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BOOK CHAPTER

PERSPECTIVE ON TERTIARY EDUCATION IN NIGERIA

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Acknowledgments

CONTRIBUTING AUTHORS

Ogunode Niyi Jacob, PhD
Department of Educational Management, Faculty of Education, University of Abuja
niyijacoogunodejacob@gmail.com
O7030108329

Eze, Ifeoma Nonyelum
Department of Educational Management, Faculty of Education, University of Abuja, Nigeria, Nigeria.
ifeomanonyelumeze@gmail.com

Dr. Ayodele Ebunolu Nwisagbo
Department of Educational Management, Faculty of Education, Rivers State University, Port Harcourt, Nigeria.
ebunolu.nwisagbo@rsu.edu.ng
ORCID: https://orcid.org/0009-0006-4395-8739

Conrad Ugochukwu Ukozor., Ph.D.
Department of Educational Management, University of Abuja, Nigeria
conradorare@gmail.com

Olowonefa Jethro Abiodun, Ph.D
Educational Management, Faculty of Education, University of Abuja, Nigeria. ayodeleolowo1965@mail.com

Victor Olugbenga Ayoko
Department of Educational Foundations, Faculty of Education, National Open University of Nigeria.
victorayoko@gmail.com

Nuhu Ummul Qulsum, PhD
Department of General Studies, Faculty of Education, Abdulkadir Kure University, Minna, Niger State, Nigeria.

Dr.Imoukhuede O G
Proprietor & CEO (Ambassador Global Academy, kwali Abuja).

Adebayo Adeniyi Daniels
Department of Environmental Science, Federal Polytechnic, Ugep, Cross River State, Nigeria.
adebayodaniels@fedpolyugep.edu.ng

Dr. Afolabi Iyabode Omolola
nicelolly68@gmail.com
Department of Educational Management, Faculty of Education, University of Abuja, Nigeria

Esther Amina Akuh, PhD
Department of Educational Foundations, Federal University Lokoja, Nigeria. estheraminaakuhq2@gmail.com
Orcid ID:0009-0002-3381-8688

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CHAPTER SIX

INFORMATION COMMUNICATION DEPLOYMENT IN TERTIARY EDUCATION

By

Victor Olugbenga Ayoko

Department of Educational Foundations, Faculty of Education, National Open University of Nigeria.

Email: victorayoko@gmail.com

ABSTRACT

The integration of Information and Communication Technologies (ICTs) in tertiary education has transformed teaching, research, administration, and community service, making it a vital component of 21st-century higher education. ICT facilitates access to vast learning resources, enhances collaboration, and streamlines institutional processes. This chapter explores the deployment of ICT in Nigerian tertiary institutions, with emphasis on its application in teaching, research, and community service. The chapter begins with a clarification of key concepts, including tertiary education and ICT, and proceeds to highlight the imperative of ICT integration in higher education. The discussion underscores how ICT has enhanced teaching effectiveness, supported innovative pedagogical practices, and enabled inclusive learning for students with diverse needs. It also examines the role of ICT in advancing research through digital databases, virtual collaboration, and knowledge sharing. Furthermore, the chapter addresses the use of ICT in community service, where it improves project management, outreach, and data analysis for sustainable community development. Finally, the advantages of ICT integration—such as improved digital literacy, enhanced collaboration, cost reduction, and workforce readiness—are presented. The chapter concludes that ICT is indispensable for achieving the goals of tertiary education in Nigeria and globally. Its sustained integration into higher education curricula is essential for equipping graduates with the skills needed for the digital economy and for promoting national development.

Keywords: ICT, Tertiary Education, Teaching, Research, Community Service, Nigeria

Introduction

The use of Information and Communication Technology (ICT) in tertiary institutions has become an integral component of the academic landscape. Incorporating ICT in higher education offers numerous benefits, ranging from enhancing teaching and learning to improving research and streamlining administrative processes (Ogunode, Olatunde-Aiyedun, Ukozor, & Ayeni, 2024). ICT has revolutionized access to knowledge through digital platforms and tools, enabling students and faculty to utilize e-books, journals, research databases, and online learning platforms. This not only saves time but also enriches learning by providing up-to-date and relevant information.

ICT has significantly improved communication and collaboration among students, teachers, and administrators. Through the use of online platforms, such as video conferencing, discussion forums, and messaging apps, learners can interact with their peers and instructors beyond the confines of the classroom. This promotes a more dynamic and inclusive learning environment, where students can engage in meaningful discussions and exchange ideas with a wider community. ICT has been instrumental in enhancing the efficiency and effectiveness of administrative processes in tertiary institutions. Tasks such as course registration, fee payments, and grade management can now be done electronically, saving time and resources for both students and staff. This also reduces the likelihood of errors and delays, promoting a more streamlined and organized academic system.

ICT is becoming more and more essential to our educational system, and as a result, there is an increasing need for academic staff to use technology to gain the expertise and knowledge necessary for 21st-century pedagogy. Recognizing the value of ICT, educational institution management, the government, nongovernmental organizations, etc. occasionally work together to restructure the lecturers' flair in order to close the technology gap in their abilities (Van Dike & Klooster, 2015). In other words, as information and technology advance, student learning outcomes improve, knowledge transfer quickens, the scientific research revolution gets going, and more information and knowledge are produced. The terms "information technology and communication" refer to the corresponding electronic and communication tools. The benefit of this tool is that it promotes the effective use of contemporary instructional materials in teaching and learning, allowing for the creation and completion of teaching workloads prior to the end of the semester or session. These ICT facilities cover a wide range of topics for global transformation, including technology, socialization, politics, economics, and education (UNESCO, 2007).

This chapter is organized under the following subheadings:

1. Clarification of concepts

   o Tertiary Education

   o Information Communication Technologies

2. The Imperative of ICT Integration in Tertiary Education

   o Teaching

   o Research

   o Community Service

3. Advantages of Integrating ICT in the Tertiary Education Curriculum

Clarification of concepts

Tertiary education

The word tertiary simply means of the third rank or order, and tertiary= level of education in Nigeria, based on the aforementioned meaning, implies that tertiary education in Nigeria is the third order of education which can also be referred to as higher education (Okai, & Botimi –Slaboh 2019). Tertiary education is a front liner amongst the tiers of education and is considered the icon for national development and transformation, implying that every skill, knowledge and information gained through this means is the vehicle for productivity, wealth creation, prosperity, good health and healthy living, competitiveness, communication, expansion, scientific and technological advancement (Ofojebe & Chukwuma, 2015). Tertiary education is synonymous with higher education in Nigeria. This is the aspect of education that is in charge of producing the output required by society for national development (Okai, et al 2019). Tertiary education fosters individual development and growth as well as impacts positively on the society at large (Schrader-King, 2024).

After completing elementary and high school, a person can pursue tertiary education. It could take place in an educational institution, polytechnic, or university. In post-secondary education or tertiary education, students specialize in their primary field of study, which may include the arts, sciences, or a vocational field (Johnstone, Arora & Experton, in Ogunode, 2020). Ibrahim (2017) stated that higher institutions are very important tools in meeting the socio-cultural and developmental needs of a country. Tertiary education was defined Federal Republic of Nigeria in her national Policy on Education (2013) as the education given after Post Basic Education in institutions such as Universities and Inter-University Centres such as the Nigeria French Language Village, Nigeria Arabic Language Village, National Institute of Nigerian Languages, institutions such as Innovation Enterprise Institutions (IEIs), and Colleges of Education, Monotechnics, Polytechnics, and other specialized institutions such as Colleges of Agriculture, Schools of Health and Technology and the National Teachers' Institutes (NTI) (FRN, 2013).

The goals on higher education in Nigeria Education according to the National Policy on Education (NPE) are to: Contribute to national development through high level manpower training; provide

accessible and affordable quality learning opportunities in formal and informal education in response to the needs and interests of all Nigerians; provide high quality career counseling and lifelong learning programmes that prepare students with the knowledge and skills for self-reliance and the world of work; reduce skill shortages through the production of skilled manpower relevant to the needs of the labour market; promote and encourage scholarship, entrepreneurship and community service; forge and cement national unity; and promote national and international understanding and interaction (FRN, 2013). The goal of tertiary education is to prepare students for the workforce by exposing them to pertinent practical experience and appropriate theoretical knowledge. The goal of tertiary education is to prepare students for the demands of the profession while also ensuring that all the resources needed for successful training and experience are accessible (Olatunde-Aiyedun, 2024).

Information Communication Technologies

ICT is defined by the United Nations Educational, Scientific, and Cultural Organization (2007) as any technology used for the creation, storing, sharing, transmitting, or exchanging of information. The notion was established to encompass technologies like radio, television, video, DVD, telephone, and network hardware and software, along with related services like electronic mail and video conferencing. ICT is a more general term that emphasizes the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), intelligent building management systems, and audio-visual systems in modern information technology. It is frequently used as an extended synonym for information technology (IT). ICT includes all technological tools, including network and computer hardware, communication middleware, and required software, that are used to manage information and facilitate communication. Stated differently, ICT includes broadcast media, telephony, IT, all forms of audio and video processing and transmission, and network-based control and monitoring.

Information and Communication Technology (ICT) can be referred to as the integrated use of electronic tools and systems, including computers, telecommunications, and media technologies, that facilitate the collection, storage, processing, transmission, and sharing of information. In educational settings, ICT encompasses a wide range of hardware, software, and networks that support various activities such as teaching, learning, administration, and research. These technologies enable users to access and manipulate data, enhance communication, and streamline processes, ultimately transforming the way information is delivered and received within institutions. ICT plays a vital role in modern education by improving access to knowledge, fostering collaboration, and promoting innovative learning experiences (Ogunode, Olatunde-Aiyedun, Ukozor, & Ayeni 2024).

ICT resources are also defined by the World Bank (2002) as the hardware, software, networks, and media used for information gathering, processing, storing, transmitting, and presenting (speech, data, text, and images) as well as associated services. ICT can be broken down into two parts:

information technology (IT), which refers to the hardware and software used for information gathering, storing, processing, and presenting data, and information and communication infrastructure (ICI), which refers to actual telecommunications systems and networks (cellular, broadcast, cable, satellite, postal), as well as the services that use them (Internet, voice, mail, radio, and television). The hardware tools and software applications used in the process of delivering instruction toward high-quality teaching and learning.

The term, information and communication technologies (ICT) refers to a broad range of technological resources and tools that are used to create, transmit, store, share, and exchange information. ICT permeates every aspect of life, offering people new, improved, and quicker ways to connect, network, ask for assistance, and access information. Information technology is therefore thought to be concerned with the gathering, handling, organising, and dissemination of information, whether it be textual, numerical, photographic, or verbal. In other words, the term is used broadly to refer to the collection, organisation, storage, and retrieval of information, whether it be in the form of text, numbers, voices, photographs, audio, video, or an integration of any or all of these, which is best referred to as multimedia, using a combination of computer and telecommunication tools (Edo, & Egwurugwu, 2023).

The Imperative of Information Communication Technologies Integration in Tertiary Education

Teaching

Teaching programme is one of the most important programmes of the tertiary institutions. Teaching programme is one of the indicators used to measure the standard of tertiary institutions. Teaching is a process in whereby professional individual carry out instruction to the students with the aims of modifying their behaviors. Teaching is a systematic act that involves imparting instructions to the learners in the classroom situation either in basic school, secondary school and tertiary institutions (Ogunode & Ndayebom, 2023). *Teaching* programme is an organized process of attending providing services to the learners. *Teaching* programme is the act the giving instruction in a basic school or a secondary school or in a university. Teaching programme constitutes the teachers, students and teaching and learning resources. The teachers' qualifications, experiences and leadership skills matters in the implementation of teaching programme (Ehichoya, & Ogunode 2020). The implementation of teaching programme in the schools can be done both online and off-line.

The use of ICT in supporting teaching has become increasingly prevalent in tertiary education curriculum. This is due to the ever-evolving nature of technology and its impact on the education sector. ICT, or information and communication technology, has greatly enhanced the learning experience for students by providing access to a wide range of resources, tools, and platforms. Through the use of technology, students are able to access a vast amount of information, collaborate with their peers, and engage in interactive learning activities. This has greatly improved

the quality and efficiency of teaching in tertiary education curriculum. ICT has enabled educators to create and deliver engaging and interactive lesson plans, making the learning process more enjoyable for students. With the rapid advancements in technology, the use of ICT is only expected to continue to increase in education, providing students with a diverse and enriching learning experience.

This is because ICT provide greater opportunity for educators, teachers and students to adjust learning and teaching to current educational needs or policies. Thus schools are indubitably compelled to give appropriate response to this technical innovation in order to remain relevant in the society (Fisseha 2011). Kpolovie, 2010a and Tomie, (2014) noted that ICT has disentangled the problem of the task of the university and polytechnic lecturers with the current state of severe shortage of academic facility and staff facing our tertiary institutions. ICT could be leveraged through video conferencing so that students on various campuses pursuing the same or similar academic programs could be connected at the same time to benefit from a lesson which they lack lecturers. The ICT is use to provide the administrative functions and management functions in the university system which include teaching,

For the academic staff, Information and Communication Technologies is use for preparation of lesson plan, preparation of note, e-researching, security services, health services, financial services, counselling services, maintaining services and academic services. marking, e-evaluation, e-supervision and e-feedback. The lecturers in tertiary institutions use ICT for: teaching and research with additional administrative assignments. ICT adoption has the potentials of lessening the administrative duties. In teaching and learning in a university system, information and communication technologies offer numerous opportunities in the higher educational system (Kpolovie, 2010a; 2016).

The use of ICT in learning is mediated by availability and accessibility to ICT facilities without which the use is impossible. ICT allows students to monitor and manage their own learning, think critically and creatively, solve simulated real-world problems, work collaboratively, engage in ethical decision-making, and adopt a global perspective towards issues and ideas (Ra, 2016; Aboki, Apuru, & Lakan, 2022). ICT also enables rapid access to ideas and experiences from a wide range of people, communities, and cultures, and allows students to collaborate and exchange information on a wide scale. ICT in education improves engagement and knowledge retention: When ICT is integrated into lessons, students become more engaged in their work.

This is because technology provides different opportunities to make it more fun and enjoyable in terms of teaching the same things in different ways (ICTESOLUTIONS, 2022; Aboki, et al 2022). ICT is used to retrieve information, make research, disseminate information, chat with friends and download files, among others (Agim, Iroeze & Osuji, 2018; Aboki, et al 2022). Joe, (2019) also asserted ICT enables the use of innovative educational resources and the revitalization of learning methods, starting a more active teamwork of students and the concurrently gaining of

technological knowledge. Furthermore, ICTs enable students to develop discernment skills; being able to search for various sources and contrast them, as well as structure information.

Furthermore, with an increasing number of students with disabilities in higher institutions of learning, integrating information and communication technologies (ICTs) in the educational system will be helpful for these students, as ICTs provide them students with adaptive ways to compensate for disabilities and enable them to improve learning (Aboki, et al 2022).

Research

Research can simply be defined as the process of arriving at dependable solutions to problems through planned and systematic collection, analysis and interpretation of data. Research is an important tool for advancing knowledge promoting progress, and enabling scholars to relate more effectively to the environment, to accomplish their objectives, and to resolve conflicts (National Open University 2020). The research programme is one of the major programmes of the universities. It is a key to the university's development. The research programme of the universities is one of the key indicators used to measure the performance of the universities. The three cardinal programmes of the universities are teaching programme, research programme and community services. The research programme is the second cardinal programme of the universities. It is among the criteria used for measuring the performance of the universities. The research programme of the universities aims to aid the social, economic and technological advancement of the country. Worthwhile research findings transform society positively and also improve the overall quality of life. Without research, old knowledge will only be recycled and at a point will become anachronistic. Research work must show the novelty of ideas and not repetitive but repetitive to have an impact on the life of the society. The variety of results that come from the research will expose facts, provide evidence, discover the unknown and ultimately, expand the frontier of knowledge in the different areas of studies (Ohaeri, Olayinka & Ogunode, 2023; Paul, 2015).

The implementation of information and communication technology (ICT) has greatly supported research in tertiary education curriculum. With the increasing use of ICT in educational settings, students and educators are able to access a wide range of digital resources and tools, making the learning process more efficient and effective. This has also opened up opportunities for academic institutions to collaborate and share research findings through digital platforms. ICT has supported research in tertiary education curriculum is through the use of digital databases. These databases contain a vast amount of scholarly resources and information, making it easier for students and researchers to search and access relevant materials for their research. This not only saves time and effort, but also ensures that the information gathered is reliable and up-to-date.

ICT has allowed for the creation of online learning platforms, such as virtual classrooms and digital course materials. These platforms provide students with the opportunity to engage in interactive

and collaborative learning, enhancing their research skills and critical thinking abilities. This also allows for a more personalized learning experience, as students can access materials and resources at their own pace and convenience. The use of ICT in tertiary education curriculum has also facilitated communication and collaboration among researchers, both within and across institutions. Through online forums, video conferencing and virtual meetings, researchers can easily connect and exchange ideas, leading to more comprehensive and diverse research projects.

ICT has played a crucial role in supporting research in tertiary education curriculum. Its integration in academic settings has opened up new avenues for learning and collaboration, ultimately contributing to the advancement of knowledge and understanding in various fields of study (Ogunode, Abubakar, Abashi, Ireogbu, Longdet 2021; Ogunode, Okwelogu, &Olatunde-Aiyedun, 2021).

Community Service

Community service programme of tertiary institutions are social and economic projects that are designed to serve community purposely in the fields such as health, social service, environmental protection, education, urban and rural redevelopment, welfare, recreation, public facilities, public safety, and child care. Community service programmes are organized projects, supervised activities that are a direct benefit to the community and are designed to improve the welfares of the whole communities (Lawinside, 2024). Community service programme refer to structured programm undertakes to improve the social, economic of host communities. Communities service programme are geared towards solving community problems. Community service programme are designed to promote positive development in the communities and improve social changes. Community service programme is the third cardinal programme of the tertiary institutions. Community service programme is an organized and planned service programme of higher institutions for the benefit and betterment of their host community. Community service programme of higher institutions are community inclined services initiated by the institutions to develop the communities. Community services of higher institution are services provided by institutions to benefits the community people (Ogunode, Iyabode & Olatunde-Aiyedun, 2022).

In recent years, there has been an increasing emphasis on the role of tertiary institutions in promoting community service and engagement. With the rapid advancement of information and communication technology (ICT), tertiary institutions have been utilizing various digital tools to facilitate and improve their community service efforts. These tools have proven to be invaluable in streamlining processes, increasing efficiency, and enhancing overall impact (Ogunode, Babayo, Jegede & Abubakar 2021).

One area where ICT has particularly aided in the provision of community service in universities is through the use of online platforms. These platforms allow for easy coordination, communication, and collaboration between university students, faculty, and community organizations. They also provide a centralized location for storing and sharing relevant information, such as project details,

timelines, and progress updates.ICT has enabled universities to expand their community service reach beyond their physical location. With the use of online tools, universities can now connect with and engage with communities in remote or underserved areas. This has not only enriched the academic experience for students but also increased the impact and reach of community service projects.

ICT has also facilitated the collection and analysis of data related to community service efforts in universities. By utilizing digital tools, universities can efficiently gather and analyze data on their projects, such as the number of participants, resources utilized, and impact on the community. This data can then be used to inform future community service initiatives and improve their overall effectiveness. The use of ICT has greatly aided in the provision of community service in universities. It has enabled universities to better organize, expand, and evaluate their community service efforts, ultimately leading to a more impactful and meaningful experience for both students and the communities they serve.

The use of information and communication technology (ICT) has greatly contributed to the provision of community service by lecturers in tertiary education curriculum. By utilizing ICT, lecturers are able to connect with community members, share resources and knowledge, and facilitate meaningful collaborations. This technology has also enabled lecturers to easily access and disseminate information about community needs, leading to more effective and targeted community service projects (Ogunode, Hammadu, Ahmed, & Ojo, 2021;Ogunode, Adamu & Ajape 2021).

ICT tools such as online platforms and virtual classrooms have helped lecturers to reach and engage with a larger audience, breaking down geographical barriers and increasing the impact of their community service efforts. ICT has revolutionized the way lecturers can support and engage in community service, resulting in a more collaborative and impactful approach to community service in tertiary education.

Advantages of Integrating Information Communication Technologies in tertiary education Curriculum

- Integrating Information Communication Technologies (ICTs) into a tertiary education curriculum offers numerous benefits. Firstly, it enhances students' digital literacy skills, allowing them to acquire necessary skills for the modern workforce. It provides students with access to a wide range of information and resources, thus improving their learning experience.
- Furthermore, incorporating ICTs can foster collaboration and communication among students and instructors, leading to a more engaging and interactive learning environment. It also enables personalized learning, as students can access materials at their own pace and in their preferred format.
- Moreover, integrating ICTs can reduce the cost of education, as it eliminates the need for traditional textbooks and physical classrooms. Lastly, it prepares students for the digital-driven

world, equipping them with the necessary skills and knowledge to excel in a technology-driven society.

Summary

In summary, the benefits of ICT in tertiary institutions are numerous and undeniable. It has transformed the academic landscape, providing unlimited opportunities for access, communication, efficiency, and innovation. As technology continues to evolve, the potential for ICT to further enhance higher education is exciting and promising.

The integration of ICT has allowed for the development of innovative teaching methods and tools. The use of educational software, simulations, and virtual reality has made learning more interactive and engaging, catering to diverse learning styles and needs of students. This not only enhances the quality of education but also prepares learners for the ever-evolving digital landscape.

ICT is indispensable to tertiary education, providing transformative opportunities for teaching, research, administration, and community service. Its adoption has improved efficiency, inclusivity, and innovation, thereby positioning higher education as a driver of national and global development. Sustained investment in ICT facilities and staff training is essential for maximizing its benefits in tertiary institutions.

Review Questions

1. What do you understand by Tertiary education?

2. What is Information Communication Technologies?

3. Discuss three imperatives of Information Communication Technologies Integration in Tertiary Education using:

a) Teaching

b) Research

c) Community Service

4. List five advantages of Integrating Information Communication Technologies in tertiary education Curriculum

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