study**

This study is focused on accessing the methodology and use of ICT in teaching

and Learning process of Adult Literacy. The research is limited to Learners and Facilitators of Adult Literacy Programmes selected from three Literacy Centres in Oredo Local Government Area of Edo state.

**Definition of Terms**

**ICT:** Information and Communications Technology refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middle-ware, video-conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form.

**Virtual Learning:** This is a learning experience that is enhanced through utilizing computers and/or the internet both outside and inside the facilities of the educational organization.

**E-learning:** This is leaning utilizing electronic technologies to access educational curriculum outside of a traditional classroom.

**Pandemic:** This is an epidemic of an infectious disease that spread across a large region, for instance multiple continents or worldwide, affecting a substantial number of people.

**Learner:** This is a person who is older and is involved in forms of learning.

**Literacy:** This is the ability to identify, understand, interpret, create, communicate and compute using printed and written materials associated with varying contexts.

**Evaluation:** This is the judgement about how good, useful, or successful something is.

# CHAPTER TWO

# REVIEW OF RELATED LITERTAURE

In this chapter, we will review the literature based on the following sub-topics:

- Concept of Adult literacy
- Information communication technology (ICT)
- Virtual teaching and learning
- Comparative Analysis of Virtual and Face-to-Face Learning Methods
- Importance of ICT-Based Virtual Learning System
- Education-Related ICT Infrastructure in Nigerian Educational System
- Summary of Literature Reviewed

**Concept of Adult Literacy**

In the first place, literacy means "the ability to read and write" in a given language, but this definition appears very inadequate because it does not give a clear picture of the level of one's "ability to read and write". This myopic conception has led many countries to construe and apply literacy to education in different ways and contexts. For example, Sosu (2006) observes that that there are context-specific definitions of literacy in various countries, notably in Albania, Djibouti, Niger, Sierra Leon and Senegal. For instance, in Senegal literacy is defined as "the capacity to read and write". In Djibouti, it implies the "percentage of the population aged 10 and above who can read and understand a short and simple statement". In Sierra Leone, literacy is associated with "those who can read and write and have basic numeracy skills or those who have reached the fifth year of primary education, or higher…" In Albania, literacy simply implies the

acquisition of “minimal language competence”. However, Sosu finally describes the above definitions as not only inadequate but also vague.

Therefore, for Akinpelu (2002), literacy means more than the skills or the ability to read and write alphabets, words and simple statements, arguing that restricting the concept to merely being able to read and write can only be done in contexts of what he describes as “native or low literacy”. It is probably for the above reason that Obanya (2004) views literacy as a developmental concept which recognises the UNESCO’s definition of literacy as the ability to read and write with understanding of a simple statement (in one’s own language) related to one’s daily life”. Later, this definition was complemented by the “ability to count and do simple calculations (or basic arithmetic).

With time, the scope of literacy became broader to include several approaches and insights that guide people in understanding and applying the term. For instance, in recent times, we talk about computer literacy, technological literacy, environmental literacy, political literacy, economic literacy and so on (Akinpelu, 2002). It is in recognition of this fact, that the Programme for the International Assessment of Adult Competencies (2006) postulates that: “Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts”. Literacy involves a continuum of learning which enables individuals to actualize their goals, to develop their knowledge and potential, and to take full and active part in their community and the larger society. This ultimately leads to *functional literacy*; a term that has to do with the ability to adapt to new and changing circumstances and

requirements. By implication, a functionally literate person must have gone beyond being "moderately literate" to being "highly literate" (Wagner, 2011).

In effect, it is the functional aspect of literacy that has motivated governments and individuals to seek ways of improving literacy rates. Some reasons for this are given by Suso (2006) as follows:

- ***The Right Approach*:** It is evident that there is a right to literacy as there is a right to education; and that a reduction in illiteracy will lead to a reduction in poverty.
- ***The Social Approach*:** This approach envisages literacy as a desired outcome that focuses on social or cultural dimensions which has a link with human development, empowerment and personal well-being.
- ***The Functional Approach*:** This approach is premised on skills and competencies one needs to function effectively in society, which encourages self-employment. The aim of this approach is to sustain economic growth and to increase productivity.

In essence, all forms of literacy and the approaches to them are geared towards making the recipients functional and self-reliant individuals, who will equally contribute meaningfully to societal development. In this regard, Jalal and Sardjunani (2006) affirm that:

> *Literacy plays an essential role in improving the lives of individuals by enabling economic security and good*

> *health and enriches societies by building human capital, fostering cultural identity and tolerance, and promoting civic participation* (p.132).

Having understood what literacy is all about it should be pointed out that the concept of adult literacy is derived from the general concept of literacy. In other words, it is an aspect or a type of literacy that has to do with the adults. An adult in this case is someone, in the Nigerian context, who is eighteen years and above, and who is mentally, physically, socially and psychologically mature. Adult literacy therefore has to do with the ability of an individual adult (man or woman) to read, write and communicate in known language(s), as well as the ability to do basic mathematical computations far beyond basic literacy level. In simple terms, adult literacy should be seen as a tool that can equip the individual to improve himself intellectually, to empower himself economically, and to make himself socially and politically relevant (Ezimah, 2012).

With this tool, the mutually reinforcing trinity of poverty, illiteracy and gender inequality can be drastically reduced to the barest minimum. It is in recognition of this that Hinzen (2006) observes that:

> *Adult literacy is the fertilizer needed for development and democracy to take root and grow. It is the invisible ingredient in any successful strategy for eradicating poverty and achieving gender equality.* (p.49)

In order to realize this, adult literacy should be seen as a continuous process that

requires regular and sustained learning. This, unarguably forms the basis of functional adult literacy that would ensure life-long learning process, which is opposed to adult literacy that enslaves" (Obanya, 2004).

Meanwhile, Nzeneri (2010) has suggested the following as what the components of adult literacy program should be if its functionality is to be ensured:

- Reading; i.e., ability to read up to a particular grade level;
- Writing; i.e., the ability to write clearly and reasonably in a particular language;
- Mathematics: "Numeracy" or the ability to perform basic mathematical operations needed in daily life.
- English as a second or other language (ESOL): The teaching of English speaking, listening, reading and writing skills to those for whom it not a native language.
- Cultural literacy: Familiarity with the background knowledge of the cultural heritage of one's society.

At the same time, adult literacy program can be categorized into two: basic adult literacy and functional adult literacy programs (Ezimah, 2004). The Basic Adult Literacy Program is mainly designed to arm or furnish the students with the rudimentary skills of reading, writing and computation through the use of the local languages, especially in the mother tongue. The objective here is to equip the learners with basic skills of communication and understanding of their environment. On the other hand, functional adult literacy programs combine both the teaching of literacy, numeracy and vocational skills. The objective is to equip recipients with skills and knowledge that could make

them employable and useful in other spheres of life on completion of training. For this reason, adult literacy learning programs should take place in the context of development or livelihood activities. In this respect, Hinzen (2006) postulates that:

> *... literacy can best be learned by adults through a highly contextual, even individual-specific program in which the literacy learners are engaged in doing their own daily life literacy activities – "learning by doing" rather than "learning in preparation for doing", or... "breaking out of the education silo into ..." a "literacy second" model, a program starting with a developmental activity and including informal literacy learning within it. (p.55).*

This type of adult literacy makes the participants useful to themselves as well as to the larger society. In effect, adult literacy program should not take a single model, rather it should be diversified. It could be argued that a "one-size-fits-all program" can be a recipe for failure.

**Information Communication Technology (ICT)**

Information and Communication Technologies (ICTs) is a broader term for Information Technology (IT), which refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form.

ICTs are also used to refer to the convergence of media technology such as audio-visual and telephone networks with computer networks, by means of a unified system of cabling (including signal distribution and management) or link system (Kondra, 2020).

However, Mathur (2017) argues that there is no universally accepted definition of ICTs considering that the concepts, methods and tools involved in ICTs are steadily evolving on an almost daily basis. Mathur (2017) adds that being a broad subject with evolving concepts, ICT covers any product that will store, retrieve, manipulate, transmit, or receive information electronically in a digital form (e.g., personal computers, digital television, email, or robots). Meanwhile, the origin of the term, "information and communication technologies", can be traced to the 1980s when it was first used by academic researchers. The abbreviation "ICT" became popular after it was used in a report to the UK government by Dennis Stevenson in 1997, and then in the revised National Curriculum for England, Wales and Northern Ireland in 2000 (Roger, 2012).

Be that as it may, within the context of education, Wartella (2014) states that there is some evidence that, to be effective in education, ICT must be fully integrated into teaching and learning. Specifically, Wartella (2014) further argues that when teaching literacy and math, using ICT in combination with writing produces better results than traditional methods alone or ICT alone. In fact, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has made integrating ICT into education part of its efforts to ensure equity and access to education. The following statement, taken directly from a UNESCO publication on educational ICT, explains the organization's position on

the initiative (Ibid).

Besides, Information and Communication Technology can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance, and administration. UNESCO takes a holistic and comprehensive approach to promote ICT in education. Access, inclusion, and quality are among the main challenges they can address. The Organization's Inter-sectoral Platform for ICT in education focuses on these issues through the joint workof three of its sectors: Communication & Information, Education and Science (Kemp, 2016).

Despite the power of computers to enhance and reform teaching and learning practices, improper implementation is a widespread issue beyond the reach of increased funding and technological advances with little evidence that teachers and tutors are properly integrating ICT into everyday learning. In Africa, particular, ICT has been employed as an educational enhancement since the 1960s. Beginning with television and radio, it extended the reach of education from the classroom to the living room, and to geographical areas that had been beyond the reach of the traditional classroom. As technology evolved and became more widely used, efforts in Sub-Saharan Africa were also expanded. In the 1990s a massive effort to push computer hardware and software into schools was undertaken, with the goal of familiarizing both students and teachers with computers in the classroom. Since then, multiple projects have endeavored to continue the expansion of ICT's reach in the region, including the One Laptop Per Child

(OLPC) project, which by 2015 had distributed over 2.4 million laptops to nearly 2 million students and teachers (AFD, 2015).

The inclusion of ICT in the classroom, often referred to as M-Learning, has expanded the reach of educators and improved their ability to track student progress in Sub-Saharan Africa. In particular, the mobile phone has been most important in this effort. Mobile phone use is widespread, and mobile networks cover a wider area than internet networks in the region. The devices are familiar to student, teacher, and parent, and allow increased communication and access to educational materials. In addition to benefits for students, M-learning also offers the opportunity for better teacher training, which leads to a more consistent curriculum across the educational service area. In 2011, UNESCO started a yearly symposium called Mobile Learning Week with the purpose of gathering stakeholders to discuss the M-learning initiative (Ibid).

Implementation is not without its challenges. While mobile phone and internet use are increasing much more rapidly in Sub-Saharan Africa than in other developing countries, the progress is still slow compared to the rest of the developed world, with smart phone penetration only expected to reach 20% by 2017. Additionally, there are gender, social, and geo-political barriers to educational access, and the severity of these barriers vary greatly by country. Overall, 29.6 million children in Sub-Saharan Africa were not in school in the year 2012, owing not just to the geographical divide, but also to political instability, the importance of social origins, social structure, and gender inequality. Once in school, students also face barriers to quality education, such as teacher competency,

training and preparedness, access to educational materials, and lack of information management (Ibid).

In modern society ICT is ever-present, with over three billion people having access to the Internet. With approximately 8 out of 10 Internet users owning a smart phone, information and data are increasing by leaps and bounds. This rapid growth, especially in developing countries, has led ICT to become a keystone of everyday life, in which life without some facet of technology renders most of clerical, work and routine tasks dysfunctional. The most recent authoritative data, released in 2014, shows "that Internet use continues to grow steadily, at 6.6% globally in 2014 (3.3% in developed countries, 8.7% in the developing world However, hurdles are still large. "Of the 4.3 billion people not yet using the Internet, 90% live in developing countries. In the world's 42 Least Connected Countries (LCCs), which are home to 2.5 billion people, access to ICTs remains largely out of reach, particularly for these countries' large rural populations." ICT has yet to penetrate the remote areas of some countries, with many developing countries dearth of any type of Internet (Kondra, 2020; Mathur, 2017).

This also includes the availability of telephone lines, particularly the availability of cellular coverage, and other forms of electronic transmission of data. The latest "Measuring the Information Society Report" cautiously stated that the increase in the aforementioned cellular data coverage is ostensible, as "many users have multiple subscriptions, with global growth figures sometimes translating into little real improvement in the level of connectivity of those at the very bottom of the pyramid; an

estimated 450 million people worldwide live in places which are still out of reach of mobile cellular service." (Kemp, 2016) Besides, with desktops soon becoming part of a bygone era, and laptops becoming the preferred method of computing, ICT continues to insinuate and alter itself in the ever-changing globe. Information communication technologies play a role in facilitating accelerated pluralism in new social movements today. According to Kondra (2020), more than being used merely for education and interpersonal communication, ICTs can be used to garner grassroots support for a cause especially through the mobilization of the masses to put pressure on authorities.

**Virtual Teaching and Learning**

Virtual Teaching and Learning refer to education that takes place over the Internet. A significant number of colleges across the world are moving from the traditional face-to-face classes into fully virtual, online, web-based courses. Virtual education, often called distance education or web-based education, is currently the latest, most popular form of distance education. It has recently become an integral part of many university programs (Bates, 2005). As a matter of fact the process of learning is complex and it involves the auditory, visual, and tactile senses. The traditional way of learning at a school or any learning center is not for everyone. Virtual learning is therefore for those who wish to study and still engage in work or other commitments.

Furthermore, for Christina (2011), virtual learning can be described as a form of distance education and as web-based learning, e-learning, and digital learning. It is

offered over the Internet and uses web-based materials and activities. Students need to be technologically savvy to use technology tools that may be required. Students of the digital age appear to be independent, more technology disciplined, and technology savvy, well suited for online environment. Christina (2011) adds that virtual learning at the pace of each student is very beneficial for a high-quality certificate, no matter the level of education. The point here is that whether offered on campus or delivered online, each course offering is usually structured to meet the same rigorous criteria and the strict academic standards. The only difference is in the way the course is delivered. Generally, students are required to have access to a computer system with high-speed Internet connections. They may also expect electronic academic support services such as registration, financial aid, libraries, tutoring, and advisement (Ibid).

With regard to the benefits of virtually delivered education, it provides great opportunities and great challenges. It has benefits for the students and instructors. It offers the convenience of time and space, cost-effectiveness, and flexibility. Virtual learning allows students to pursue internationally recognized academic qualifications without the need to attend classes on campus. Coble (2016) further explains that virtual education is preferred by students who cannot participate in traditional classroom settings. It is convenient since it allows one to study anywhere that has an Internet access. Besides, virtually delivered courses are available 24/7.Over the past decade, the number of such courses have also grown rapidly. At the same time, although online education may work for everyone, some less-developed countries see the online education as cost effective. It

is needless to say that virtual teaching and learning (in either synchronous or asynchronous manner) is applied in all disciplines such as engineering, computer science, medicine, nursing, business, music, and social sciences. In addition, virtual teaching and learning is becoming common even in business organizations (Christina, 2016).

Be that as it may, Taylor (2015) points out certain issues facing a virtual educational instructor to include being effective in delivering the course, responding to student emails, getting used to the online tools and infrastructure. Critics of online teaching and learning question its value, effectiveness, and quality. Additionally, Taylor (2015) stresses that since online teaching and learning systems have not been able to convey interactions between the instructor and students; its educational effectiveness is lower than the traditional face-to-face lecture. Responding to student email messages in a timely manner can be challenging since it requires significant amount of instructor's time. It takes a lot of time to prepare and teach an online course. The challenge of virtual education largely depends on virtual instructors. There is also the issue of intellectual property and ownership of materials placed on the web.

**Comparative Analysis of Virtual and Face-to-Face Learning Methods**

The importance of online learning as the last decade's new pedagogical mode in higher education is evident in the number of studies that examine its value to learners, particularly through the widespread use of computer conferencing (Stephenson, 2001). Studies comparing virtual learning with face-to-face learning have strengthened the case

for the newer mode of learning while evidence has been gathered to show its effectiveness. Van Schaik, Barker & Beckstrand (2013), in reporting a transition from traditional on-campus education to online learning, described a study that compared online learning (using the WebCT learning management system, with additional electronic lectures) and on-campus classes. Their findings, showing no significant difference between the two modes in either test results or attrition rates, have also been reported by other similar studies. Chen and Zimitat (2004), used measurement of student outcomes through test scores and these also proved there was no significant difference in learning outcome between the two modalities. Such results have strengthened support for virtual learning in higher education, when universities can claim that students are considered to be learning as effectively virtual as they are on campus.

Indeed, when Ladyshewsky (2014) compared student learning in nine courses in a graduate business degree, all being taught in both virtual and face-to-face modes, he found that overall the students learning virtual did better than those learning in a face-to-face mode. The virtual courses used Lotus Learning Space to provide lecture notes, resources, self-assessment activities and teacher-moderated discussions; over time, both the quality of the online design and the instructors' experience teaching online improved. At the individual course level, the differences in learning between both modes did not prove statistically significant, however the study “provides some assurance that student performance is at least as good as, if not slightly better in EL [electronic learning] mode when compared to F2F [face-to-face] delivery”. (p. 333).

The potential within the virtual or online environment for collaborative learning and mutual support among students was identified early when online learning first emerged in the late 1980s and gained momentum in the 1990s. Harasim, Hiltz, Teles and Turoff (1995) described the greatest strength of online education as its ability to facilitate interaction, and viewed the strength of computer-mediated communication in its potential for group activity. The social, affective and cognitive benefits of peer interaction and collaboration, which had previously only been possible in face-to-face situations, could be, with the mediation of computer communication, developed with distance education students. The fact that help and feedback could be easily available to students remote from the campus, through the use of both online or virtual group conferencing and e-mail, meant the instructor's role could be less dominant. The students' capacity to raise questions and receive replies and suggestions from other students, as well as from instructors, began to change the nature of traditional teaching.

Analysis of virtual teaching structures such as Campos, Laferriere & Harasim (2011), reported on the move to collaborative activities through online integration, especially with instructors more experienced in online teaching and learning. They also considered the new roles required of instructors and students in establishing such a collaborative environment. Other studies of online use also reported advantageous collaborative attributes. Stacey (2009), in an earlier ethnographic study of three collaborative groups of distance-education students, studying for their Master of Business Administration degree, reported that learning was enhanced through online collaborative

behaviours. These behaviours ranged from sharing the diverse perspectives of the other group members, to being able to seek feedback and to clarify ideas through the group's communication, either electronically or through other forms of communication, stimulated by the electronic group communication. The students sought group solutions for problems through online discussion that combined with collaborative sharing of resources, gave them an environment for actively constructing new ideas and concepts, and enabled them to learn effectively. Baskin (2012) reported that the online environment improved the process of collaborative small-group learning, since it was adapted from face-to-face classroom practice. In his study, undergraduate management students learned collaboratively through assessment tasks of problem-solving activities. Students responded positively to the experience of meeting online; they shared and interpreted data, and also shared resources and fieldwork results.

However, Baskin and several other researchers have warned of the importance of good pedagogical design for achieving this effectiveness. But they have lamented that instructors have yet to learn these design skills. The push to have instructors use an online collaborative mode has also meant that processes for professional development of academic instructors must be established as institutions of higher education seek to ensure instructors are equipped to meet this new market demand. Stacey (2014) reviewed a range of studies reporting on ways instructors were being supported to teach online. Competencies required of online instructors such as those Goodyear, Salmon, Spector, Steeples & Tickner, (2011) described, included the roles of content facilitator,

technologist, designer, manager/ administrator (concerned with issues of learner registration, security, record keeping, etc.), assessor, and particularly that of process facilitator, concerned with facilitating the range of online activities supportive of student learning. These competencies have been taught thro u g h accredited courses such as graduate courses of higher education, short face-to-face workshops, and online courses. Stacey concluded that a staged approach matching the readiness levels of staff and focusing on local and discipline-based ideas and practices were most effective in providing authentic and relevant professional development.

Often, online learning is used in a blended mode where students, having met face-to-face or through synchronous communication (voice or visual media), interact online. Though there is some confusion in defining the term (Oliver & Trigwell, 2005), 'blended learning' most commonly refers to a combination of face-to-face learning with internet-based virtual learning. Osguthorpe & Graham (2003) introduced a special journal issue defining the term and its direction in practice. They state “the aim of those blended learning approaches is to find a harmonious balance between online access to knowledge and face-to- face human interaction” (p. 228). This blend may involve the mixing of online and face-to-face learning activities, students or instructors with a number of goals including pedagogical richness, access to knowledge, social interaction and ease of course revision (p. 231).

Such blending of learning modes makes strict comparisons of modality somewhat complex. Some studies alleging to compare distance and traditional modes of teaching

and learning, in fact describe the distance education modality as a blended mode. Perez-Prado and Thirunarayanan (2012), for example, have conducted a qualitative study of students' perceptions of the same course in both virtual and face-to-face modes, with the 'distance education' mode group also meeting face-to-face at the beginning and end of the semester. This blending of face-to-face with virtual resources is becoming more common in educational sectors and is a trend in higher education that is understandable as instructors, comfortable in face-to-face teaching, begin teaching online. Owston, Garrison & Cook (2006) described such a blend in a study of eight universities from across Canada that have adopted forms of blended learning practices. Most teachers in the study used an online discussion to replace some of their face-to-face teaching; a small proportion of the sample used recorded e-lectures. The students overall were positive about their learning experience and appreciated the web resources. However, many in the sample, both instructors and students, recognized the extra time involved in technology use, as well as the lack of institutional recognition.

Instructors who have been comfortable and competent in traditional face-to-face teaching are often thrust into the new modes of online or blended teaching with only some technical preparation. They also assume their current pedagogical understanding will transfer to the new mode. Though there are some studies that compare experiences of instructors in the two modalities, few studies have explored their perspectives by asking how they approached the different modes and if they taught differently. McShane (2005) explored instructors' beliefs and self-concepts as they changed from traditional to

technologically-mediated teaching. Her findings were similar to the work of Pratt and Associates (2002). They conceptualized a teaching perspective or inter-related set of beliefs and intentions that informs an instructor's classroom practice. Their data was gathered from over 250 instructors in face-to-face teaching contexts and they developed an instrument called the 'Teaching Perspectives Inventory' (TPI), described below within the methodological section of this paper. Though the TPI was developed within a North American conceptual framework of the teaching/learning process, it was validated cross-culturally in China, Hong Kong, Singapore, Canada and the United States and is available online for research purposes only. Our study explored whether this model would also provide a framework for describing instructors' approaches as they teach online.

**Importance of ICT-Based Virtual Learning System**

Education is the basic need of every human being and today's technology has a big part in every sphere of life. In fact, education is the most important investment by countries, societies, families and individuals for the future. A communication network has become an essential tool in today's educational environment than ever before. Today's society is said to have entered into the age of a new social revolution, i.e. 'information revolution'. 21st century has witnessed the explosion of information technologies. By digital revolution, technologies in computers, audio-visual devices, and communications are integrated into a powerful technology-information technology. The global era is characterized by rapid advances in technology and expansion of knowledge. Basically

technology is nothing but a tool used in implementing our ideas and methodology in education (Sadiku, 2018).

Therefore, the advent of the ICT is a catalyst for moving virtual or online education to the next level. The Internet is now playing a bigger role in our lives and dictating how we live, socialize, teach, and learn. As the Internet is developing into a main educational tool, online education offers the educator and the learner access to numerous resources. During the last decade virtual education of various kinds, often called distance education or web-based education, has become a normal part of many academic programs. Online or virtual teaching and learning is designed to reach and engage the modern learner on one-to-one basis anywhere, anytime. A popular one involves Massive Open Online Courses (MOOC), which have grown involving many researchers and research institutions (Wasilik, 2009). The reasons for offering virtual courses include easy and convenient access for students, higher degree completion rates, and the appeal of such courses to nontraditional students. In a similar vein, barriers to the adoption of online courses include lack of faculty commitment and high costs of implementation and delivery of the courses. The key to a successful implementation of virtual teaching and learning is taking student characteristics into account. Strategies that work for conventional fulltime students may not be effective for adult learners with full-time jobs and family responsibilities. These students are mostly practically-oriented with keen interest in tools and technologies (Chu, 2013).

At the same time, the process of learning is complex and it involves the auditory,

visual, and tactile senses. The traditional way of learning at a physical compound of an academic institution is not for everyone. Virtual learning is usually for those who wish to study for a degree or diploma alongside work or other commitments. Virtual learning has therefore been referred to as a form of distance education and as web-based learning, e-learning, and digital learning. It is offered over the Internet and uses web-based materials and activities. Students need to be technologically savvy to use technology tools that may be required. Students of the digital age appear to be independent, more technology disciplined, and technology savvy, well suited for online environment. Virtual learning at one's own pace is beneficial for a high-quality college degree. Whether offered on campus or delivered online, each course offering must meet the same rigorous criteria and the strict academic standards. The only difference is in the way the course is delivered. Generally, students are required to have access to a computer system with high-speed Internet connections. They may also expect electronic academic support services such as registration, financial aid, libraries, tutoring, and advisement (Sadiku, 2018).

Indeed, the application of new technologies in the distance education context provides an appropriate starting point for delineating the knowledge base required of expert teachers in today’s global society. However, the effective integration of ICT into the educational system is a complex, multifaceted process that involves not just technology but also curriculum and pedagogy, institutional readiness, teacher competencies and long term financing, among others. As a matter of fact, every country

is in search for ways of using modern technology for educational purposes and development (Soh 2001). Open and distance education providers in both developed and developing countries, have been quick to realize the potential applications of the new information and communication technology.

It is well documented in the published literature and on Internet sites that on a worldwide basis the ICT plays an increasingly important role in education and training. Furthermore, it has been demonstrated that the use of ICT can improve the quality of the student learning experiences and make education and training opportunities available to a broader spectrum of the population in developing countries. At present educators are excited by the success of information technologies and want to implant them into instruction. They extol information technologies as the solution to break the barriers of time and space and fulfil the dream of life-long education (Christina, 2011).

ICTs are a potentially powerful tool for extending educational opportunities, formal and non- formal. ICTs also facilitate access to experts, resource persons, researcher, professionals, mentors, business leader, and peers- all over the world. For developing countries ICTs have the potential for increasing access to and improving the relevance and quality of education. ICTs stand for information and communication technologies are defined, for the purpose of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information." These technologies include computers, the internet, broadcasting technologies (radio, television) and telephony (Victoria, 2017). This may include all types

of learning technologies such as print, audio, video and the computer. The use of computers in open and distance education has provided new pedagogical strategies in distance learning as well as giving more autonomy to the distance learners (Pelton, 2011).

Technology has become a part of our life on campus, at home, and in the office. The modern technologies used in open and distance learning are telephone tutoring, teleconferencing, audio graphics, video conferencing, computer conferencing drill and practice, fiber optics, teletext, and videotext, multimedia and hypermedia CAI, e-books, the "Internet", the World Wide Web (WWW), or the "Information Super Highway" on-line database, on line discussion, call-in course- on demand, satellite, talk-back TV etc. All of these technologies should have a place in the knowledge base of expert teachers. A potentially useful framework for organizing such a knowledge base is provided by the emergence of different generations of distance education (Taylor, 2015)

Besides, in the concept of new technology, distance learning provides multimedia-based education content to the student utilizing standard data networking, protocols and infrastructure. The main advantages of using technologies in distance education are cost effectiveness, independence of time and place, quality of education access resulting from the mass production of course materials, teaching a lot of students simultaneously, and finding a lot of educational resources (Ibid).

Haddad and Draxler (2002) identify at least five levels of technology use in education: presentation, demonstration, drill and practice, interaction, and collaboration. Each of the different ICTs (print, audio/video cassettes, radio and TV broadcasts,

computers or the Internet) may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies.

On the other hand, networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration. The objectives of using technology must be very clear.

Technology is nothing but an enabling tool and it is the deconstruction of the course into its core experiences and its communication to the student regardless of its delivery mechanism that is crucial (Coble, 2016). The technology which can be integrated into the distance education system, based on our experiences, the following factors should be considered:

- Accessibility
- Cost effectiveness
- Human acceptance
- Andragogical suitability

Emerging technologies have thus far afforded the development of a new generation of distance education using voice mail, e-mail, teleconferencing and computer- based integrated telecommunications and multimedia technology. It is hoped that these new educational technologies will enrich the distance interaction between teacher and student and the production of highly interactive self-paced learning packages

used in the distance learning environment. This will be greatly beneficial to the distance learners who carry out their learning anytime and anywhere (Haddad and Draxler, 2002).

The information and communication technology-based media is very important for distance learners. In open and distance education different types of technologies and media are used to transfer education to the learners. Rumble (2019) said that four media namely print, audio, television computer are available for teaching purposes, in one technological form or another. A medium is a generic form of communication associated with particular ways of presenting knowledge. According to Bates (2015) there are five important media in education: direct human contract (face to face), text (including still graphics), audio, television and computing media (e. g. Internet, online technologies). The use of each media gives both variety and the chance of accommodating different learning styles. He goes on to argue that it is better to use a limited range of technologies in order to reduce redundancy and wasteful expenditure; provided all the main media are covered. One medium may serve a teaching function better than another in a particular area. The potential of each technology varies according to how it is used.

It is nowadays more widely recognized that no single medium can be effective for all kinds of learning needs and that each technology has its own strength and weakness. For example, TV is very effective for teaching/learning, requiring pictorial or graphical illustrations, whereas print material is very effective and cost-efficient for the transmission of detailed information. At the same time, the socio-economic, political cultural and geographical background of learners can influence their ability to learn using

different forms of technology. A number of factors need to be taken into consideration when deciding upon the use of any one of the available technologies for course delivery and other purposes. These include factors such as affordability, availability, access and the unique andragogical characteristics of the particular technological application, instructional objectives financial resources available at the institution and student personal resources. The appropriate use of media and technology has provided information access to all students in remote, rural and urban areas as well as across nations (Christina, 2011).

There are a number of factors that need to be taken into consideration before deciding on the appropriate use of media and technology. Siddique (2007) stated that selection of appropriate media for a learning package is a complex decision influenced by a variety of considerations, such as the specific learning objectives of the unit, the nature of subject matter, learner's, background and experiences and the characteristics of the target group as well as practical constraints including availability of infrastructure and financial resources. However, managing technology is no simple task.

The emergence of new global economy has serious implications for the nature and purpose of educational institutions. Hence it is timely that academicians collaborate and cooperate at the national, regional and international level in the optimum utilization of technology to enhance the academic pursuit of knowledge while at the same time to achieving the noble mission of quality education for citizen of the universe. The teacher's guiding is the key factor in ensuring and enhancing the education quality in any education

form (Sadiku, 2018).

**Education-Related ICT Infrastructure in Nigerian Educational System**

The role of Information and Communication Technologies (ICTs) in the 21st century education system has been described as vital to keeping abreast with rapidly changing technologies. The development of information and communication technology into the Nigerian educational system has come to stay; its importance has been translated into huge potentials in terms of positive outcomes, although investments in ICTs in Nigerian's education system have not yielded much when compared to similar investments made in communication (Atureta, 2011).

The field of education has certainly been affected by the penetrating influence of ICT worldwide. ICT has made impact on the quality and quantity of teaching, learning and research in the institutions using it (Kwacha, 2007). According to Ololube, Ubogu and Ossai (2007), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus has radically changed traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both instructors and learners. ICT has the potential to accelerate, enrich and deepen skills, motivate and engage students in learning; helps to relate school experiences to work places, helps to create economic viability for tomorrow's workers, contribute to radical changes in school, strengthens teaching, and provides opportunities for connection between the school and the world (Davis & Tearle, 1999; Yusuf, 2005).

Nigeria as a nation has recognized the potential of ICT in her educational system. The

national policy on computer education emphasized the need for the integration of ICT into the Nigerian educational system. This dates back to the National Policy on Computer Education (FME, 1988) which emphasized the need for primary school pupils to be introduced to the basic computer skills, the use of the computer to facilitate learning and rudimentary use for text writing, computation and data entry. For secondary school, they have related goals which were to be achieved at higher level.

The tertiary institutions were also required to teach computer science as a discipline and to integrate it in school administration and instruction. However, the implementation was not effective. The National Policy on Education (FRN) as revised in 1988 and 2004, re – emphasized the need for the integration of ICT in the Nigerian educational system. This is an acceptance of the need to go beyond computer to the level of ICT also the need for infrastructure. Three major objectives, among others were emphasized in the Nigerian National policy for Information Technology (FRN, 2001).

These are to empower youths with ICT skills to prepare them for competitiveness in a global environment, integrate ICT into the mainstream of education and training and establishment of multifaceted ICT institutions as centers of excellence of ICT. To achieve these objectives, nine major strategies were outlined. These include:

- Making ICT compulsory at all educational institutions
- Developing ICT curricular for all levels of education

- Using ICT in distance education
- ICT companies' investment in education
- Giving study grant and scholarship on ICT
- Training the trainers' scheme for youth corps services on ICT
- ICT capacity building at the zonal, state and local government levels
- Establishing private and public dedicated ICT institutions
- Working with international and domestic initiative to transfer ICT knowledge.

The main purpose of ICT in education means implementing of ICT equipment and tools in teaching and learning process as a media and methodology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues. ICT has enabled learning through multiple intelligence as it has introduced learning through simulation games; this enables active learning through all senses. A renowned Professor Ajayi, G. O. of OAU, Ile Ife, Nigeria, shared the multi-purpose application of ICT as he put it "ICT is now regarded as a Utility such as water and electricity and hence has become a major factor in socio-economic development of every nation (Ajayi, 2013).

ICT now plays a major role in education, learning and research in general, agriculture, health, commerce and even in poverty alleviation by generating or creating new jobs and investment opportunities…" This declaration and indeed other opinions shared by others point to conclusive evidence that ICT has some real and material applications for countries like Nigeria because countries can leverage ICT to totally

transform and modernize their economy. Tinio (2012) noted that ICTs are powerful enabling tools for educational change and reform. When used appropriately, helps expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life.

In Nigerian educational system, ICT has helped to increase access to and improving the relevance and the quality of education. It greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution and widen the range of opportunity for business and the poor. This new communication tends to reduce the sense of isolation, and open access to knowledge. This is enhanced because ICT provides access anytime and anywhere by making possible asynchronous learning. Online course materials, for example, can be accessed 24 hours a day, 7 days a week. ICT based educational delivery like educational programming broadcast over radio and television also dispenses with the need for all learners and the instructor to be in one location. In addition, certain types of ICTs such as teleconferencing technologies enable instructions to be received simultaneously by multiple, geographically dispersed learners (synchronous learning) (Ajayi, 2013).

Furthermore, ICT has enhanced access to remote learning resources. Teachers and learners no longer have to rely solely on physical media housed in libraries (and available in limited quantities) for their educational needs. With the internet and world wide web, a wealth of learning materials in almost every subject and in a variety of media can now be

accessed from anywhere at any time of the day by an unlimited number of people. This is particularly significant for many schools in developing countries and developed countries that have limited outdated library resources. ICTs also facilitate access to resource persons all over the world (Tinto, 2012).

In Nigerian educational system, one interesting thing is that ICTs are also a transformational tool that has promoted the shift to a learner – centered environment. It has assisted in improving the quality of education and training by increasing learners' motivation and engagement, facilitating the acquisition of basic skills. The use of ICT tools such as videos, television and multimedia computer software that combine text, sound and colourful moving images is used to provide challenging and authentic content that engages the students to be more involved. More importantly, networked computers with internet connectivity increases learners motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events (Ibid).

It should be noted that most of the early users of computers were for computer-based learning that focused on mastery of skills and content through reinforcement and repetition. Haddad and Draxier (2002) also indicated that ICT has contributed to effective learning through expanding access, promoting efficiency and improving the quality of learning and improving management systems. According to Obeng (2004), ICT is now regarded as a utility such as water and electricity and hence has become a major role in education, learning and research in general, agriculture, and health and even in poverty

alleviation by generating or creating new jobs and investment opportunities.

David (2005) said that students become more aware about how to learn when using ICT because they must interact with computer. ICT has also changed the relationship between students and lecturers and has made it open and intimate. The idea of sharing knowledge and the capability of using new resources for learning are enhanced by using ICTs. It has also helped undergraduates in better communication and access to information. This is due to the fact that there is a national policy supporting ICT in schools. It has also helped students' curiosity and motivation that has in turn forced the lecturers to seek more knowledge.

The benefits derived from ICT use in education are summarized as active learning, collaborative learning, creative learning, integrative learning and evaluative learning. By active learning, ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus provides platform for students' enquiry, analysis and construction of new information. ICT-supported learning encourages interaction and cooperation among students, teachers and experts regardless of where they are. Also, ICT-supported learning promotes manipulation of existing information and creation of real-world products rather than regurgitation of received information. It has also enhanced integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach. By evaluative learning, ICT-enhanced learning is student – directed and diagnostic. Unlike static, text or print-based educational

technologies, ICTs allow learners to explore and discover rather than mere listening and remembering (Yusuf, 2005).

In our educational institutions, including Adult learning institutions, the mode of delivery of knowledge and curriculum are not yet ICT enhanced, though with the development of a National Policy on ICT in Education, Nigeria is predictably a step in the right direction toward improvement for the sector (Atureta, 2011). Factors militating against its full implementation are insufficient numbers of computers, epileptic power supply, problems of internet network failure, lack of ICT knowledge/skills, difficulty in integrating ICT to instruction, scheduling computer time, insufficient peripheral devices, inadequate software, insufficient teaching time, inadequate access, lack of qualified ICT personnel, cost of equipment, management attitude, there seems to be no clear and definite policy and/or curriculum for all levels of the Nigerian education system and lack of technical assistance among others. Okwudishu (2005) indicated that unavailability of some ICT components in schools hampers teachers' use of it. The various challenges that have been raised have to be addressed for Nigeria to make effective use of ICT to enhance her educational system. Ogechukwu & Osuagwu (2009) suggest that, "ICT is still in the emerging phase in Nigerian educational system". In their article entitled, 'ICT in Education: Achievements so far in Nigeria', which discusses ICT dimensions, its transforming power; status in Nigerian educational institutions, plus limitations to its infusion, both experts say the country is yet to progress beyond the emerging phase of ICT in education which according to them, is only one of four approaches, the goals of

ICT in education embraces. These approaches are: emerging, applying, infusing, and transforming. Iloanusi & Osuagwu said 90% of Nigeria's educational institutions fall within the emerging phase, 7% in the applying phase and 3% in the infusing and transforming phase, with a few other sectors of the economy having progressed beyond this phase.

In addition, Aduwa-Ogiegbean & Iyamu, (2005) noted that many developing countries, especially in Africa, are still low in ICT application and use. Thus, it is believed that in order to emerge beyond the first stage in the last three which are termed the 'functional approaches', a lot of policy implementation and funding is required. Incredibly though, Nigeria is reputed to have an advantage in this 'begging field', as there are many ICT experts of Nigerian parentage in the diasporas, with no knowledge of any concerted effort being made to genuinely attract their potential to accelerate and sustain ICT development in their fatherland. Though government efforts have not gone without much notice toward the implementation of ICT in Nigerian educational institutions, the challenges are there from paucity of funds and lack of access, to unsteady power (not all local ISPs can maintain their boosters for 24-hours without fuel which is costly); and high cost of ownership (with the rapid increase in population and demands across the service sectors, there is the growing realization that in this 21st century, the government of Nigeria alone can no longer fund education and its concerns except by partnering with the private sector).

Special interventions have been made to Secondary and Higher Institutions by

government, NGOs banks and several private sector groups. The MTN Virtual Library project embarked upon in key universities in Nigeria for instance, has enhanced research opportunities; the NUC facilitation of the setting up of Network cables, connectivity devices in Federal Universities with free consultancy services to universities and inter-university centers on ICT; plus the Nigerian Communications Commission (NCC) and Education Trust Fund (ETF) geared towards universities and polytechnics, have enhanced learning in several ways (Ibid).

Be that as it may, the vision to make Nigeria an ICT capable country in Africa and a key player in the information society by using ICT as an engine for sustainable development and global competitiveness is yet to be achieved; this is because ICT is at particularly a dynamic stage in Africa and Nigeria is not left out. Several challenges are responsible for its full actualization. These include the following:

***Digital Divide***

This is the inequality of access to the technology by the students. The cost of a personal (PC) and Laptop are still very high in Nigeria.

***Literacy and Local Content Barrier***

Interfaces have been developed suing icons, graphics, touch screens, and voice recognition for the illiterate and neo-literate. Information available through ICTs is mostly in English, which the majority of developing countries rural communities cannot read. There is a marked shortage of relevant materials in local languages that respond to their needs and this call for "significant investment and support for local content"

(Norrish, O'Frel and Scott, 1999). The project works with NGOs and individuals or organizations using ICTs and living in rural areas. The project has a library of books, microfiche and CD-ROMs that provide appropriate information resources but most of these materials are in English, and may not be appropriate for every region or culture. Thus, there is need to develop more local content in appropriate languages.

***ICT Policy and Implementation***

The absence of policy at the ministerial level has not helped co-ordinate ICT projects and programs being carried out separately by various agencies operating in the education sector. And will lead to resource wastage and duplication.

***Gender Equality***

Traditional daily household demands still take priority over girls' education especially in the northern states.

***Maintenance and Technical Support***

There are few technical staff to maintain the system, this makes it very expensive for few students that have PCs to maintain them when a technical problem is noticed.

***Internet Connectivity***

The cost of accessing internet is still very high in terms of bandwidth. Equipment and connection costs are generally excessive for all developing regions, but are greater obstacle for developing countries in Africa, South Asia, and Latin America and the Caribbean. In Ethiopia, 20 hours of Internet access per month for a year amounts to 8.4 times the GDP per capital. Even for the elite, this amount usage would account for 50

percent of a university professor's take-home pay. The cost of a computer can be ten times the annual GDP per capital of may LDCs in Africa. In Vietnam, yearly dialup accesses to the Intent costs $360, while the annual per capital income is less than $350.

***Inadequate Electrical Power Supply***

The perennial problem in Nigeria is the problem of electricity instability which has been a major setback for our technological development. It is maddening for any establishment to start off new projects without addressing the almighty power supply problem. It is even worse to embark on extensive ICT project within an educational institution without solving power problems first (Adeoye, 2008).

**Summary of Reviewed Literature**

In the summary from the above reviewed literature, the researcher has been able to have review some of the information in the literature that concerns the central themes of this study. The major issues in this regard that we have looked at include such sub-topics as theoretical framework of learning, perspectives on adult literacy, conceptual clarifications of information communication technology and virtual teaching and learning, comparative analysis of virtual and face-to-face learning methods, importance of ICT-based virtual learning system, and education-related ICT infrastructure in Nigerian educational system.

With regard to the theoretical framework of learning, among the many theories in adult education and ICT, the researcher settled for the andragogy model of the humanistic learning theory, a learner-centred theory which helps in effectively designing an online or

virtual environment and in understanding the strengths as well as limitations that are inherent in this type of instructional medium, and balance that with information about how adults learn. The definitions and explanations of adult literacy, information communication technology (ICT), and virtual teaching and learning by different scholars was also explored to give a better understanding of the primary themes of this study

The researcher did a comparative analysis of virtual and face-to-face learning methods on the basis of which we showed that while the former is done largely online, through the internet, the latter is held physically with the teacher and the students seeing each other face-to-face. The merits and demerits of each of the methods were presented without bias. Thereafter, the importance of ICT-based virtual learning system was specifically discussed where emphasis is placed on the virtual learning method as opposed to the face-to-face method.

Finally, the education-related ICT infrastructure in Nigerian educational system was examined where it was discovered that the ICT-based infrastructure in the Nigerian context is very deficient, thereby underlying the necessity for solutions to be sought for, from policies already put in place to availability in skills and resources to enable the effective use of ICT in the teaching and learning of adult learners generally.

# CHAPTER THREE

# RESEARCH METHODOLOGY

This chapter involves an explanation of the research process of the study. With the principal aim of evaluating the use of ICT in the teaching and learning processes amidst pandemic in adult literacy centres in Oredo Local Government in order to bring out the problems and prospects. The chapter therefore includes the following list of procedures:

- Research Design
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of Instrument
- Reliability of Instrument
- Method of Data Collection
- Method of Data Analysis

**Research Design**

The field investigation was conducted with the Dichotomous survey scale research design with a view to evaluating the use of ICT in the teaching and learning of in adult literacy centres in Oredo LGA. The Dichotomous survey scale research design was chosen for this study because it has the advantage that it prevents ambiguous answers that may not prove useful in the study from the respondent, but rather allow for results in a valid and objective manner. Therefore, quantitative data was obtained, which meant that the data could be analysed with relative ease.

**Population of the Study**

The research population was be made up of one hundred and seventy-two (172) staff and students drawn up from three (3) literacy centres in Oredo Local Government Area which included thirty-seven (37) staffs and one hundred and thirty-five (135) learners. The facilitators were chosen because they would provide details about government policies towards ICT-related infrastructure and the level of competence of the school's workforce in using the infrastructure. The learners, at the same time, were chosen as they were the ones to explain their experiences based on whether or not the infrastructure was available and the degree of its functionality.

| S/N | LITERACY CENTRE | NUMBER OF FACILITATOR | NUMBER OF LEARNERS | |
|---|---|---|---|---|
| 1. | Solution School of Reading and Writing | 15 | 50 | |
| 2. | Pioneer Literacy Centre, Giwa-Amu | 12 | 63 | |
| 3. | Legend School of Continuing Education | 10 | 22 | |
| | **TOTAL** | **37** | **135** | **172** |

**Sample and Sampling Techniques**

The method of selecting the participants was the simple random selection method. Twenty-five (25) participants were selected from the facilitators and ninety-five (95) participants made up the samples for the learners which summed up a total of one hundred and twenty participants (120).

The distribution is shown below;

| S/N | LITERACY CENTRE | NUMBER OF FACILITATOR | NUMBER OF LEARNERS | |
|---|---|---|---|---|
| 1. | Solution School of Reading and Writing | 8 | 35 | |
| 2. | Pioneer Literacy Centre, Giwa-Amu | 10 | 40 | |
| 3. | Legend School of Continuing Education | 7 | 20 | |
| | **TOTAL** | **25** | **95** | **120** |

**Research Instrument**

Questionnaire was adopted as the instrument for conducting the inquiry and the questionnaire was entitled “Evaluation of ICT in teaching and learning questionnaire” (EOIITALQ). The researcher structured questions whereby the respondents ticked on available oprtions provided. The questionnaire was designed in a way that items of information required would be easily understood for respondents to promptly fill and return.

The instrument comprised two sections including Section A, with the demographic information of the respondents, and Section B, with statements eliciting information on the role of ICT in the teaching and learning process amidst pandemic in the literacy centres. Each of the items on Section B consisted of two response features of the Questionnaire: Yes and No.

**Validity of the Instrument**

The questionnaire for the study was developed by the researcher. Before embarking on the research proper, the questionnaire being the instrument of research was scrutinized and approved the research supervisor. The suggestions and inputs from the supervisor were incorporated in the final draft of the instrument to ensure the content and construct validity.

**Reliability of Instrument**

To establish the reliability of the instrument, the Test-Retest method was adopted, whereby the respondents were made to answer the same questionnaire after a week of administration of the first and the results were compared and analysed.

**Method of Data Collection**

Copies of the questionnaire were administered to the responding participants personally by the researcher. The respondents were requested to fill the questionnaires within an hour for easy retrieval. During each visitation, the researcher guided the respondents with relevant information needed as they supplied their answers to the questionnaire.

**Method of Data Analysis**

The data information from the field was analysed using mathematical,

computational and statistical methods. Simple statistical tools were used in most cases, frequency in tabular forms and percentages would be used. This was to ensure the data obtained was qualitative and reliable.

# CHAPTER FOUR

# DATA PRESENTATION AND ANALYSIS

This chapter is concerned with the presentation, analysis, interpretation and discussion of results of data collected for the study. The research questionnaire was tested using the stratified sampling technique. The data collected was analysed through the use of simple percentage to evaluate the use of ICT in the teaching and learning processes amidst pandemic in adult literacy centres in Oredo LGA.

The tables of interpretation are as follows.

**Section A: Results of Bio-Data**

**Table 1**

*Gender of Respondents*

| **Gender** | **Number of Respondents** | **Percentage** |
|---|---|---|
| Male | 42 | 35% |
| Female | 78 | 75% |
| **Total** | **120** | **100%** |

Table 1 shows the gender that responded to the questionnaire. Out of the 120 respondents, 42 (35%) were males, 78 (75%) were female. Therefore it implies that majority of female learners participated more in the study. This shows that female learners are many as compared to the males.

**Table 2**

*Level of Respondents*

| Level | Number of respondents | Percentage |
|---|---|---|
| Facilitator | 25 | 20.8% |
| Learner | 95 | 79.2% |
| **Total** | **120** | **100%** |

Table 2 presents the level of the respondents who responded to the questionnaire. Out of the 120 respondents, 25 (20.8%) made up the facilitators and 95 (79.2%) made up the learners at the literacy centres.

**Table 3**

*Age of Respondents*

| Age | Number of Respondents | Percentage |
|---|---|---|
| 18-27 | 69 | 57.5% |
| 28-37 | 33 | 27.5% |
| 38-above | 18 | 15% |
| **Total** | **120** | 100% |

Table 3 shows the age of the respondents who responded to the questionnaire. The respondents were drawn from different age grades to ensure the reliability of the research. Out of 120, respondents between the age grade of 18-27 were 69 (57.5%), respondents between the agre grade of 28-37 were 33(27.5%),respondents between the age grade of

38 -above were 18 (15%). This analysis implies that majority in the age range between 18-27 attended the literacy centres selected for the participation of the study.

**Section B: Results and Discussion**

Research Question 1: What is the Level of availability of ICT Infrastructure in Adult Literacy Centres?

**Table 4**

*Availability of ICT Infrastructure in Adult Literacy Centres*

| **Items** | **Positive Response** | **Percentage** | **Negative Response** | **Percentage** |
|---|---|---|---|---|
| Adult Literacy Centres make plans for ICT equipments | 21 | 17.5% | 99 | 82.5% |
| Facilitators use internet related materials in teaching learners | 24 | 20% | 96 | 80% |
| The Centres are well equipped with computers and gadgets | 12 | 10% | 108 | 90% |
| Internet is always available for use | 21 | 17.5% | 99 | 82.5% |

From Table 4, item one shows that 17.5% agree that Adult Literacy Centres make plans for ICT equipments while 82.5% disagree. In item two, 20% agree that Facilitators

use internet related materials in teaching learners while 80% disagree with the statement. For item item three, 10% of the 120 respondents provided a positive response to the statement "The Centres are well equipped with computers and gadgets" while 90% negated against it. In item four, 17.5% were in support, stating that internet is always available for use, while 82.5% disagreed with the statement.

Following the interpretation of the data acquired from the respondents, it can be concluded that there is generally minimal availability of ICT infrastructure in Adult Literacy Centres in Oredo Local Government Area.

Research Question 2: How Useful are the available ICT facilities in Adult Literacy Centres?

**Table 5**

*Influence of ICT facilities in Adult Literacy Centres*

| **ITEMS** | **Positive Response** | **Percentage** | **Negative Response** | **Percentage** |
|---|---|---|---|---|
| Lectures are easily understood with ICT teaching aids | 36 | 30% | 84 | 70% |
| Learners are always interested in classes where ICT teaching aids are present | 105 | 87.5% | 15 | 12.5% |
| Lessons taught with ICT gadgets are easily remembered | 80 | 66.7% | 40 | 33.3% |
| ICT has increased Learners ability to learn | 87 | 72.5% | 33 | 27.5% |

The statistics of Table 5 presents Item one as having a larger percentage of 70% in the negative response to the statement 'Lectures are easily understood with ICT teaching

aids' and a lesser percentage of 30% had a positive response to the statement, which means that the learners in Adult Literacy Centres do not easily understand lectures where there is the use of ICT teaching aids. Under item two, 87.5% agreed that Learners are always interested in classes where ICT teaching aids are present, while 12.5% disagreed. In item three of Table 5, out of the 120 respondents, 66.7% agreed with the statement 'Lessons taught with ICT gadgets are easily remembered' while 33.3% disagreed. The response in this item can be concluded as meaning learners could easily recall lessons taught with the use of Information Communication and Technology in Adult Literacy Centres. Item four had 72.5% of the respondents agreeing to the statement that ICT has increased Learners ability to learn while 27.5% disagreed with the statement.

From the above statistics, it can be concluded that lectures given to Adult Learners in Literacy Centres are not easily understood when facilitators make use of the available ICT facilities, which has made it hard to keep introducing other available ICT facilities. However, when understood, learners have an easy time recalling the lessons that facilitators use the available ICT facilitators to teach. This also allows for the interest of learners when ICT facilities are involved in a class or lesson particular to their felt needs and increased learners ability to learn.

Research Question 3: To what extent can the potential opportunities provided by ICT facilities in Adult Literacy Centres be enhanced for sustainable use?

**Table 6**

*Effect of potential opportunities on Adult Literacy Centres ICT facilities*

| **Items** | **Positive Response** | **Percentage** | **Negative Response** | **Percentage** |
|---|---|---|---|---|
| Training Facilitators on the use of ICT will make teaching-learning better | 99 | 82.5% | 21 | 17.5% |
| Provision of ICT Infrastructure will improve Learners interest | 105 | 87.5% | 15 | 12.5% |
| Good ICT equipment will make facilitators better | 93 | 77.5% | 27 | 22.5% |
| Constant ICT facilities will enable continuous virtual learning | 117 | 97.5% | 3 | 2.5% |

From the data in Table 6, it was revealed that 82.5% out of the 120 respondents accepted that "Training Facilitators on the use of ICT will make teaching-learning better" and in turn enable sustainable use of ICT facilities in Adult Literacy Centres. But 17.5% out of the 120 respondents disagreed with the statement. In item two, under Table 6, 87.5% of the respondents believed that the Provision of ICT Infrastructure will improve

Learners Interest, while 12.5% did not believe so. For item four, it can be observed that 93 (77.5%) of the total respondents provided a positive response to the statement 'Good ICT equipment will make facilitators better', the other 27 (22.5%) provided a negative response, disagreeing with the statement. Again, the researcher was interested in finding out if Constant ICT facilities will enable continuous virtual learning. 97.5% of the respondents agreed with the statement, while 2.5% disagreed.

On the basis of the analysis, it can be concluded that the extent the potential opportunities provided by ICT facilities in Adult Literacy Centres for Sustainable Use would have to involve training of facilitators on the use of ICT in order to improve the teaching-learning process for both the learners and the facilitators. Also, the provision of ICT infrastructure would improve the interest of learners in the Adult Literacy Centres, good ICT facilities made available for facilitators will make them better in turn improving the teaching-learning process and constant ICT facilities will enable continuous virtual learner for learners.

Research Question 4: How has ICT infrastructure been used in improving the teaching-learning during the COVID19 pandemic in Adult Literacy Centres?

**Table 7**

*Effect of ICT in Covid19 Pandemic in Adult Literacy Centres*

| **Items** | **Positive Response** | **Percentage** | **Negative Response** | **Percentage** |
|---|---|---|---|---|
| There was no stop in learning due to the use of ICT | 90 | 75% | 30 | 25% |
| There was feedback from Facilitators | 114 | 95% | 6 | 5% |
| Learners got adequate information from the Facilitators about the Virus and their learning | 110 | 92.3% | 10 | 7.7% |
| After lockdown, ICT gadgets were available for the teaching-learning process | Nil | - | 120 | 100% |

From Table 7 above, in item one 75% agreed that there was no stop in learning due to the use of ICT during the COVID19 Lockdown, while 25% disagreed, saying there was stop in learning during the COVID19 Lockdown. Under item two, 114 (95%) of the total respondents affirmed that there was feedback from Facilitators during the the lockdown, which means the learners got the adequate feedback as regards their learning activities. 5% opined the negative. For item three, 92.3% agreed that Learners got adequate information from Facilitators about the virus and their learning during the lockdown, which means there was the adequate distribution of information on how the

learners ought to have protected themselves from the virus and also on their individual learning activity. A percentage of 7.7% disagreed with the statement. All the respondents (100%) in the study disagreed that after the lockdown ICT gadgets were made available for the teaching learning process.

From the analysis, it can be observed that during the COVID19 pandemic and lockdown, there were steps taken by Adult Literacy Centres to enable the continuation of learning for the learners. These the use of the available gadget to provide feedback and information on the virus and their learning. However, after the suspension of the lockdown and reintroduction of face-to-face activities, there was no provision for ICT facilities to aid better teaching-learning in Adult Literacy Centres.

Research Question 5: What are the challenges hindering the effective use of ICT facilities in Adult Literacy Centres?

**Table 8**

*Challenges of ICT in Adult Literacy Centres*

| **ITEMS** | **Positive Response** | **Percentage** | **Negative Response** | **Percentage** |
|---|---|---|---|---|
| Poor electricity is a major hindrance to the use of ICT | 99 | 82.5% | 21 | 27.5% |
| Facilitators have adequate knowledge in the use of ICT Infrastructure | 81 | 67.5% | 39 | 32.5% |
| The cost of accessing the internet service is moderate | Nil | - | 120 | 100% |
| Few technical staffs affect the availability of ICT equipment | 12 | 10% | 108 | 90% |

Out of the 120 respondents in the study, 82.5% agreed that Poor electricity is a major hindrance to the use of ICT, while 27.5% disagreed with the statement. Also, in item two, 67.5% of the total respondents agreed that Facilitators have adequate knowledge on the use of ICT infrastructure while 32.5% did not agree with the statement. All of the respondents unanimously disagreed with the statement that The cost of accessing the internet service is moderate which means 100% of the respondents believe that the cost of accessing the internet is expensive. In item four, 10% of the respondents agreed that few technical staffs affect the availability of ICT equipments in Adult Literacy Centres while 90% disagreed.

From the analyses of the response in Table 8, it can be concluded that the challenges hindering the effective use of ICT facilities in Adult Literacy centre include poor electricity and the cost of internet to enable learners make use of online medias especially when there is no means for physical face-to-face activities. However, it can be noted that facilitators have adequate knowledge of the available ICT gadgets and equipments for teaching and learning, and the availability of only few technical staffs does not affect the availability of ICT infrastructure.

**Discussion of Findings**

The purpose of this section is to discuss the findings of the study based on the opinions of facilitators and learns in order to evaluate the use of ICT in the teaching and learning process amidst pandemic in adult literacy centres in Oredo LGA. The study has shown that Adult Literacy Centres in Oredo Local Government Areas have an inadequate number of ICT infrastructure available for use to enhance the teaching-learning process for both facilitators and learners in the literacy centres.

The findings from Table 5 also revealed that when facilitators use the available facilities, lectures given to adult learners in literacy centres are not understood easily. This makes it difficult to continue introducing other available ICT facilities. However, once understood, learners have a relatively easy time remembering the lessons that facilitators teach using the available ICT gadgets and equipment. This also allows for increased learner interest when ICT facilities are used in class or lessons specific to their perceived needs, as well as increased learner ability to learn. The study also revealed that,

in order to ensure the long-term use of ICT infrastructure in Adult Literacy Centres, ICT training for facilitators would go a long way to enhance the teaching-learning process for both the learners and facilitators. Furthermore, the provision of ICT infrastructure would increase learners interest in Adult Literacy Centres; good ICT facilities made available to facilitators would improve them, thereby improving the teaching-learning process. Consistent ICT facilities would enable continuous virtual learning for learners.

According to the findings in Table 7, Adult Literacy Centres took steps to ensure that learners could continue their education during the COVID19 induced lockdown. These are the applications that make use of the available gadgets to provide feedback and information about the virus and their learning. However, after the lockdown was lifted and face-to-face activities resumed, there was no provision for ICT facilities to aid better teaching-learning in Adult Literacy Centres. The study, from the presentation of the findings in Table 8 presented the challenges impeding the effective use of ICT facilities in Adult Literacy centres which includes poor electricity and the cost of internet to enable learners make use of internet based forms of communication particularly if there is no means for physical face-to-face activities. Conclusively, it should be noted that facilitators have adequate knowledge of the available ICT gadgets and equipment for teaching and learning, and the availability of just a few technical staff or facilitators not effect on the availability of ICT infrastructure.

## CHAPTER FIVE

## SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter deals with the summary of the study, the conclusion drawn from the analysis of data obtained and interpretation of findings and recommendation based on findings made.

**Summary**

This study evaluated the use of ICT in the teaching and learning processes amidst COVID-19 pandemic in Adult Literacy Centres in Oredo LGA. The population of the study comprised of facilitators and adult learners in three Adult literacy centres in Oredo Local Government Area of Edo State. The study comprised a sample of 120 respondents (25 facilitators and 95 learners), who were selected using the simple random selection method technique.

In the course of carrying out the research, five research questions were raised as the blue-print for the study. The research questions include;

- What is the level of availability of ICT infrastructure in the Adult Literacy Centres?
- How useful are the available ICT facilities in the Adult Literacy Centres?
- To what extent can the potential opportunities provided by the ICT facilities in Adult Literacy Centres be enhanced for sustainable use?
- How has ICT infrastructure been used in improving the teaching-learning during the Covid-19 Pandemic in Adult Literacy Centres?
- What are the challenges hindering the effective use of ICT facilities in Adult Literacy Centres?

The instrument for data collection was the questionnaire. The questionnaire

comprised of 20 items to enable the proper analyses and evaluation of the research question raised. The questionnaire was made up of Section A and Section B, while Section A contained the demographic information of the respondents. Section B was meant to elicit data on the various research questions raised. The data obtained were analysed using frequency counts and simple percentage. The reliability of the instrument was ascertained using the test-retest method.

**Conclusion**

Based on the analysed data and interpretations from the analyses, the following are the prominent findings;

Adult Literacy Centres have made use of minimum ICT mediums and equipment for teaching adult learners, that is there is no adequate necessary ICT facilities. This is, sometimes, due to the fact that adult learners find it hard to understand lessons where ICT is used. However, Adult Learners remember and recall lessons and classes where ICT has been used to teach them.

Sustainability in the use of ICT is achievable only if there is training of facilitators on how to make use of available for the proper teaching of the adult learners.

During the COVID19 pandemic induced lockdown, there was communication and continuation of teaching and learning. That is the learners had access to their facilitators and got the necessary educational and environmental information. However, it can be noted that there was no improvement in the classroom setting to include ICT facilities for

the betterment of the teaching and learning process.

Problems that affect the use of ICT in Adult Literacy Centres include poor electricity and the cost of internet that affects how the adult learner access internet based ICT mediums for their learning.

The knowledge of the facilitators and availability of technical staffs do not necessarily fall under the problems that affect the use of ICT in Adult Literacy Centres.

Therefore, it can be noted that there is need for the continuous use of ICT to improve the teaching and learning of adult literacy centres, because learners from the Adult Literacy Centres used in this study opined that they take interest in classes where ICT is used. Furthermore, with the appearance of the COVID19 virus, there is a necessary need for the involvement of ICT mediums in order to improve, as well as continue the teaching and learning in adult literacy centres in Oredo Local Government Area.

**Recommendation**

Based on the conclusions drawn from the findings, the following recommendations are therefore presented;

1. The Ministry of Education, alongside the Edo State Agency for Adult and Non Formal Education and private Adult Literacy Centres should make provisions for more ICT equipment such as visual and audio visual gadgets that can pique the interest and sustain the continuity of teaching and learning process.
2. The Facilitators in the Adult Literacy Centres should be given proper training on

the use of ICT as teaching aids to enable a better experience for the learners. This is the steps to encouraging sustainability in the use of ICT.

3. All Adult Literacy Centre, with the involvement of the Government, should make available necessary ICT equipment for the teaching and learning because of the increase in the COVID19 pandemic, in order to prevent cases of illness happening to the Adult Learners themselves.
4. The issues of electricity should be addressed for there to be a complete integration of ICT into the teaching and learning process in Adult Literacy Centres. Also, the government should address the issue of the internet cost that limits learners from easily accessing internet based media to carry out educational activities virtually.

**Suggestions for Further Studies**

In relevance with the delimitation of the study which were presented in the first chapter, suggestions for further studies include;

Impact of Information and Communication Technologies on Facilitators Skills in Adult Literacy Centres

Assessment of Government Involvement in Implementation of ICT Infrastructures Admist COVID-19 Pandemic in Adult Literacy Centres

Effects of COVID-19 Lockdown on the Performance of Adult Literacy Learners: A Case Study

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## APPENDIX

## DEPARTMENT OF ADULT AND NON-FORMAL EDUCATION, FACULTY OF EDUCATION, UNIVERSITY OF BENIN,

# BENIN CITY.

## QUESTIONNAIRE

This questionnaire is designed by the researcher to collect relevant data that will be useful in Evaluating the Use of ICT in the Teaching and Learning Processes Amidst Pandemic in Adult Literacy Centres in Oredo Local Government Area.

Respondents are kindly requested to read the questions carefully and provide the appropriate answer by simply ticking (√) one of the boxes provided for each question.

**SECTION A: BIO-DATA**

1. Gender: Male ( ) Female ( )
2. Level: Administrator ( ) Facilitator ( ) Learner ( )
3. Age: 18-27 ( ) 28-37 ( ) 38-above ( )

**SECTION B**

Please tick (√) any one considered most appropriately correct for every item.

**YES = AGREE**

**NO = DISAGREE**

**A. WHAT IS THE LEVEL OF AVAILABILITY OF ICT INFRASTRUCTURE IN ADULT LITERACY CENTRES?**

| S/N | ITEMS | YES | NO |
|---|---|---|---|
| 1. | Adult Literacy Centres make plans for ICT equipments | | |
| 2. | Facilitators use internet related materials in teaching learners | | |
| 3. | The Centres are well equipped with computers and gadgets | | |
| 4. | Internet is always available for use | | |

**B. HOW USEFUL ARE THE AVAILABLE ICT FACILITIES IN ADULT LITEARCY CENTRES?**

| S/N | ITEMS | YES | NO |
|---|---|---|---|
| 5. | Lectures are easily understood with ICT teaching aids | | |
| 6. | Learners are always interested in classes where ICT teaching aids are present | | |
| 7. | Lessons taught with ICT gadgets are easily remembered | | |
| 8. | ICT has increased Learners ability to learn | | |

**C. TO WHAT EXTENT CAN THE POTENTIAL OPPORTUNITIES PROVIDED BY THE ICT FACILITIES IN ADULT LITEARCY CENTRES BE ENHANCED FOR SUSTAINABLE USE?**

| S/N | ITEMS | YES | NO |
|---|---|---|---|
| 9. | Training Facilitators on the use of ICT will make teaching-learning better | | |
| 10. | Provision of ICT Infrastructure will improve Learners interest | | |
| 11. | Good ICT equipment will make facilitators better | | |
| 12. | Constant ICT facilities will enable continuous virtual learning | | |

**D. HOW HAS ICT INFRASTRUCTURE BEEN USED IN IMPROVING THE TEACHING-LEARNING DURING THE COVID19 PANDEMIC IN ADULT LITEARCY CENTRES?**

| S/N | ITEMS | YES | NO |
|---|---|---|---|
| 13. | There was no stop in learning due to the use of ICT | | |
| 14. | There was feedback from Facilitators | | |
| 15. | Learners got adequate information from the Facilitators about the Virus and their learning | | |
| 16. | After lockdown, ICT gadgets were available for the teaching-learning process | | |

**E. WHAT ARE THE CHALLENGES HINDERING THE EFFECTIVE USE OF ICT FACILITIES IN ADULT LITEARCY CENTRES?**

| S/N | ITEMS | YES | NO |
|---|---|---|---|
| 17. | Poor electricity is a major hindrance to the use of ICT | | |
| 18. | Facilitators have adequate knowledge in the use of ICT Infrastructure | | |
| 19. | The cost of accessing the internet service is moderate | | |
| 20. | Few technical staffs affect the availability of ICT equipment | | |