

THE IMPACT OF ICT IN ENHANCING QUALITY EDUCATION IN NIGERIA TERTIARY INSTITUTIONS

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Abstract

Information and Communication Technology (ICT) has made the world to become a global village. Human life has become inseparable from ICT because it covers every aspect including education. In Nigerian tertiary institutions, ICT has registered its presence but the impact has not been fully exhausted. The transition of the world to digital media and information has increased the importance of ICT in education, and this importance will continue to grow and develop in the twenty-first century. ICT an essential component of today's world; it has transformed the educational system by replacing traditional ways of teaching and learning with modern, computer-based processes. This paper highlights the impact of ICT in enhancing quality education in Nigeria tertiary institutions. ICT has undoubtedly impacted the quality and quantity of teaching, learning, and research in Nigeria tertiary institutions. The paper further discussed the benefits of having ICT infrastructure such as e-learning/virtual library, access to quality education for learners with special needs in Nigeria tertiary institutions. The various constraints to ICT utilization should receive prominent attention. The study concludes that government funding of ICT infrastructure, effective policy legislation, and execution and acquisition of appropriate skills are most important for ICT to continue playing its lofty role as a change agent to bring about quality education in Nigerian tertiary institute

Keywords: Education, Electronic learning, ICT, Tertiary institutions, Quality control

Introduction

Quality education refers to education that serves each individual pedagogically and developmentally; an education that is inclusive and is structured to realize the potential of each individual regardless of location or economic status (Adu, Emunenu and Oshati 2014). Arnhold (2021) asserts that quality education is an important and unique goal. The Sustainable Development Goals number four of the United Nations Development Programme, focused purely on education, to ensure inclusive and equitable quality education and promote lifelong learning. Education is defined as the process of acquiring knowledge, skills, values, morals, beliefs, habits, and personal development or facilitating learning (Bello and Johnson, 2011). It is a potent tool for social, economic, and political progress, without which neither an individual nor a society can achieve professional development. It is generally the basis for human development and civilization. Tertiary education is defined by the Federal Republic of Nigeria (2014) as education provided after secondary school in universities, colleges of education, polytechnics, mono technics, and institutions offering correspondence courses. Tertiary education is instrumental in fostering growth, reducing poverty, and boosting shared prosperity. It benefits not just the individual, but the society as a whole and so it is very important. Opportunities are provided for learners to access more advanced and wider areas of learning and develop analytical skills through the adoption of ICT into higher education (Jameel and Ahmad, 2020). ICT is an indispensable part of the contemporary world. It is a force that has changed many aspects of people's ways of life.

The impact of ICT in the past two or three decades in all fields has been enormous. The use of ICT in education as a means of enhancing skills and building capacity for the promotion of

economic development is critical to bringing about viable changes within the education system (Lorente, Arrabal and Pulido-Montes, 2020). Professionals in the fields of education have submitted that ICT holds great promise to improve teaching and learning when properly used, thus bringing about desired quality education.

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 (Adeoye, Oluwole, and Loto2013). 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 local 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 (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 (Terlun 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 (Arnhold, 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 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 (Adeoye, Oluwole, and Loto2013).

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 and 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 and 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, and 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-Abdulganiy and Olaniyi, 2021). Ghavifekr, Kunjappan, Ramasamy, and Anthony (2016) described th 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.

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 and 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 and 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 (Oluasanya 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. (Fomunyan, 2019).

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.

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 (Fomunyan, 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.

Recommendations:

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.

References

- Adeoye, Y.M., Oluwole, A.F., & Loto, A.B. (2013). Appraising the role of information communication technology (ICT) as a change agent for higher education in Nigeria, *International Journal of Educational Administration and Policy Studies*, 5(8), 177-183, DOI: 10.5897/IJEAPS12.027. Available at <http://www.academicjournals.org/IJEAPS>.
- Adu, E O, Emunemu, B. O., & Oshati, T. (2014). The role of information and communication technology (ICT) and higher education in sustainable development. *Journal of oluwa Communication no. 5* (2), 141-192.
- Anikweze, C.M. (2011). Measurement and evaluation. Mimeograph.
- Arnhold, N. (2021). Higher education. Available at [https://www. World Education News nk.org/en/topic/tertiaryeducation#1](https://www.WorldEducationNews.org/en/topic/tertiaryeducation#1). Accessed on Feb 3rd 2022.
- Bakare, J., Orji, C. T., Wogu, J. O. & Ogbonna, C. A. (2018). Effectiveness of teleconferencing in Nigerian universities: A Descriptive Approach. *International Journal of u- and e-Service, Science and Technology*, 11(3), 27-38.
- Barakabitze, A., Lazaro, A., Ainea, N., Mkwizu, H., Maziku, H. Matofali, A., Iddi, A. & Sanga, C. (2019). Transforming African education systems in science, technology, engineering, and mathematics (STEM) using ICTs: Challenges and opportunities. *Education Research International*, [https:// Dghoi.Org/10.1155/2019/6946809](https://Dghoi.Org/10.1155/2019/6946809)
- Bello, S. A. & Johnson, S. (2011). Role of ICT in managing higher education for sustainable development. *Makerere Journal of Higher Education*, 3(1), 10– 20.
- Dabas, N. (2018). Role of computer & information technology in education system. *International Journal of Engineering and Techniques*, 4(1), 570-574.
- Dave, P.A., & Tearle, J. (2010). Impact of ICT based distance learning: The African story. *The Electronic Library* 21 (5),476-486.
- Fomunyan, K. G. (2019). The role of information and communication technology in tertiary education in Africa. *International Journal of Civil Engineering and Technology*, 10(12), 60-69.
- Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and learning with ICT tools: Issues and challenges from teachers' perceptions. *Malaysian Online Journal of Educational Technology*, 4(2) available at. <https://www.mojet.net/>
- Hamilton-Ekeke, J.T & Mbachu, C.E. (2015) The place of information, communication and technology (ICT) in teaching and learning in Nigerian tertiary institution. *American Journal of Educational Research*. 3(3), 340-347
- Jameel, A. S. & Ahmad, A. (2021). The role of information and communication technology on knowledge sharing among the academic staff during COVID-19 Pandemic. <https://www.researchgate.net/publication/351496835>
- Lubega, J.T. (2017). The role of ICT in Africa's evolving higher education sector. Available at www.ruform.Org
- Martinez, R.S. (2011). Disability and the use of ICT in education: Do students with special needs recognise the support given by teachers when using technology. *Problems of education in the 21st Century*, 35(1), 139-158.
- Mathevula, M.D & Uwizeyimana, D.E (2014). The challenges facing the integration of ICT in teaching and learning activities in South African rural secondary schools. *Mediterranean Journal of Social Sciences*. 5(20), 1087-1097
- Mikre, F. (2011). The roles of information communication technologies in education. Review Article with Emphasis to the computer and internet. Available at <https://www.ajol.info>article>view>

- Murgor, T.K. (2015). Challenges facing adoption of information communication technology on african universities. *Journal of Education and Practice*. 6(25). 62-68
- Olusanya, O. and Oluwasanya, A. T. (2014). Information and communication technology (ICT): Catalyst for enhancing the intellectual capacities of educationists and closing observed skill gaps of graduates in higher education in institutions in Nigeria. *American Journal of Engineering Research*. 3(2). 217-229.
- Owoyale-Abdulganiy, I.S. & Ayuba, O.J. (2021). The use of information and communication technology for teaching Islamic studies. amidst of Covid-19 pandemic in Kwara State *International Journal of Management, Social Sciences, Peace and Conflict Studies*, 4(2), 271 - 280;
- Oyebade, S.A., & Dike, C. (2013). Restructuring Nigerian tertiary (University) education for better performance in education in one world: Perspectives from different Nations, Part 4: Higher Education, Lifelong Learning and Social Inclusion 11th Annual International Conference of the Bulgarian Comparative Education Society (BCES) ijob
- Pius, M. I., & Aiii, M. (2019) Nigeria's vision 20:2020 and quality education in Nigeria: Implications for sustainable development. *BSUJEM I(2)*, available at <https://www.bsum.edu.ng/journals/files/jem/vol1n2/article8.pdf> Accessed on Feb 3rd 2022.
- Ratheeswari, K. (2018). Information communication technology in education. *Journal of Applied and Advanced Research*, 3(1), S45-S47.
- Rivers, P. A., Rivers, J. K., & Hazell, V. (2015). Africa and technology in higher education: Trends, challenges, and promise. *International Journal of Innovation Education and Research*, 3(5), 14-31
- Talebian, S., Mohammadia, H. M., & Rezvanfar, A. (2014). Information and communication technology (ICT) in higher education: advantages, disadvantages, conveniences and limitations of applying e-learning to agricultural students in Iran. *Procedia - Social and Behavioral Sciences*, 152, 300-305.
- Terlumun Mark, J. T., & Nguzan, W. R. (2019). Impact of information and communication technology on tertiary institutions, *BSUJEM Vol. I(2)*.
- UNDP (2022). Goal 4: Quality Education, <https://www.ng.undp.org/content/nigeria/en/home/sustainable-development-goals/goal-4-quality-education.html>. Accessed on Feb 3rd 2022.
- WES (2017). Education in Nigeria, available at <https://wenr.wes.org/2017/03/education-in-nigeria>. Accessed on Feb 3rd 2022.