

## **An Appraisal of the Role of Information Communication Technology (ICT) for Quality Education in Nigerian Tertiary Institutions**

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### **Abstract**

In many facets of human existence, including education, information and communication technology (ICT) has become an inseparable element. ICT has begun to make an appearance at Nigerian higher institutions, although its influence has been limited. The transition of the world to digital media and information has increased the importance of ICT in education, which will continue to expand and develop in the twenty-first century. ICT is an integral aspect of today's world. By replacing old methods of teaching and learning with modern, computer-based procedures, ICT alters the educational system. This study emphasizes the importance of information and communication technology (ICT) in tertiary education in Nigeria. In Nigerian higher institutions, ICT has unquestionably influenced the quality and quantity of teaching, learning, and research. The study goes on to explore the benefits of having ICT infrastructure in Nigeria tertiary institutions, such as e-learning/virtual libraries, and access to excellent education for learners with special needs. The many barriers to ICT adoption must be given special consideration. Government financing of ICT infrastructure, good policy legislation, and execution and development of necessary skills are all critical for ICT to continue playing its high role as a change agent in bringing about excellent education in Nigerian tertiary institutions, according to the report.

**Keywords:** Education, ICT, Electronic Learning, Quality Control, Tertiary Institutions

### **Introduction**

Quality education is defined as education that meets the pedagogical and developmental needs of each individual; it is inclusive and organized to help each individual fulfill their full potential, regardless of location or economic condition. Quality education is a single UN Development

Programme objective (SDG4) focusing only on education, with the purpose of ensuring inclusive and equitable quality education and promoting lifelong learning (Sean Slade, 2017). Education is described as the process of gaining or enabling information, skills, values, morals, beliefs, habits, and personal growth. It is a potent tool for social, political, and economic improvement, without which no individual or society can achieve professional advancement. It is the foundation for human progress and civilisation. Tertiary education, which includes post-secondary education, is the third layer of the educational system.

Tertiary education is defined by the Federal Republic of Nigeria (2014) as education provided beyond secondary school at universities, colleges of education, polytechnics, and monotechnics, as well as institutions that provide correspondence courses. Tertiary education is critical for promoting growth, alleviating poverty, and increasing shared prosperity. It is highly significant since it benefits not just the person but the entire community. The integration of ICT into higher education allows students to access more sophisticated and broad fields of study in order to improve their analytical skills. ICT is an essential component of today's world. It's a force that's altered many elements of people's lives. ICT has had a massive influence on all disciplines during the last two or three decades. The use of ICT in education as a way of improving skills and increasing capacity for economic growth is crucial to bringing about sustainable improvements in the educational system (Damkor Matthew, Irinyang Danjuma Joro, Haruna Manasseh 2015). Professionals in the field of education have stated that when correctly employed, ICT has enormous potential for improving teaching and learning, resulting in the expected quality education.

Nigeria has demonstrated consistent its commitment to the SDGs promise via leadership and ownership of the implementation process, as it strives to maintain its leadership role in Africa and the globe at large. In order to achieve SDG4, significant efforts have been made to focus greater attention on improving education, particularly in Nigerian tertiary institutions. Adoption of ICT in Nigeria's tertiary education is one of the ways to achieve this. The ICT is a priceless contemporary intervention. Its intrinsic characteristics, including as precision, high-speed performance, dependability, and the capacity to store extremely vast volumes of data, have allowed it to be used

to all human endeavors, including education and research. This research aims to assess the function of ICT as a motivator for excellent education in Nigeria's higher institutions.

## **Review of Related Literature**

### **Conceptual Clarification**

#### **Education**

Education is a crucial national development investment. It is the process of acquiring knowledge, which encompasses all of the processes through which an individual develops talents, attitudes, and other types of behavior that are beneficial to the society in which he or she lives (Oluwagbohunmi, 2013). It is the transmission of culture in terms of continuity and expansion, or the dissemination of information to ensure the logical direction of society, or both" (Adu, Emunemu, & Oshati, 2014). The importance of education in development cannot be overstated, since it provides the drive for development to harness human resource development and material resources (World Bank, 2005). Education is compatible with national growth in this way. Sustainable education's revolutionary potential boosts national development. This just supports the argument that education is critical to national growth.

#### **Tertiary Education in Nigeria**

The federal, state, and municipal governments in Nigeria are in charge of education. Nigeria's education system is divided into three tiers: basic education, post-basic/senior secondary education, and post-secondary/tertiary education. The Federal Ministry of Education is in charge of general policy formation and quality supervision. The National University Commission (NUC) is a government-run body that governs higher education administration in Nigeria (Nina Arnhold 2021). Tertiary education encompasses all forms of official post-secondary education, including public and private universities, colleges, technical training institutions, and vocational schools. The development of applicable high-level personnel, the growth of individual intellectual potential, and the learning of physical and intellectual skills are all purposes of higher education. These aims are pursued by tertiary educational institutions through teaching, research, knowledge

development, and dissemination, which they do through a range of programs such as certificate, diploma, undergraduate, and postgraduate courses (Oyebade & Dike, 2013).

University education, in particular, helps to produce high-level workers in a variety of professional fields, as determined by national development needs. University education also focuses on building a sense of community among students through projects and action research. Tertiary education is in high demand, owing to a growing awareness of its value for a country's economic and socio-cultural growth, among other factors. Tertiary education enriches society as a whole, not just the individual. It helps to promote growth, reduce poverty, and increase shared wealth.

In any civilization, a highly trained workforce with lifetime access to a quality tertiary education is required for innovation and progress. Graduates with higher education are more ecologically concerned, have better habits, and participate in civic activities at a higher rate. Increased tax revenues from greater salaries, healthier children, and smaller families all contribute to nations being stronger (Terlumun Mark Ijov and Wombu Ruth Nguzan, 2019). In short, higher education institutions equip people to be active citizens of their communities and societies in addition to providing them with necessary and relevant employment skills (Nina Arnold, 2021).

### **Quality Education**

The term "quality education" refers to a form of education that is concerned with its quality. In education, quality implies "fitness for purpose," which means that the quality of education in any community must be measured against what that culture views to be the aim of education (Anikweze 2011). The clarified objectives of section 20 of the 1979 Nigeria constitution state that the educational system shall be of the type that motivates and stimulates creativity and draws heavily on our traditions of moral principles that include honesty for positive Nigerian moral and religious values, ensure consistency of traditional family values and their progressive upgrading to meet modern concept, produce professional competence and a decided to order society, and so on. This means that the educational system should assist students in developing the habits, skills, opinions, tastes, and virtues required for the maintenance of our cultural norms and the thriving of moral principles (Oluwagbohunmi, 2013).

The capacity of a school to offer the essential facilities to enhance teaching and learning that can lead to the attainment of educational goals in accordance with mandated accepted worldwide standards is referred to as quality education (Pius & Aii, 2019). It is an investment in individuals with significant societal benefits. One of the United Nations Development Programme's (UNDP) Sustainable Development Goals (SDG 4) agreed in 2015 is quality education. By 2030, it aims to offer universal access to high-quality education and encourage lifelong learning across the world (Slade, 2017). In a statement in support of the SDGs and the pursuit of quality education for all, the Association for Supervision and Curriculum Development (ASCD) and Education International (EI) defined quality education as education based on the child benefit of the entire, that is, the social, mental, emotional, physiological, and cognitive development of each student irrespective of gender, race, ethnicity, economic status, or geographical area. It not only prepares the youngster for testing or examination, but also for life.

Quality education provides resources and directs policy to ensure that each child enters school healthy and learns about and practices a healthy lifestyle; learns in an environment that is physically and emotionally safe for students and adults; is actively engaged in learning and is connected to the school and broader community; has access to personalized learning and is supported by qualified, caring adults; and is challenged academically and prepared for success in college or further study and employment and participation in a global environment. Quality education provides the outcomes needed for individuals, communities, and societies to prosper. It allows schools to align and integrate fully with their communities and access a range of services across sectors designed to support the educational development of their students. Each child enters school healthy and learns about and practices a healthy lifestyle; learns in a physically and emotionally safe environment for students and adults; is actively engaged in learning and related to the school and broader society; has access to essential learning and is substantiated by qualified, responsible adults; and is challenged scholastically and equipped for success in co-curricular activities. Individuals, communities, and society prosper when they have access to high-quality

education. It helps schools to align and integrate fully with their communities, as well as access a variety of resources from many sectors that promote their kids' educational growth.

### **Information Communication Technologies (ICT)**

ICTs are technologies that employ electronic methods to transmit, alter, and store data. E-mail, SMS, text messaging, and video chat (e.g., cellphones, desktops, and laptops) are examples of communication and information technologies (Mathevula & Uwizeyimana, 2014).

Computers, software, networks, satellite linkages, and associated systems are referred to as ICT. They allow individuals to access, analyze, create, share, and use data, information, and knowledge in previously inconceivable ways (Barakabitze et al, 2019). It refers to telecommunications-based technologies that give information access. The internet, wireless networks, cell phones, and other forms of communication are all examples of this. ICT is cutting-edge and active. It has transformed society into a global village over the previous few decades by providing a huge array of communication options. It has handled information effectively and efficiently using a variety of technical tools and resources, and it is quietly contributing to society's general growth and development. ICT has been identified as a worldwide driver for change. In current day of globalization, it is a necessary component of the growth of every aspect of any nation. In the twenty-first century, it is acting as a catalyst for change in the manner and quality of learning in academic institutions across the globe. It has quickly become one of the fundamental building blocks of modern society.

### **ICT and Education**

The use of ICT in education as a way of improving skills and increasing capacity for economic growth is crucial to bringing about sustainable improvements in the educational system (Aduwa-Ogiegbaen & Iyamu, 2005). Computers and their peripherals such as printers, software, scanners, and projectors are used in education to teach and learn. Indeed, ICT represents a paradigm change in how humans use computers and the internet to interpret information. It has changed the model of information sharing from static to dynamic. The integration of ICT into higher education allows students to access more sophisticated and broad fields of study in order to improve their analytical

skills. Because of its dynamic interactive and interesting content, ICT improves teaching and learning. It has the ability to stimulate, enrich, and strengthen skills, engage and motivate students' learning, aid to link school knowledge to work procedure, and help to develop economic potential for today's workers; it adds to the tertiary institution's developmental process; it enhances student learning; and it creates opportunities for correlation between the higher education institution and the rest of the world (Dave & Tearle, 2010). Through a range of technologies to enhance and facilitate instructors' professional activities, ICT may help tertiary institutions become more efficient and productive (Adeoye, Oluwole, & Loto, 2013). It allows students to contact with each other via e-mail, mailing lists, chat rooms, and other means. It allows for faster and more convenient access to more comprehensive and up-to-date information. ICT may also be utilized to complete more difficult jobs since it offers researchers with a consistent means of disseminating research papers and conclusions (Owoyale-Abdulganii & Olaniyi, 2021). Ghavifekr, Kunjappan, Ramasamy, & Anthony (2016) described the three important motivations for ICT in education, as follows:

- i. As a tool for resolving issues in effectively teaching: ICT provides the capabilities for effective teaching and learning delivery, management, and support.
- ii. ICT can change the content, methods, and overall quality and quantity of teaching and learning, reducing teachers' workload and ensuring constructivist inquiry-oriented classrooms; and
- iii. As a central force throughout economic competitiveness:
- iii. As a crucial component in economic and social shift patterns that have technological skills important to today's students' employment prospects.

## **Theoretical Review**

### **Theory of Technology Acceptance Model (TAM)**

The technology acceptance model (TAM) is a theory of information systems that describes how people adopt information systems. It asserts that users' behavioural intentions, which are defined by the perception of technology's utility in accomplishing the job and perceived ease of use, predict users' adoption of technology.

It was one of the most important models of technology adoption, developed by Fred Davis and Richard Bagozzi (1989), with two major elements affecting an individual's desire to utilize new technology: perceived ease of use and perceived utility. An older adult who views digital games as too difficult to play or a waste of time is unlikely to want to learn how to use them, but an older adult who views them as offering required mental stimulation and being simple to learn is more likely to want to learn how to use them. TAM has been challenged for a variety of reasons, but it is a helpful overall framework that is compatible with a number of studies on the elements that impact older individuals' willingness to embrace new technology (Braun, 2013). This theory is well-placed in this research since the goal of the study was to assess the impact of information technology in attaining excellent education in Nigerian tertiary institutions.

### **Empirical Review**

Ifeakor (2021) investigated the impact of information and communication technology (ICT) on teaching and learning English in Nigerian tertiary institutions during the COVID-19 pandemic. During the COVID-19 epidemic, the research looked at the impact of adopting ICT in teaching and studying English in Nigerian postsecondary institutions. The study found that students could do very well using one or both of the mediums of classroom instruction because academic achievement is regardless of the media, institutions that really do not incorporate ICT into learning are now embracing this technology, and ICT learning can completely consider replacing classroom experience of the English language. According to the findings, greater effort should be done to improve the learning process in general and prepare for future pandemics like this one.

In the middle of the COVID-19 pandemic in Kwara State, Owoyale-Abdulganiy and Ayuba (2021) investigated the use of information and communication technology for teaching Islamic studies. During the Covid-19 lock-down in Kwara State, Nigeria, the research looked into the use of information and communication technology (ICT) tools for teaching and studying Islamic studies. The three senatorial districts of the state were sampled using a basic random sampling approach. Smartphones, radio, television, and a variety of programs like as Whatsapp, Zoom, Telegram, Facebook, Google, 2go, Twitter, Instagram, and a slew of others were all heavily utilized to teach

and learn Islamic studies in Kwara State during the Coronavirus lock-down. It was proposed that in order to improve the effectiveness and efficiency of Islamic studies teaching and learning through virtual learning, instructors and students should receive extensive training on how to make the most use of ICT resources.

During the COVID-19 Pandemic, Alaa and Abd Rahman (2020) investigated the impact of ICT on knowledge sharing among academic staff. The influence of ICT and ICT infrastructure on knowledge sharing among academic personnel was investigated in this study. The stratified sample approach was used in this investigation. ICT and ICT infrastructure have a favorable and considerable influence on Knowledge Sharing among academic staff at Iraqi public institutions. The research proposed that the government and universities work together to strengthen and improve ICT infrastructure, which would boost both the reputation and ranking of Iraqi institutions.

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Kehdinga (2019) investigated the role of ICT in African higher education. The study looked at the role of ICT and its capacity to improve education quality in African higher education institutions. The study discovered the benefits of having ICT infrastructure at higher education institutions across Africa, such as e-learning/virtual libraries, and access to excellent education through customized tools for physically challenged students. The study found that government funding of ICT infrastructure is critical for improving the quality of education in tertiary institutions, and it recommended that the government implement ICT policies, provide adequate funding for ICT infrastructure, and monitor ICT infrastructure in various tertiary institutions to ensure that ICT appliances is not neglected but is in use.

The Impact of ICT on Tertiary Institutions was investigated by Ijov and Wombu (2019). The study looked at the varied effects of ICT on tertiary institutions as well as the primary roadblocks to ICT use and implementation in higher institutions. According to the study, tertiary institutions should be equipped with modern and advanced technological infrastructure to allow for the effective use of appropriate technologies for teaching and learning programs, and government at all levels should make adequate funds and resources available, particularly for the funding and sustainability of tertiary education.

Mailuno and Mimi (2019) looked at Nigeria's Vision 20:2020 and the Implications of Quality Education in Nigeria for Sustainable Development. The study looked at education as a concept, as well as quality education, national stability, and long-term growth. The study concluded that Nigeria's vision to re-energize the education sector and restore the country's educational standards is consistent with the Transformation Agenda and the Vision 20-2020 of the Federal Republic, and that the noble policies of the Transformation Agenda and the Vision 20-2020/Vision 15- 2050 of the Federal Republic of Nigeria should be religiously followed and implemented, as well as the issue of quality assurance in the educational sector.

ICT Awareness among Faculty Members of Pakistan's Public Sector Women Universities was researched by Shahida and Kiran (2018). The study looked at faculty members' knowledge, attitudes, and skills in using ICTs at Pakistani women's institutions. The research employed a questionnaire-based survey design. Faculty members have a good attitude toward computers, although they have a poor degree of competency in utilizing ICTs, according to the survey. The study stated that faculty members at Pakistan's public sector women's universities are aware of the need for and importance of ICTs in the education sector, and that the institution should provide ICT training for them so that they may influence the country's future.

The role of ICT in the Nigerian educational system was investigated by Damkor, Irinyang, and Haruna (2015). The study looked on the role of ICT in Nigeria's educational system. According to the research, Nigeria still has a long way to go in terms of implementation, which is widening the digital and knowledge gaps, and access to ICT infrastructure remains a key concern for most African nations. Despite the importance of ICT in education, the study found that Nigerian schools

have yet to fully use technology for teaching and learning. Efforts to integrate ICT into the educational system have had little impact, and it has been recommended that the government should post and give ICT-skilled instructors to each school to impart ICT skills to students, as well as stabilize Nigeria's energy supply.

## **Methodology**

This is an exploratory study that considers the educational sector's experiences, perspectives, and socially constructed realities in Nigeria. The study takes a secondary research strategy, in which the researchers make their decisions fully based on a survey of the literature on the use of ICT to attain excellent education in Nigerian tertiary education.

## **Discussion of Findings**

### **Role of ICT in Quality Education in Nigeria Tertiary Institutions**

In Nigeria, the integration of ICT into higher education institutions is progressively taking shape, with some institutions recognizing its potential to improve, enrich, and support both professors and students in their teaching and learning processes (Murgor, 2015). Recognizing the significance of ICT in the development of skills, talents, and competencies for successful development, the Federal Republic of Nigeria's National Policy on Education (the Federal Republic of Nigeria, 2018) recommends that it be incorporated into education in Nigeria at all levels. Computers, the internet, television, radio, video conferencing, and mobile learning are all used to integrate (Lubega, 2017). Government and non-governmental organizations, such as banks, as well as individuals, have contributed to the deployment of ICT in Nigerian Tertiary Schools. Firms such as the Nigeria Communications Commission (NCC), Education Trust Funds (ETF), MTN Nigeria, and Zinox Computers, for example, have shared laptops and other ICT gear with instructors and students at higher institutions at various intervals and at different periods. In Nigerian higher institutions, the use of ICT for excellent education is pervasive and ubiquitous.

ICT has been determined to have had a significant impact in upgrading and modernizing the procedures and methods utilized in the management and administration of higher institutions. The majority of administrative and clerical tasks, such as admissions processing, course registration,

fee payment, and academic material procurement, have been computerized and are now completed remotely. Most postsecondary schools offer websites where students may accomplish a variety of tasks on their own and submit them to the university remotely. In Nigeria, the majority of tertiary education institutions are currently using ICTs to handle the majority of their administrative concerns as well as deliver qualitative and quantitative guidance. Previously paid in cash or by bank draft, tuition, lodging, and other charges are now primarily paid online. This means that when ICT is applied at tertiary institutions, administrative services are delivered faster and more effectively, increasing the efficiency and efficacy of the institutions' service delivery.

Researchers efficiently use ICT at tertiary institutions as a source of knowledge and a reliable way of acquiring research materials, which benefits students in their studies by expanding the frontiers of learning beyond traditional classroom studies. ICT has made it possible to collaborate with researchers from various higher institutions throughout the world (Barakabitze et al, 2019). As researchers can readily connect for interaction and comparison of their findings with specialists, ICT has created greater options for research cooperation and networking among scholars all over the world. As a result, national and worldwide dimensions of research topics are being examined. Researchers are consequently confronted with an abundance of data rather than a scarcity of data. As e-mail services, web-based files, data sharing, weblogs, and collaborative workplaces have become the standard, data sharing, peer review, and creating a network of contacts are no longer bound by distance. As a result, information and communication technology has made academic research considerably easier and more engaging among researchers.

ICT has largely replaced old, out-of-date, traditional teaching and learning techniques that do not represent modern reality in university teaching and learning processes. In higher institutions, ICT has revolutionized how education is delivered (Hamilton- Ekeke & Mbachu, 2015). It has prepared the way for a new educational approach in which students are expected to play more active roles in the learning process than previously, i.e., students are more involved and active participants in knowledge generation rather than merely recipients. ICT has also led to the internationalization of higher education by increasing chances for quick information interchange, which has facilitated

teaching, research, and lifelong learning. ICT reduces stress and inspires students and teachers by simplifying complex topics for kids (Barakabitze, et al 2019).

Web-based conferencing, video conferencing, audio conferencing, and open and distance learning are the four ICT media through which learning and teaching activities can take place (Ratheeswari 2018). The live or real-time exchange of audio or voice communications via a network is known as audio conferencing. The telephone and WhatsApp platforms are examples of technologies employed. Pictures or images can be delivered and received over the network using a more advanced version of this media. Audio-graphic is the name given to this sophisticated media. In addition to voice communications and audio conferencing, video conferencing allows users to exchange films or moving pictures. A video conferencing tool like Zoom is a good example. Web-based Conferencing differs in that it lets two or more people to communicate voice messages, images, and videos over the internet using a computer and browser (Bakare, Orji, Wogu & Ogbonna, 2018). During the learning and teaching process, open and distance learning allows for more contact and engagement among individuals. Performing activities based on the tutor's directions, solving issues, and studying at one's own speed can also help with learning.

This study discovered that postsecondary school students now have easy access to learning thanks to the introduction of ICT. For people who are unable to attend school or college due to financial or cultural constraints, distant learning education programs are now widely available. Nigeria, like many other nations, now offers Open Universities that provide students with education via the internet and other forms of communications. Students at open universities have the option of studying with or without teacher supervision. In contrast to traditional teaching approaches, ICT-based learning boosted student involvement (both young and elderly) (Murgor 2015). E-learning and virtual learning were born as a result of ICT. E-Learning is a technique of learning that uses an information technology network, such as the internet, or an intranet (LAN) or extranet (WAN), in whole or in part, for the delivery, interaction, and or facilitation of a study course. Participants can gain information by cooperating in a virtual learning environment. A course curriculum, pre-requisites registration, teacher, and distance learning apps are all part of the ecosystem (Deka & Jena, 2017). Interdisciplinary courses allow students to obtain information and improve their

educational quality at a lower cost (Mikre, 2011). Individual students throughout the world benefit from e-learning systems since they assist in educating and offering training chances on a variety of topics (Mahlangu, 2018). Computer-based learning, virtual classrooms, video conferencing, and digital collaboration are examples of e-learning applications where information is given via the internet, intranet/extranet, audio/videotape, satellite TV, and CD-ROM (Olusanya and Oluwasanya 2014). As a result, pupils have enough learning aids, which improves their access to knowledge resources.

Additionally, the use of ICT in education has enabled online examinations. Exams can now be administered to students online using computers, the internet, and other ICT tools (Dabas, 2018). This strategy has been shown to save time and money while also increasing security and promoting impartiality and justice. In Nigeria, for example, most postsecondary institutions were forced to use online tests during the Covid-19 pandemic and subsequent shutdown. Teachers can now conduct lectures in the classroom through audio or DVD. This also allows students to access these notes whenever they choose, from the comfort of their own homes. With the use of devices like webcams and videoconferencing, ICT has fostered cooperation and partnership between professors and students from all over the world. ICT has also shown to be an effective library tool. Unlike conventional libraries, where actual books are stored and students attend to seek knowledge, ICT has enabled students and even teachers to use libraries from anywhere in the globe at any time.

ICT has aided in the future planning process. Advanced degrees like M.Sc. and Ph.D., necessitate extensive study (both offline and online), and most employment now demand ICT. For example, in the field of accounting, the usage of manual data processing and financial report preparation has become outdated. Financial statements are now prepared with the push of a button using ICT resources such as Sage, Peachtree, and Manager Accounting software. Accountants nowadays, regardless of their degrees, do not have a chance in the employment market unless they are adept in at least one of these tools. Other fields have experienced something similar. Learners are better equipped to accomplish future activities requiring the use of computers when they study using computers and other ICT tools. With the introduction of ICT, hard copy textbooks have become obsolete, whereas digital copy resources have been widely accepted. E-libraries are available

online and may be accessed at any time by anybody from anywhere in the globe. This eliminates all of the rigors and stress of conducting research in a traditional library, which may be intimidating and restrictive. ICT has revolutionized the job of librarians and the purposes of libraries. Given the abundance of learning materials accessible on the Internet, the majority of which are free, librarians are becoming into information managers or cybrarians. Computer professionals and information brokers will be among the cybrarians. (2019, Fomunyan).

ICT has also been critical in promoting high-quality postsecondary education for students with impairments (Martinez, 2011). Learners with special needs and impairments, who were formerly disenfranchised owing to a lack of adequate learning resources, are now fully assisted by ICT. Customized application packages and tutorials have been developed and made available. ICT allowed an atmosphere in which these individuals found it simpler to overcome obstacles in their academic studies and attain their particular educational objectives and ambitions.

Look keys, Qualikey, adapted keyboard: intel keys, virtual keyboard, head/mouth stick keys, and other ICT solutions for a variety of impairments are examples. Frog-pad (keyboard for persons with one hand, 15 keys, with three different level overlays), World of Quails (software for accessing computer without conventional keyboard and mouse), KB foot pedal (Programmable 3 keyboard), (On-screen cursor controlled by basic body movement) Eye-tracking software Software for quail-clicking (Programmable mouse click). A normal USB Webcam catches user movement and software converts it to mouse movement, allowing operation of any program and complete control over the computer/device. Magnification S/W (1.1x to 36x, bulls' eye for aiming, screen split, large print keyboard, change in background colors, inversion of color for persons with negative vision, network based), JAWS (The most popular screen reader worldwide, Braille Embossers (Hardware device used for printing computer generated text in raille format), and JAWS for Windows works with PC to provide audio and visual support for learning), WYNN/Kurzweil 3000 (for persons with dys) (Fomunyan, 2019). Any of these methods will make it simple for any student having special needs to learn with the fewest amount of trouble. These should make educational services for teachers, and learning processes will become faster and smoother as a result.

ICT has evolved into a useful and vital instrument for educational modernization. It empowers students, professors, and specialists to engage and collaborate regardless of their location. Apart from simulating real-world interactions, ICT-supported learning has allowed pupils to collaborate with students from various cultures, hence improving communication skills (Fomunyam, 2019).

### **Impediments to the role of ICT for Quality Education in Nigeria Tertiary Institutions**

Despite the progress made in Nigeria on the impact of ICT on quality education, some factors identified as impediments (Rivers, et al, 2015) include a lack of infrastructure that supports ICT, which has made it nearly impossible to implement these technologies and improve education institutions; limited financial resources, making the establishment and even maintenance of ICT infrastructures difficult; a lack of human and physical resources to support ICT; irregular power supply; high cohesion; and high cohesion.

### **Advantages of ICT Role in Quality Education Nigeria tertiary Institutions** (Talebian et al. (2014):

1. Students can gain 21st-century skills and improve their ICT literacy and competency.
2. Both students and instructors increase their academic performance.
3. Students and instructors are well-prepared for the future, which will be dominated by ICT innovations in an interconnected society.
4. Students can acclimate to the idea of utilizing ICT as a tool for continuous learning and accept it.
5. Flexibility in terms of time and location: Students can attend lectures at their own speed and from any location.
6. Equality: students have equal access to study materials. In terms of the teacher's competency, they have the same access as everyone else.
7. Improved Group Cooperation: It has been demonstrated that online or electronic learning increases student engagement and collaboration.
8. Easy access to extra learning resources: Students have direct access to supplementary content.

9. The increased international character of education: ICT allows students to connect with and share information with students all over the world.
10. Course advancement rates are simple to calculate: The usage of ICT considerably reduces anxiety caused by a fear of failure.

### **Disadvantages of ICT Role in Quality Education Nigeria tertiary Institutions**

Talebian et al. (2014) identified the following as main drawbacks of ICT in the educational system:

1. Unlike traditional face-to-face schooling, there are no teachers.
2. Access to an abundance of information, the majority of which may be false, unproven, or unsupported.
3. Students' assessment, evaluation, and feedback are limited.
4. Inapplicability in practical subjects like engineering, agriculture, and medicine.

### **Conclusion**

Nigeria is progressively adopting and enacting national ICT policy. It is impossible to overestimate the advantages of incorporating ICT into Nigeria's educational system. In this extremely competitive period of globalization, ICT has been recognized to enhance access to current learning methodologies, which improves knowledge. By providing virtual services, ICT plays an important role in Nigerian Tertiary Education, bringing learning closer to students. ICT provides a wealth of learning options for children who may not have access to a classroom. Nigeria's tertiary education system is incorporating ICT. Due to various roadblocks, this is progressing slowly. If the government implements ICT policy and provides appropriate financing for ICT infrastructure, ICT in tertiary education in Nigeria is a possibility. Students will be able to participate significantly to innovation and ground-breaking research thanks to government financing. Finally, national governments must keep an eye on ICT infrastructure at various tertiary institutions to ensure that it is not unused. ICT might become a potent stimulant of excellent education in Nigerian higher institutions with appropriate policy legislation and implementation.

**Based on this conclusion, recommendations are as follows:**

1. Students and staff in higher education institutions should be encouraged to learn how to operate and use ICT equipment and facilities in teaching and learning.
2. The government and players in the Nigerian ICT industry should address the disparities in the distribution of ICT devices in the wider community.
3. The management of Nigerian tertiary institutions should make every effort to provide students with access to accessible internet networks on campus. This will encourage students to use online e-materials to accomplish their tasks.
4. Outdated ICT equipment and facilities should be replaced with contemporary technology and facilities.
5. The government should make an effort to provide money for the procurement of ICT equipment by tertiary institutions. In addition, the management of Nigerian tertiary institutions should work to collect funding from within the country and dedicate a portion of that revenue to ICT education.
6. Management of tertiary institutions should instill a maintenance culture to guarantee that the existing ICT facilities and equipment are always in excellent working order.
7. Staff and students should be regularly educated on how to use the digital library and other ICT tools for research and study.

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