



Extent of Lecturers' Utilization of ICT for Academic Delivery in Tertiary Institutions in Enugu State, Nigeria: Post Covid-19 Pandemic Experience

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Abstract

Information and Communication Technologies (ICTs) have become essential tools for teaching and learning in academic institutions, particularly in Nigerian tertiary institutions, including those in Enugu State. During the COVID-19 pandemic, ICT tools were mandated to facilitate remote education, but their implementation was hindered by factors such as lecturers' strikes, poor infrastructure, and lack of access to technology. Post-pandemic, there has been a shift toward utilizing ICT in academic delivery, but the extent of this utilization and its impact on learning outcomes remains unclear. This study aimed to assess the extent to which tertiary institutions in Enugu State utilize ICT for academic delivery in the post-COVID-19 era, examine its effect on learning achievements, identify challenges, and propose solutions to those challenges. The study targeted a population of 692 lecturers from selected public tertiary institutions, with a random sample drawn for analysis. The findings reveal that the extent of ICT utilization for academic delivery in the post-COVID-19 period is low, with a group mean of 2.16, falling below the benchmark of 2.50. This indicates that while ICT tools are present, their use in e-teaching, e-learning, and e-evaluation is limited. In contrast, the study found that ICT utilization positively influences learning achievements, with a group mean of 2.54, indicating a moderate to high impact on student learning outcomes. Despite this positive effect, significant challenges hinder ICT use, including industrial disputes, power supply issues, connectivity problems, poverty, and insufficient funding. The study found that these challenges are pervasive and strongly affect the effective integration of ICT, with a high mean score of 2.91, indicating that the challenges are very prominent and pose serious barriers to academic success. The study concludes that while ICT utilization in tertiary institutions in Enugu State has the potential to enhance learning outcomes, various structural and institutional challenges must be addressed for its full potential to be realized. Recommendations include improvements in infrastructure, funding, and conflict resolution to foster a more conducive environment for ICT-based academic delivery.

Keywords Lecturer's Utilization; Academic Delivery; Tertiary Institutions; Enugu State; Post Covid-19 Pandemic Experience

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Introduction

Before Covid-19 pandemic, Information and Communication Technology (ICT) had permeated every human endeavour and changed the methods, procedures and patterns of doing work in all walks of life. Education was not an exception. In Nigeria and in Enugu State in particular, ICT tools had been utilized in tertiary institutions for academic delivery but when Covid-19 surfaced, every socio-economic activity was grounded by the government in order to stem the spread of the deadly virus. During Covid-19 Pandemic, ICT was thought to be the panacea to the lockdown on education which lasted for over 11 months. But due to the lecturers' strikes in the tertiary institutions nation-wide, the hope of using ICT to salvage the situation was dashed. This was because the Academic Staff Union of Polytechnics (ASUP) and the Academic Staff Union of Universities (ASUU) were already on strike agitating for the fulfillment of their different respective demands from the Federal Government (Adesina, (2021).

These were the academicians who, if they were on ground, would have tackled the problem of lockdown by using ICT tools to counter the impasse on educational delivery in Nigeria during the pandemic. Moreover, Covid-19 pandemic was unprecedented as it had never been experienced before. So, tertiary institutions were taken by the storms and no one was prepared beforehand to proffer any meaningful solutions. The strict protocols or restrictions placed on social interaction by the government further worsened the situation because it stopped in-person social contact.

As the lockdown lasted and seemingly grounded education for a period longer than it affected other sectors of the economy, the media was agog with campaign and jingles urging educational institutions to use ICT tools to salvage the situation. But because tertiary institutions were on strike and because the technology was relatively new and slowly developing and growing with its skill acquisition requirements, there were bound to be challenges on its road to progress. Some of the challenges being resistance to change, poverty on the part of students and lecturers, ignorance of the use of computers, power failures, lack of ICT infrastructure, poor or no network connections, data access problems, incompetent personnel, poor funding of schools, corruption of the type of stealing or diverting ICT tools, insecurity, labour unrest etc.

Covid-19 pandemic may have illuminated the minds of tertiary institutions and may have accentuated the use of ICT for academic delivery as a viable option to the orthodox method in some quarters, but the extent of its impact on lecture delivery in the post pandemic era calls for an investigation.

Statement of the Problem

The justification for this research stems from the fact that there is an overwhelming notion that there is increased use of ICT for academic delivery especially in tertiary institutions in the post Covid-19 Pandemic. But what is not known is the extent of the utilization of ICT in educational delivery. This is the base line for this research. When Covid-19 spread to Nigeria from Wuhun in China in 2019, it forced the government to shut down all socio-economic activities for as long as 11 months. However, the government introduced some protocols and measures to ease off the lockdown and allowed people to access some necessities like food, money, and medication. But, when markets, banks, churches, hotels and hospitals were partially opened educational institutions remained closed for a longer period. It was feared that if this imbroglio continued, it would adversely affect education especially at the tertiary level. Because it was not known how long this would last, the media, NGOs and educational agencies urged schools to embark on utilization of ICT tools for continuing education. This gesture was frustrated because lecturers at the tertiary institutions had already been on strike and would not back down to engage in online tutorials whereas their demands had not been resolved. This means that the much-expected accentuation of the utilization of ICT for academic delivery in tertiary institutions did not materialize during the lockdown.

However, Covid-19 succeeded in illumining the minds of educational institutions and accentuated the need to have and use alternative approaches to the chalk-board method so that both students and lecturers would corroborate and have access to lectures synchronously and asynchronously using ICT tools. Covid-19 pandemic brought to light the weaknesses of rote learning and the chalk board method in times of war and emergencies. When Covid-19 Pandemic rescinded, and normalcy returned to tertiary institutions, it was not readily known the extent of the utilization of ICT for academic deliver in tertiary institutions in Enugu state in post Covid-19 era, hence the researcher

embarked on this research to determine the extent of the utilization of ICT for academic delivery in tertiary institutions in Enugu State Nigeria, after Covid-19.

Objective of the Study

The main objective of this research is to know the extent of lecturers' utilization of ICT for academic delivery in tertiary institutions in Enugu State, Nigeria in post Covid-19 Pandemic.

Other objectives are:

- i. To know how lecturers' utilization of ICT for academic delivery affects learning achievements among students in tertiary education in Enugu State, Nigeria in the post Covid-19 pandemic.
- ii. To know what challenges that are facing lecturers' utilization of ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic.
- iii. To know the best solutions to the challenges in the utilization of ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic.

Research Questions

1. To what extent do lecturers utilize ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic?
2. To what extent does lecturers' utilization of ICT for academic delivery affect learning achievements among students in tertiary education in Enugu State, Nigeria in the post Covid-19 pandemic?
3. What are the best solutions for the challenges facing lecturers' utilization of ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic?

Conceptual Framework

Extent, in the context of this research, implies the degree or level of utilization of ICT in delivering lectures to students in tertiary institutions in Enugu State Nigeria. Tertiary institutions refer to post-secondary institutions while post Covid-19 Pandemic refers to the period after the Corona Virus lockdown and the consequential Protocols of 2019.

It has been noted that the concept of Information and Communication Technology (ICT) encompasses all electronic devices that could be utilized in communication and in the promotion of education both in-person chalk board system and online, connecting participants from remote places synchronously and asynchronously. These devices include the computer, various types of telephones, projectors, CCTV cameras, videos, smart boards, televisions, radios, megaphones, micro-phones, loud speakers and printers. Others include various electronically enabled network software programs that also enable communication and corroboration between source and end users and comprise E-mail, Facebook, WhatsApp, Instagram, Youtube, Twiter, Zoom, etc. The internet and the various search engines are the foundation upon which these devices rest. Ghavifekr and Rosdy (2015) and Hugh (2013) in Luhanya, Bakkabulindi and Muyinda (2017).

Utilization of ICT for academic delivery in tertiary institutions implies that ICT education enables the following:

E-teaching: This is known as electronic teaching but may also be called by other names like cloud-teaching, internet teaching, virtual teaching, on-line teaching or on-line education. Through e-teaching, teacher and student interact via computers without meeting physically. It requires a computer, the internet apps, a modem and connectivity to establish an interface between the teacher and the learner.

E-learning: This refers to learning with the computer via the Internet. It is also referred to as virtual learning whereby the educator and the learner do not necessarily have to meet but can interact via electron communication devices like the computer that has internet connections and social communication apps like twitter, e-mail, telegram, zoom app, WhatsApp, text and voice calls etc. Mohammad (2020) and (Lisa, 2020).

E-measurement: This refers to the process of checking how much students understand the concepts and it is done by giving them on-line tests, assignments and or tasks to perform. Such tests, assignments and tasks are usually calibrated and weighted and students' scores serve as their measures of performance.

E-evaluation: This is a sort of on-line assessment of students based on their performances in series of tests, assignments or tasks at a time or over a period of time in what is known as continuous assessments.

Virtual Teacher-Student Interface: This is on-line interconnectivity between the teacher and the student via a computer or any mobile app which enable communication to take place between the educator and the learner without having physical contact. (Jordan, 2020).

On-line collaboration between lecturers: This means a team or group effort among educators in tertiary institutions whereby educators work together and share their experiences and challenges on-line on the best way to achieve success in their duties.

Utilization of ICT for academic delivery and learning achievements among students in tertiary education in Enugu State, Nigeria before Covid-19 pandemic

Deepak and Swati (2021) noted that the integration of ICT tools compliments the traditional pedagogy and enables varied and improved interaction between students and lecturers synchronously and asynchronously for academic delivery and achievement.

Rakesh (2020) opined that ICT tools for education assume other names like e-learning, online learning, digital learning and is the teaching and learning method via the web or standalone personal computer which allows students and their lecturers to have interface and solve their problems as well as communicate without physically coming together at a particular place and time. This method allows teaching and learning to be achieved. The use of CD ROM, Flash Drives, Zoom, WhatsApp, E-mail, Voice mail, Text Messages, etc. facilitate this method.

Ghavifekr et al (2015) and Hugh (2013) in Luhanya, Bakkabulindi and Muyinda (2017) noted that ICT on-line education was a combination of computers, software, networks, satellite links and related systems that allow teachers and students to access and share information and knowledge in a variety of forms that support constructivist teaching and learning. This is the integration of various electronic devices to effect communication and furthering of education and is known by various other names such as ICT education, e-learning, e-teaching, e-education, multi-media, remote learning, etc.

On the other hand, Aktaruzzaman, Shamim and Clement (2011), Coleman, Gibson, Cotten, Howell-Moroney and Stringer (2016) and Keengwe, Onchwari and Wachira (2008). opined that the application of on-line education otherwise referred to as the integration of Technology (ICT) in teaching and learning help in expanding access to education to the increasingly digital workplace through information distribution, learning management systems and managing of educational services and make them affordable and available anytime and anywhere.

It has also been observed that one of the methods where technology has greatly impacted education is by integrating ICT into education and it has become a process of nurturing the educational environment to the effect that the ideas of teaching construction and the way one can build and consolidate meaningful learning based on technology are now being widely accepted (Parra, 2012 and Díaz-Barriga, 2013; in Ronald, 2017).

Utilization of ICT for academic delivery and learning achievements among students in tertiary education in Enugu State, Nigeria during Covid-19 Pandemic

Learning and Achievement Gaps

Alaba and Oyelade (2020) observed that Covid-19 has widened the achievement gap in academics among students. The isolation and separation from social contact and communal learning encapsulated in the face-to-face methodology has not only widened the learning gap, but also the achievement gap. The achievement gap in academics is the disparity in performance among students that show up in grades, test scores, dropout rates and programme completion rates at record times. It is also the extent to which a student or institution has achieved its educational goals either in the long or short term and this is measured in terms of grade point average in the case of a student and in terms of graduation rates in the case of institutions. It is obvious that Covid-19 pandemic that disrupted face-to-face studies and forced students to study online negatively affected most students' academic performance, especially those who were digitally disadvantaged, especially in the third world countries. (Polyxeni & Eli, 2021).

Emma, Brian, Jimmy and Allen (2020) observed that online education could not in any way provide the quality of education that could be delivered in the classroom. This means that online education is inferior to the in-person or face-to-face type of education that is provided for students in the classroom. The lockdown not only caused disproportionate learning losses among income levels in the US between white and black students and Hispanic heritage but it widened the already existing gap and will eventually lead to drop outs among disadvantaged students mainly the blacks and students of Hispanic heritage whose parents are socioeconomically and educationally disadvantaged. These parents and their children are lacking in the basic resources to cope with online education during the pandemic. The result is that there are learning and achievement gaps between this set of students and those from the affluent families with the basic resources. This is a global phenomenon that affected not only the so-called developed countries; it is even more so in the developing countries of which Nigeria is one. However, it was observed that online education was necessary for academic achievements for people who could not afford the face-to-face method due to socio-economic reasons such as war, poverty, distance, disability, absence of school, and for convenience.

Peter, Arun and Mark (2021) observed that within a short time during the pandemic lockdown in the Netherlands, students learned a little less studying at home via online studies. In Nigeria, and in Enugu State in particular the case was the same because the technology is not readily available, electricity disruptions impeded the use of the technologies, low or absence of network connections, poverty and lack of data, distractions and illiteracy on the part of parents were some of the impediments to studying online in this part of the world. A massive online education in tertiary institutions in Enugu State Nigeria that accommodated most students during the pandemic was more or less media propaganda than reality. That was why parents, teachers, students, governments, non-governmental organizations, the media and all stake holders mounted pressure on governments to lift the protocols and resume education in all spheres. After Covid-19 Pandemic, educational institutions still rely heavily on in person, face-to-face classroom method of teaching and learning, although little assignments are often assigned to students online. Computer based tests and examinations (CBTs) organized by institutions and educational agencies like JAMB, WAEC and NECO are once in a while and is only for candidates seeking admission into tertiary institutions.

Pamela (2020) observed that the socio-economic status and level of education of parents contribute to students' achievement in academics. Where parents are not highly educated and therefore earn less income there is little possibility of them helping their children do their homework or acquire the devices needed. And with covid-19 pandemic slamming a lockdown on schools, it falls on parents to provide the needed coaching opportunities for their children. But where the parents cannot, because they are socioeconomically and educationally disadvantaged, there will be a learning and achievement gap amongst the students so affected. In Enugu State Nigeria, the socioeconomic and educational statuses of most parents are between the low and middle income groups. The rest who are the majority are artisans and traders who hardly provide three square meals for their families every day. Because they are socioeconomically and educationally disadvantaged, they cannot assist their children with the new phenomenon of online educational technology. For students from such families, Covid-19 has created not only a learning gap but

also achievement gaps in their studies because within the period the lockdown lasted, most of them were not only out of school but also out of learning. They lacked the resources to continue their studies online. Now that Covid-19 Pandemic is over and the students are back to school, use of ICT for academic delivery has once again been relegated to the background where it plays the second fiddle.

Dara (2021) observed that rather than improve education through online, Covid-19 lockdown had instead magnified the gap in learning and achievement of students within the American society due to shortage of resources. If America, the number one country in the world experienced a learning loss and achievement gap due to learning gaps and shortage of resources during Covid-19, developing countries like Nigeria may not be telling itself the truth if it claims that Covid-19 pandemic and the imposed lockdown has magnified the use of online studies in Nigeria within the period of the lockdown of Covid-19. The realities on the ground are not congruent with such assessment. Those realities are that literacy level in Nigeria is still low; there is poverty, shortage of resources, shortage of skilled teachers or instructors, connectivity problems, shortage of data, hostile environments, and moreover, the educational institutions were on strike before and during the lockdown for the fact that ASUU, SSANU, ASUP and NASUU were on strike and would not participate in any academic activities during the lockdown, etc. These factors seriously impeded and still impede online studies in tertiary institutions in Nigeria and in Enugu State in particular.

Jessica (2020) observed that in the UK, Corona-virus pandemic lockdown instead of bridging the gap of inequalities in education brought about by socioeconomic and educational positions of parents it widened the gap and has even caused the dropping out of school of some students who could no longer persevere.

Suffice it to ask, if online studies is widening the learning and achievement gaps in education in Britain during the lockdown in spite of their advanced technologies and socioeconomic advancement, could Nigeria in its socio-economic quagmire – poverty, illiteracy, poor technology, unsteady power supply, poor internet connectivity, corruption etc. rightly claim that online education was achieving phenomenal progress during covid-19 pandemic lockdown? Such a statement is incongruent with the truth because the resources for such phenomenal progress were, and are still lacking.

Ted (2021) observed that in a recent UNICEF survey, covid-19 had some damages on the mental health and education of children in the Middle East and parts of North Africa. Notable among these damages include ineffective distance learning, disruptions in the educational system, gap in academic achievements due to lack in resources, limited access to the internet and lack of support from family members as well as connectivity problems to the internet and teachers. Relating this to Nigerian experience and tertiary institutions in Enugu State in particular, one could find no difference with the UNICEF experience in the Middle East and part of North Africa during the pandemic lockdown. In Nigeria, joblessness of both youths and adults contributed to the poverty problems that made the affordability of online or distance learning practically difficult. Lack of steady supply of electricity, internet connectivity problems and lack of computer skills also hindered the efforts made to study online.

Utilization of ICT for Academic Delivery and Learning Achievements among Students in Tertiary Education in Enugu State, Nigeria in the Post-Covid-19 Pandemic

John, Izang and Akorode (2015) noted that in Nigeria, (and in Enugu State in particular), educational achievement gaps persist among the various socio-economic classes. These include the urban and rural dwellers and ethnic groups. Educational attainment levels create a divide that impacts an individual's access to opportunities for personal growth and professional advancement. To bridge these gaps, on-line studies also referred to digital learning have emerged as a solution because it enables instructors to reach out to their students who are separated from them and the rest of the class either asynchronously or synchronously.

Technology makes it increasingly possible for students to learn by active participation by adapting to the use of social networks such as YouTube, Facebook, WhatsApp, Internet, Zoom, etc., whereby they socialize and collaborate regardless of place and time. On-line education provides the strategies for bridging educational achievement gaps by addressing the disparities in academic achievements among people from different socio-economic backgrounds

and abilities. It creates equal opportunities for all to achieve their full potentials and succeed in the society (Michael, Ana & Jim, 2013).

Achievement in education is not measured by money or tangible assets although these may be associated to it. Rather, it is the level of success and proficiency a person attained in educational pursuits and typically measured by grades, test scores, certificates, and degrees earned. It is an aspect of personal development that is often reflected in better job opportunities, bigger pay, better standard of living, communication skills, critical thinking, and positive evaluation of phenomena and social standing. (Shyamal, 2020). Achievement in education is influenced by several factors such as innate abilities of the learner, the mental health of the learner, the environment, available resources, and the ability of the teacher.

Davis (2019) noted that online education is an internet-based learning system that connects learners and teachers of different backgrounds who use different electronic devices to effect teaching and learning that can take the form of asynchronous and synchronous learning to bridge the gap in educational achievement. Online education makes it possible for people with disabilities and minorities alike to have access to high-quality learning and through interactions with the teachers and peers at the same time (synchronously) through electronic devices and at their own preferred times, (asynchronously). This enables learners to achieve success in education and bridge the gap in educational attainment and then widen their opportunities for jobs, improved self-worth, personal ego, communication skills, objective perceptions of the world view of things and overall performance (Robert, 2014).

Anyim (2021) observed that ICT tools used for education is digital learning and that means teaching and learning experience devoid of paper materials but involving electronic scripts as soft copies and accessed through electronic gadgets like mobile phones, computers and via the internet.

Cook (2014) observed that information communication technologies provide the techniques for internet-based studies also known as E-learning, digital learning and various other terms. It provides a wide spectrum of learning opportunities for learners to interact with people from diverse socio-economic backgrounds and climes and offers them the opportunities to attain educational success to enhance their skills, knowledge and overall opportunities.

Digital learning is timeless and learning is no longer confined to a particular classroom and the pedagogy used by the teacher because learners are allowed to construct their own meanings through interactions and observations. Moreover, learning is no longer restricted to the pace of the entire classroom or the students because interactive and adaptive devices allow students to study and learn at their own pace using digital contents.

Aguba (2009) observed that digital learning is now beyond the walls of a classroom and can take place anywhere without physical barriers like distance and time because web-based, database and software facilities like Zoom and Google Classroom are available and people make use of these technologies to improve on their educational achievements.

Challenges Facing Lecturers' Utilization of ICT for Academic Delivery in Tertiary Institutions in Enugu State in the Post Covid-19 Pandemic.

The challenges are the factors posing threats and frustrating the utilization of ICT for academic delivery in tertiary institutions in Nigeria and in Enugu State in particular. These challenges are as listed below:

Strikes: Industrial unrest or strikes by lecturers in tertiary institutions is one of the stumbling blocks to steady academic flow of academic exercises and achievements. Strikes usher in discontent that disrupts studies and sends the students packing and as it lasts, academic activities are brought to a halt. During strikes, the utilization of ICT for academic delivery is usually put on hold until the demands of the striking lecturers are resolved (Iyabo, 2021).

Inertia: Some lecturers remain adamant to adopt and adapt to the new technologies for teaching. The resistance to change and unwillingness to train on the new technologies by lecturers create a problem for digital learning where

the lecturer prefers the traditional method of teaching and may even sabotage the installation of the new technologies.

Power Supply: Steady power supply is essential for the integration of all the ICT devices but it has always been a problem in Nigeria. Without steady power supply, the guarantee for the utilization of ICT for academic delivery is a sham because power supply is usually needed to power on the gadgets, charge the batteries and make the necessary connections to the internet and the media. The use of generators and solar power as alternatives to electricity has become the exclusive privilege of the affluent due to the hike in the price PMS and solar energy.

Cost: The cost of acquisition of ICT equipment is usually not simple, so many departments and institutions do not have the requisite technologies for online studies and may depend on funding by the government. Until the government decides to fund such departments or institutions, the much needed ICT for academic delivery continues to suffer.

Funding: No or poor funding negatively affects the utilization of ICT for academic delivery in tertiary institutions in Nigeria. Sometimes, the funding may come but they do not satisfy the needs of the department of institution because the government brings outdated equipment and this equipment may not be based on need assessment of the departments or institutions and often results to the institution or department rejecting the supplies and they just lay waste.

Poverty: This means lack of the means, especially money, to acquire the ICT gadgets like computers, mobile phones, data; training, electricity bills, generators or solar energy (as alternative to electricity). Poverty makes it difficult for both students and lecturers to not have the required ICT tools for academic delivery in tertiary institutions in Nigeria.

Corruption: This is all forms of unethical, anti-social and criminal behaviour that work against the desired objective of an organization. Corruption has resulted in the diversion of funds, purchase of outdated ICT materials, embezzlement of funds, purchase of fake materials, intimidation of institutions, bribery and blackmails by government officials who were delegated to make purchases and deliver ICT equipment to educational institutions. This works against the effective utilization of ICT for academic delivery in tertiary institutions in Nigeria and in Enugu State in particular because those materials may never be supplied or fake brands are made available and the institutions are either bribed to accept or intimidated to keep mute.

Connectivity and Data: Closely related to poverty and electricity, connecting to the internet has always been a problem due to lack of means to buy data and charge the gadgets due to no or unsteady power supply. When there is no electricity to charge the gadgets coupled with poverty to buy data, connecting to the medium or media via the internet becomes a problem that negatively affects the utilization of ICT for academic delivery.

The Environment: The enabling environment must be peaceful and not hostile for the mental health of both the students and the lecturers so that meaningful academic achievement can be achieved. Several parts of Nigeria, including Enugu State have witnessed unprecedented communal clashes with a record high of casualties. Land disputes between neighbouring communities on one hand and host communities and Fulani Herdsmen on the other hand have disrupted education in Enugu State to the effect the ICT utilization for academic delivery in the arrears affected have been ineffective due to fears of reprisal attacks as students and residents flee or live in fear.

Methodology

Research Design: This study employed a survey research design to assess the extent of ICT utilization for academic delivery in tertiary institutions in Enugu State, Nigeria, in the post-COVID-19 pandemic era.

Area of Study: The study was conducted in selected public tertiary institutions in Enugu State, Nigeria. These institutions were chosen based on their availability and willingness to participate in the research, as well as their involvement in ICT-based academic delivery.

Population of the Study: The population of the study consisted of 692 lecturers from selected public tertiary institutions in Enugu State. These lecturers were considered key stakeholders in academic delivery and were chosen because of their direct involvement in utilizing ICT for teaching and learning.

Sampling Technique: A random sampling technique was employed to select the participants for the study. This approach ensured that every lecturer within the selected institutions had an equal chance of being included in the sample, thereby minimizing potential biases. The sample size was determined to be statistically representative of the population, ensuring the results were applicable to the broader group of lecturers.

Instrumentation: The primary data collection instrument was a structured questionnaire designed to gather information on the extent of ICT utilization, its impact on learning achievements, and the challenges faced by lecturers in using ICT for academic delivery. The questionnaire was divided into three sections aligned with the research questions:

Section I: Focused on the extent of ICT usage in academic delivery (e-teaching, e-learning, e-measurement, etc.).

Section II: Focused on the effect of ICT utilization on student learning achievements.

Section III: Addressed the challenges faced by lecturers in utilizing ICT for academic delivery.

Validation and Reliability: To ensure the validity of the instrument, the questionnaire was reviewed by experts in educational technology and research methodology. Their feedback was incorporated to refine the questions and ensure they accurately captured the necessary data for addressing the research objectives.

The reliability of the instrument was tested through a pilot study conducted in a similar academic environment. A sample of lecturers was selected for the pilot, and a Cronbach's alpha coefficient was calculated. The instrument achieved a reliability value of 0.85, indicating that it was highly reliable for data collection.

Data Collection: The questionnaires were administered to the selected lecturers through both electronic and physical means, depending on the respondents' access to technology. Where electronic distribution was not feasible, printed copies were distributed, and participants were given a week to complete and return the questionnaires. The data collection process ensured that a sufficient number of responses were obtained to make meaningful conclusions.

Data Analysis: Data collected from the completed questionnaires were analyzed using descriptive statistical methods. The data were organized into tables, frequencies and percentages to summarize the demographic characteristics of the respondents and their responses to the research questions. For each research question, means and standard deviations were calculated to assess the extent of ICT utilization, its impact on learning achievements, and the level of challenges faced. A benchmark decision rule of 2.50 was used to interpret the mean scores. Responses with a mean score above 2.50 were considered as indicating a high extent, while those below 2.50 were considered low or moderate.

Results

Research Question One

To what extent do lecturers utilize ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic?

Table 1: Responses on the extent of lecturers’ utilization of ICT for academic delivery in tertiary institutions in Enugu State in the post-Covid-19 Pandemic

S/NO.	VARIABLES	POPULATION = 692		
		Group Mean	SD	Decision
1	Extent of e-teaching	2.16	0.27	LE
2	Extent of e-learning	2.19	0.29	LE
3	Extent of e-measurement	2.18	0.28	LE
4	Extent of e-evaluation	2.09	0.21	LE
5	Virtual teacher/student interface	2.18	0.32	LE
6	Online corroboration between lecturers	2.17	0.27	LE
Σ		2.16	0.27	LE

Source: Field Survey, 2025

From table 1, the calculated group mean is 2.16 and it is below the bench mark of 2.50. It indicates that the extent to which lecturers utilize ICT for academic delivery in tertiary institutions in Enugu State in the post-Covid-19 pandemic is still low.

Research Question Two

To what extent does lecturers’ utilization of ICT for academic delivery affect learning achievements among students in tertiary education in Enugu State, Nigeria in the post Covid-19 pandemic?

Table 2: Responses on the extent lecturers’ utilization of ICT for academic delivery affect learning achievements among students in tertiary institutions in Enugu State in the post-Covid-19 pandemic

S/NO.	VARIABLES	POPULATION = 692		
		Group Mean	SD	Decision
1	ICT enables synchronous learning.	2.43	0.31	LE
2	ICT enables asynchronous learning.	3.08	0.27	VHE
3	Students achieve objective through virtual learning.	2.04	0.26	LE
4	Students prefer in-person approach	3.06	0.3	VHE
5	Students prefer virtual learning.	2.09	0.29	LE
Σ		2.54	0.27	HE

Source: Field Survey, 2025

From table 2, the calculated group mean is 2.54 and it is above the bench mark of 2.50. It indicates that the extent to which lecturers utilize ICT for academic delivery affects learning achievements among students in tertiary institutions in Enugu State in the post-Covid-19 pandemic is high.

Research Question Three

To what extent are there challenges facing lecturers’ utilization of ICT for academic delivery in tertiary institutions in Enugu state in the post Covid-19 pandemic?

Table 3: Responses on the extent there are challenges facing lecturers' utilization of ICT for academic delivery affecting learning achievements among students in tertiary institutions in Enugu State in the post-Covid-19 pandemic

S/NO.	VARIABLES	POPULATION = 692		
		Group Mean	SD	Decision
1	Effect of Industrial disputes	3.02	0.12	VHE
2	Effect of Inertia	3.01	0.12	VHE
3	Effect of power supply	3.06	0.12	VHE
4	Effects of cost	2.99	0.12	VHE
5	Effects of Funding	2.00	0.12	HE
6	Effects of Poverty	3.01	0.12	VHE
7	Effects of Corruption	3.03	0.12	VHE
8	Effects of network Connectivity	3.08	0.23	VHE
9	Effect of Environment	3.06	0.30	VHE
Σ		2.91	0.15	VHE

Source: Field Survey, 2025

From table 3 above, the calculated group mean is 2.91 and it is highly above the bench mark of 2.50. It indicates that the extent to which there are challenges facing lecturers utilize ICT for academic delivery affecting learning achievements among students in tertiary institutions in Enugu State in the post-Covid-19 pandemic is very high.

Discussions

In table 1 above, all the variables showed a low extent response resulting to the group mean response of low extent with a mean rating of 2.16. Based on review of literature, the low extent response is predicated on several factors such as inertia, poor energy supply, poor connectivity and data problems, poverty and lack of means on the part of students and lecturers to buy computer-based equipment and data, lack of knowledge and skill in streaming lectures and sometimes, hostile environments. On the other hand, lecturers often fall out with the government on labour related issues that often culminate into lockdowns or strikes that often cause academic activities to cease until the dispute is settled. Utilization of ICT for academic delivery in tertiary institutions cannot thrive if there is no industrial harmony occasioned by peaceful resolution of conflicts between labour and management. These conflicts often result from governments' neglect of the needs of the tertiary institutions.

In table two above, the responses obtained by the respondents indicate that although, the extent of lecturers' utilization of ICT for academic delivery in tertiary institutions in Enugu state is low, the effect on learning achievement among students is high, with a mean rating of 2.54; a little above the bench mark of 2.50. The respondents agree that utilization of ICT for academic delivery achieves both synchronous and asynchronous teaching and learning but to low extents based on the factors mentioned in table one above. The table also shows that the achievement of objectives through ICT is low with a mean rating of 2.04 while their preference for in-person method reflects in the mean rating of 3.06 which is believed to be very high. The preference for virtual learning is low as indicated by the mean rating of 2.09 below the bench mark of 2.50. All the factors in table 1 above also affect the responses of the respondents in this table.

In table three above, the responses obtained from the respondents indicate that their challenges affecting the utilization of ICT for academic delivery in tertiary institutions in Enugu State Nigeria, in post Covid-19 pandemic. These challenges are very strong and pose serious obstacles to the utilization of ICT for academic delivery in tertiary institutions in Enugu State, in the post-Covid-19 pandemic. Unfortunately, these challenges have become part of the culture and tradition prevalent in our everyday life, and in the life on the campuses in particular to the effect that any improvement on them would appear to be asking for the impossible.

Industrial disputes have remained part and parcel of our academic life and have derailed academic achievements from time immemorial. In this table, the mean rating is 3.02, and rated VHE. Others are: inertia, 3.01, VHE; power

supply, 3.06, VHE; cost, 2.99, VHE; funding, 2.00, LE; poverty, 3.01, VHE; corruption, 3.03, VHE; network connectivity, 3.08, VHE and environment, 3.06 VHE. The implication is that with such strong challenges facing the use of ICT for academic delivery in the tertiary system of education in Enugu State, the achievement of high academic success rate is slim unless drastic measures are taken by the government, management of tertiary institutions, parents, organizations, communities and students to tackle the challenges and improve upon them.

Conclusion

Based on the findings, utilization of ICT for academic delivery is not a new phenomenon in Nigeria's education system. But at the time it was gradually gaining ground in the nation's education system, Covid-19 pandemic emerged and disrupted the progress it was making due to the lockdowns it imposed on all socio-economic activities in Nigeria coupled with the strikes embarked upon by labour unions in the nation's tertiary institutions at that time. Ironically, Covid-19 was believed to induce and accentuate the utilization of ICT for academic delivery in order to save the educational system from the quagmire, but unfortunately, the strict enforcement and observance of the concomitant protocols plus the effects of the striking workers' union nullified whatever effect ICT would have had on academic delivery within the time.

Apart from this, several factors posed challenges and frustrated the use of ICT for academic delivery during the pandemic. Notable among them were industrial disputes, inertia, power supply, poor funding, poverty, corruption, network connectivity and environmental insecurity.

It is unfortunate that even after transiting from the Covid-19 era to the post Covid-19 era these challenges still persist and continue to impede and disrupt the utilization of ICT for academic delivery in tertiary institutions in Nigeria, especially in Enugu State. Therefore, the extent of utilization of ICT for academic delivery in tertiary institutions in Enugu State is still low.

Recommendations

The following recommendations are based on the findings and conclusions made by the researchers: Lecturers and students should learn to embrace change and adapt to new pedagogies in lecture delivery as against inertia for new method, procedures and technologies. Lecturers should overcome inertia through enlightenment programmes such as seminars, training sessions and workshops organized by the management of the institutions or self-sponsored programmes in order to be abreast with new trends in their profession. On the other hand, the lecturers should train the students when they have successfully acquired the requisite skills and knowledge.

The management of the institutions should demand for fund from the government, provide the enabling environment, ensure steady supply of electricity and or alternative energy, equip the laboratories with the necessary gadgets, organize and train both the lecturers and students and ensure that there are security and discipline in the institutions. Management to apply strict compliance with the application of ICT for lecture delivery in the institutions.

Government should be held accountable for prompt and adequate funding of tertiary institutions based on need assessment, and disciplinary actions against corrupt officials who engage in acts capable of derailing the objectives of government.

Parents should make extra efforts to provide their wards or children with computer-based technologies that will enable them connect to the internet and therefore be able to interface virtually with their lecturers and course mates, synchronous and asynchronously. This will enable them to widen their horizon of knowledge through social media.

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