



Effect of Information and Communication Technology on Curriculum Delivery in Tertiary Institutions in Nigeria



Salako Oluwaseun Adewale*

Department of Public Administration The Federal Polytechnic Ilaro, Ogun-State Nigeria

Email: oluwaseun.salako@federalpolyilaro.edu.ng



Sodeinde Victor Oluwaseyi

Department of Computer Science The Federal Polytechnic Ilaro, Ogun-State Nigeria

Email: victor.sodeinde@federalpolyilaro.edu.ng

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Abstract

The impact of information and communication technology (ICT) on the delivery of curricula in Nigerian tertiary institutions is thoroughly examined in this article. Technology's fast evolution has made it more common for educational settings to use ICT technologies, which presents both many opportunities and difficulties for developing and delivering curricula. This study used a systematic Literature review as part of its research approach, which also included pertinent reports, academic publications, research papers, and a structured questionnaire. According to the findings, ICT has had a substantial impact on how the curriculum is delivered at tertiary institutions in Nigeria, leading to noticeable changes in teaching strategies, student learning environments, and educational outcomes as a whole, but has certain challenges like poor infrastructural development, low level of literacy among others, however, the study recommended that Tertiary institutions in Nigeria should embrace ICT in curriculum delivery, the government should fund ICT education facilities in Nigerian Tertiary institutions.

Keywords: Information and communication technology; Curriculum; Learning; Education.

1. Introduction

Information and Communication Technology (ICT) has revolutionized various aspects of society, including education. In tertiary institutions in Nigeria, the integration of ICT in curriculum delivery holds tremendous potential to enhance teaching and learning processes, improve student engagement, and equip graduates with essential digital skills. The world has become a global village in which the use of ICT is now imperative in all sects of human life and this is not peculiar to economy, finance, culture, politics and international relations but also including education (Adedoja, 2019). The application of new technological development into curriculum delivery in Nigerian educational sector is now a global practice which can make Nigerian students to be at par with contemporaries across the globe.

Application of Technology has aided in the removal of geographical, linguistic, and cultural barriers, allowing students to learn more effectively and efficiently, which is reflected in institutional programs such as Open and Distance Learning, online courses among others which were part of the obstacles to teaching and learning associated with limited admission capacity of Nigerian tertiary institutions. The outbreak of COVID-19 opened up an insight by institutions to adopt ICT to cushion the effect of the virus by not keeping the student idle. The use of information and communication technology (ICT) was essential in enhancing curriculum delivery in Nigeria during the COVID-19 epidemic. Since schools had to be shuttered to stop the virus's transmission, a variety of ICT tools had to be used to maintain education.

The introduction of ICT in curriculum delivery is of utmost importance in the Nigerian tertiary education system. Nigeria, being one of the largest and most populous countries in Africa, faces numerous challenges in its

education sector. The adoption of ICT has the potential to address some of these challenges by promoting innovative teaching methodologies, increasing access to educational resources, and fostering a learner-centered approach.

2. Objectives of the Study

The central objectives of this research are as follows:

1. To assess the current state of ICT integration into curriculum delivery in Nigerian tertiary institutions.
2. To examine the specific effects of ICT on curriculum delivery processes in the Nigerian tertiary education system.
3. To identify the challenges and barriers hindering the effective utilization of ICT in curriculum delivery in Nigerian Tertiary Institutions.

3. Review of Extant Literatures

Information and communication technology (ICT) is defined as "all hardware, software, networking, and media for the collection, archiving, processing, transmission, and presentation of information (voice, data, text, images, video, and multimedia), as well as related services that enable users to access, retrieve, manipulate, and communicate information." (Kharchenko *et al.*, 2019).

Curriculum delivery on the other hand refers to the methods, strategies, and processes adopted to deliver educational content, enhance learning experiences, and dishing out instructional materials to students. It involves the implementation of the educational curriculum, including the selection and sequencing of instructional activities, continuous assessment methods, and the use of various teaching resources to stimulate learning (Ololube *et al.*, 2017).

Information and Communication Technology (ICT) has a great influence on modern work practices on academic practice including curriculum delivery, in tertiary institutions in Nigeria. The outbreak of COVID-19 really encouraged the adoption of ICT in academic activities in Nigeria, though earlier than this outbreak, some Tertiary Institutions has been operating a real time activity such as online Purchase of Form and registration, online curriculum delivery. Other areas of influence include:

1. **Enhanced Teaching and Learning:** The use of Information and Communication Technology resources like computers, projectors, interactive whiteboards, and educational software has completely changed how we teach and learn. Multimedia resources can help lecturers give lectures more successfully, involving students more fully in the learning process.
2. **Blended Learning:** The use of blended learning strategies, which combine conventional face-to-face education with online components, has been made easier by ICT. Universities and other postsecondary institutions provide flexibility to both lecturers and students by providing some or all of their courses online. This method encourages self-paced learning by enabling students to access course materials, take part in conversations, and complete assignments online.
3. **Collaboration and communication:** Students, instructors, and administrators can effectively communicate and collaborate when using ICT technologies like email, instant messaging, and video conferencing. Even when participants are physically separated, conversations, group projects, and virtual meetings are made possible through online platforms and learning management systems. This encourages collaboration and knowledge exchange.
4. **Assessment and Evaluation:** In tertiary institutions, ICT has expedited the assessment and evaluation process. Automatic grading of online examinations, quizzes, and assignments can save lecturers' time and provide students immediate feedback. Online testing tools can also make it easier to identify plagiarism, protecting academic integrity.
5. **Administrative Effectiveness:** ICT has enhanced tertiary institutions' administrative procedures. Today, it is possible to do tasks like enrollment, registration, and fee payment online, which eliminates paperwork and lengthy lines. ICT systems may be used by administrative employees for data analysis, reporting, and record keeping, increasing overall efficiency.

In order to improve teaching and learning, Information and Communication Technology (ICT) is being increasingly included into Nigerian curriculum. Here are some specific instances of ICT applications utilized to deliver education in Nigeria.

Some specific examples of ICT applications used in curriculum delivery in Nigeria:

1. **Online learning platforms:** To offer curriculum content, schools and educational institutions in Nigeria used online learning platforms including Learning Management Systems (LMS) and virtual classrooms. These systems enabled lecturers to exchange assignments, conduct live or recorded video sessions, submit lesson materials, and communicate with students from a distance
2. **Educational Websites and Portals:** Access to curricular resources is made possible through the development and use of educational websites and portals by a number of organizations and educational institutions. These online platforms provided students with remote access to digital textbooks, lecture notes, instructional videos, and interactive tools through computers or cellphones.
3. **Virtual labs and simulations:** Students can conduct experiments and explore scientific ideas in a virtual setting using virtual labs and simulations. With the use of these instruments, students can practice and put their theoretical knowledge into practice.

- 4. Computer-Assisted Instruction (CAI):** Using educational software and computer programs to provide curriculum material and offer individualized learning experiences is known as computer-assisted instruction. These applications can track progress, adjust to each student's needs, and give rapid feedback.
- 5. Collaborative tools and online discussion boards:** These resources encourage student participation and communication outside of the traditional classroom setting. Students can participate in discussions, exchange ideas, work together on projects, and give each other feedback on these platforms.

The effect of ICT on curriculum delivery in tertiary institutions in Nigeria has been significant and transformative. Here are some key effects of ICT on curriculum delivery:

- 1. Access to Information and Resources:** ICT tools and gadget such as computers, the internet, apps and digital libraries, enables students and educators to have easy access to a wealth of information and educational resources. Access to ICT resources enables the student expand beyond traditional methods of textbooks, journals and classroom materials, it equally encourages students to explore divergent perspectives and be up to date with current knowledge (Aduwa-Ogiegbaen and Iyamu, 2005).
- 2. Enhancing Teaching and Learning:** ICT tools offer interactive and multimedia learning experiences, making curriculum delivery more engaging and effective. Lecturers can use multimedia resources, online platforms, and educational software to present complex concepts, demonstrate experiments, and engage students through interactive activities (Ogunleye and Akinsolu, 2017).
- 3. Personalized Learning:** ICT enables personalized learning experiences by accommodating individual students' learning styles and pace. Learning management systems and online platforms allow for adaptive learning, where students can progress at their own speed, receive immediate feedback, and access customized resources tailored to their specific needs (Ajayi and Ojo, 2017).
- 4. Collaborative Learning:** ICT tools facilitate collaborative learning among students and educators. Online discussion forums, video conferencing, and shared online workspaces promote collaboration, knowledge sharing, and peer-to-peer learning beyond physical classroom boundaries (Obanya *et al.*, 2017).
- 5. Flexibility and Accessibility:** ICT offers flexible learning opportunities that are not bound by time or location. E-learning platforms and online course materials enable students to access educational content at their convenience, supporting lifelong learning and enabling individuals who may face geographical or physical limitations to pursue higher education (Gbenu, 2018).
- 6. Skills Development:** Integration of ICT in curriculum delivery helps students develop essential digital literacy and 21st-century skills. Through working with various ICT tools and applications, students gain technical skills, information literacy, critical thinking, problem-solving abilities, and effective communication skills (Oladipo and Adewale, 2017).

By improving learning experiences, increasing collaboration, extending access to information, and fostering the development of important skills, the use of ICT in curriculum delivery has the potential to completely transform education. To fully utilize ICT in Nigerian tertiary institutions, it is crucial to solve issues with infrastructure, the digital divide, and teacher training.

4. Shortcoming/Challenges of ICT on Curriculum Delivery in Tertiary Institutions in Nigeria

However, it is important to note that not all tertiary institutions in Nigeria have equal access to ICT infrastructure and resources. There may be disparities in terms of internet connectivity, computer availability, and ICT training among institutions. Efforts should be made to bridge these gaps and ensure equitable access to ICT tools and resources for all tertiary institutions in Nigeria. The contributions of Information and Communication Technology (ICT) to curriculum delivery in tertiary institutions in Nigeria cannot be over-emphasized, but there are also some shortcomings or loopholes associated with the use of Technology in academics. Some of these shortcoming include;

- 1. Infrastructure and Connectivity:** In Nigeria, there is Limited access to reliable and high-speed internet connectivity and this is one of the major challenges in many parts of Nigeria. Inadequate ICT infrastructure, as well as inadequate computer facilities and power supply, can hinder effective implementation of ICT-based curriculum delivery (Ajelabi, 2017; Oladiran, 2016).
- 2. Digital Divide:** There is prevalence of digital divide in Nigeria, as a result of disparities in the rate of access to ICT tools, infrastructure and resources among different institutions and states. Institutions that are not in the urban or cities areas may face difficulties in obtaining necessary ICT infrastructure and this would result to an unequal learning environment. (Ogunbodede and Jegede, 2011).
- 3. Inadequate Technical Skills and Training:** Lecturers and staff sometimes lack the necessary technical know-how and training to effectively apply ICT into their teaching practices. Inadequate training opportunities and limited ICT literacy among educators usually hinder the adoption, application and successful implementation of technology-based curriculum delivery in Nigeria. (Nkadi, 2015; Osang and Njoku, 2018).
- 4. Availability of Quality Content:** Despite the abundance of internet resources, it might be difficult to guarantee their quality, correctness, and relevancy. The efficiency of ICT-enabled curriculum delivery may be hampered by the lack of current, locally relevant educational resources that are in line with the Nigerian curriculum. (Adedoja, 2019; Oladiran, 2016).
- 5. Funding Constraints:** Limited financial resources allocated to ICT initiatives in the public sector hinder their implementation and sustainability. Insufficient funding for ICT infrastructure, equipment, software, and maintenance restricts the potential for ICT-driven improvements in service delivery (Olatokun and Ayo, 2019).

6. *Policy and Regulatory Framework*: The absence of comprehensive ICT policies and clear regulatory frameworks can impede the effective integration of ICT in the Nigerian tertiary institutions. The lack of harmonized policies, standards, and regulations may result in inconsistencies, duplication of efforts, and limited coordination among government agencies (Idike and Amaeshi, 2019).

5. Addressing the Challenges of ICT in Curriculum Delivery in Nigerian Tertiary Institutions

Addressing the challenges of ICT in the Nigerian public sector requires a comprehensive approach that involves various stakeholders. Here are some strategies to overcome the challenges and maximize the benefits of ICT:

1. **Infrastructure Development**: The government at all levels should prioritize investments in ICT infrastructure by expanding internet connectivity, improving power supply, and strengthening telecommunications networks. Partnering with private sector can also help to bridge the infrastructure gap and extend ICT services to underserved areas.
2. **Bridging the Digital Divide**: By fostering digital literacy and granting underprivileged communities and rural areas access to ICT resources, efforts should be made to close the digital gap. The creation of community ICT centers, the funding of ICT equipment, training programs, and other initiatives can assist guarantee fair access to technology.
3. **ICT Capacity Building**: It is crucial to improve the ICT abilities and understanding of public sector personnel. To increase digital literacy, ICT competency, and awareness of emerging technologies, training programs, workshops, and certification courses should be made available. Initiatives for increasing capacity can be facilitated through cooperation with academic institutions, training facilities, and industry professionals.
4. **Adequate Allocation**: For ICT efforts to be implemented successfully in Nigerian Educational sector, enough financial resources must be set aside. The growth of ICT infrastructure, the purchase of equipment, the licensing of software, personnel training, and maintenance should all receive financing priority from the government. Government financing can be supplemented by investigating public-private partnerships and looking for other financial sources.

6. Theoretical Framework

Diffusion of Innovation (DOI) Theory is adopted for this research work. Diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962, and it is one of the oldest theories in social science. It was originated from communication to explain how, over time, an innovation, idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The Diffusion of Innovations theory explains how new ideas, practices, or technologies spread and are adopted within a social system. Owusu-Fordjour *et al.* (2020). In the context of ICT in curriculum delivery, this theory examines the adoption and diffusion of ICT tools among educators and institutions. It identifies those factors that influence the adoption process, such as the perceived relative advantage of using ICT, reliability and compatibility with existing practices, complexity, and test-ability. Understanding the diffusion of ICT within Nigerian tertiary institutions can help identify strategies to encourage widespread adoption and successful implementation of ICT in curriculum delivery (Rogers, 2003).

7. Data Presentation

SN	QUESTIONS	SD %	D %	U %	SA %	A %	TOTAL
1	Application of ICT can aid curriculum delivery in Nigerian tertiary institution	0	0	0	40 (66.7%)	20 33.3%	60 100%
2	State of ICT integration in curriculum delivery is impressive in my Institution	-	12 20%	0	23 38.3%	25 41.7	60 100%
3	ICT has increased number of enrollee in my institutions	-	-	-	35 58.3%	25 41.7%	60 100%
4	Admission barrier has been removed by ICT enabled Programs	7 11.7%	10 16.7%	-	33 55%	10 16.7%	60 100%
5	ICT application in curriculum delivery is easier and convenient for both lecturer and student	-	-	-	22 36.7%	38 63.3%	60 100%
6	ICT application in curriculum delivery has the potential to reduce level of illiteracy in Nigeria	-	-	-	50 83.3%	10 16.7%	60 100%
7	The cost of ICT is high for effective curriculum delivery in Nigeria	-	-	-	20 33.3%	40 66.7%	60 100%
8	There is no enough ICT facilities to adopt e-learning in my institution	26 43.3%	14 23.3%	-	12 20%	8 13.3%	60 100%
9	There is relatively low knowledge of ICT among students.	28 46.7%	12 20%	-	11 18.3%	9 15%	60 100%

10	There is discrimination of students with Online programs in my institutions	23 38.3	20 33.3%	-	9 15%	8 13.3%	60 100%
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Source: Field Survey 2023

8. Data Analysis

From question one all the respondent agreed that Application of ICT can aid curriculum delivery in Nigerian tertiary institution, with 66.7% of the respondent strongly agreed and 33.3% agreed to uphold the decision. On whether State of ICT integration in curriculum delivery is impressive in their Institution, only 20% of the respondent disagreed while 80% agreed which mean that the decision of the 80% will be upheld. The third question is on whether the ICT integration into curriculum delivery increased the number of enrollees in the institution, the totality (100%) of the respondent agreed that the number of enrollees increased. Question four was to determine whether Admission barrier has been removed by ICT enabled Programs, 7 respondents (11.7%) and 10 (16.7%) strongly disagreed and agreed respectively, while 71.7 % agreed that admission barrier was removed with adoption of ICT. The fifth question is to know if ICT application in curriculum delivery is easier and convenient for both lecturer and student, all the respondent agreed that ICT application made it convenient for both lecturers and students. The next question is to decide whether the ICT application can reduce the level of illiteracy as a national issue and all (100%) the respondent agreed to that. On whether the cost is high or not in Nigeria or not, the respondent agreed that the cost of ICT in curriculum delivery is high. On whether if there is adequate facility to aid ICT application in curriculum delivery in the institution or not, 66.6% of the respondent agreed that the institution has the facility to support ICT curriculum delivery. Question Nine is to identify whether there is adequate ICT knowledge by the students to key in into the program, 66% Of the respondent is of the view that student do not have adequate ICT knowledge to apply for e-learning. 71.6% of the respondents are of the view that there is no discrimination in certificates of graduates in both Traditional and ICT enabled graduates.

9. Conclusion

This study concluded that adoption and application of ICT on curriculum delivery in tertiary institution in Nigeria has tremendously influenced the modernization and modern work practice in academics. It breaks geographical barrier to study, encourage work and learn for economically disadvantaged students through various course delivery apps such as Zoom, Google class, among others. The use of ICT in curriculum delivery has the potential to revolutionize education by expanding access to information, enhancing learning experiences, fostering collaboration, and developing critical skills. The various challenges posing as threat to effective ICT application are basically what can be addressed to harness the best potential of the emerging technology in curriculum delivery.

Recommendations

Based on the findings of this research study, the following recommendations were put forward;

- Tertiary institutions in Nigeria should embrace the application of ICT in curriculum delivery to be at par with the current global practice
- Adequate fund should be allocated to ICT infrastructural development in tertiary institutions to enhance effective curriculum delivery
- Regulatory policy should be enacted to protect data of lecturer and students against hackers
- There should be special low rate for educational apps to encouraged its usage
- Capacity building on ICT for lecturers and students should be embarked upon, this will enable the duo to be up to date in usage of ICT in curriculum delivery and learning.

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