

Information and Communication Technology and the Administration of Universities in Nigeria

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Abstract

The study's main focus was on how information and communication technology (ICT) affected universities' ability to run effectively. The study population included all academic, non-academic and management staff members at the twenty-one public universities in the South-South Geopolitical Zone of Nigeria, and the research was ex post facto and descriptive. A stratified random sampling technique was used in the selection process. The study was guided by three hypotheses and three research questions. The study used a questionnaire to gather its data. Expert verification resulted in a reliability index of 0.85. The One-Way Analysis of Variance was used to test the hypotheses at the 0.05 level of significance, while the mean and standard deviation were utilized to address the research questions. The study's conclusions included, among other things, that there are not enough information and communication technology facilities in universities, which makes it difficult for academics to use ICT effectively. Other issues that tend to impede this include inadequate funding and erratic power supplies. The government should improve power supply to all universities, establish computer centers and cyber cafes in every department of universities, and increase funding for universities to meet the UNESCO standard of a 26% allocation in the nation's annual budget, among other recommendations based on the findings.

Keywords: information, communication, technology, management, universities

1. Introduction

The organization and management of people and resources to accomplish governmental objectives is known as public administration (Kupoluyi, 2018). The management of an

educational organization or institution to support teaching, learning, and research is known as educational administration, a subset of public administration. It entails assisting in the creation of goals and guidelines that will encourage the creation of suitable programs for teaching, learning, and acquisition, as well as managing staff and supplies for carrying out teaching and learning. University administration is a significant component of educational administration.

The scientific management of human and material resources to accomplish the goals and objectives of the university is known as university administration. The main responsibility of management is to make choices that advance organizational objectives. An administration's information requirements will depend on the decisions it makes. However, if information, communication, and technology facilities were implemented in the universities, the numerous outcries in Nigerian universities could have been prevented (Faloye and Oparah, 2007). Adedapo (2007) thus contended that efficient use of computers and other information, communication, and technological devices is necessary for the management of activities in schools.

Information and Communication Technology (ICT) has become an essential tool in the administration of higher education institutions worldwide. In Nigeria, and particularly in South-South Geopolitical Zone, the integration of ICT into university administration has significantly enhanced operational efficiency, decision-making processes, and service delivery (Adeyemo, 2021). Universities are complex institutions requiring the coordination of multiple administrative functions, and ICT has proven to be a transformative force in managing these processes effectively (Oni & Adebayo, 2019). ICT encompasses a range of technologies used to store, retrieve, transmit, and manipulate data. In university administration, ICT tools include management information systems, e-governance platforms, cloud computing, and digital communication channels (Olayemi, 2020). The application of these technologies in universities has facilitated improved student record management, efficient financial administration, seamless communication, and data-driven decision-making (Edewor et al., 2022).

One of the key areas where ICT has had a significant impact is in student information management. Traditionally, universities relied on manual record-keeping systems, which were prone to errors, loss, and inefficiencies. The adoption of ICT-based student information systems (SIS) has streamlined processes such as student registration, course allocation, result computation, and transcript generation (Akinyemi & Okafor, 2018).

ICT has also revolutionized financial administration in universities. With the implementation of digital payment systems, universities in South-South Geopolitical Zone have been able to manage tuition fee payments, staff salaries, and other financial transactions more transparently and effectively. E-payment platforms have reduced corruption and revenue leakages, ensuring accountability in financial management (Edewor et al., 2022). Effective communication is a critical component of university administration. ICT facilitates seamless communication between administrators, faculty, students, and other stakeholders through emails, portals, and virtual meeting platforms (Ajayi & Oyeniya, 2019). E-governance initiatives have improved access to information, reduced bureaucratic bottlenecks, and enhanced governance structures in universities (Oni & Adebayo, 2019).

Information and communication technology (ICT) made significant strides in the 1990s, particularly with its internal growth into the public domain (Akpan-Obong & Alozie, 2016). ICT integration in higher education is unavoidable since it involves using technology to improve planning, establish standards, implement changes, and track essential outcomes within the university system (UNESCO, 2002). The management of university administration can greatly benefit from the use of ICT, but there are significant obstacles to this, particularly in Nigeria. In fact, despite the numerous benefits of ICT in university administration, there are several challenges associated with its adoption in public universities in South-South Geopolitical Zone of Nigeria. These challenges include inadequate ICT infrastructure, lack of technical expertise, resistance to change, and limited funding (Okonkwo, 2023). Many universities struggle with unreliable internet connectivity, power supply issues, and cyber security threats, which hinder the full utilization of ICT for administrative purposes (Olayemi, 2020).

Similarly, the education sector is one area that our country has greatly benefited more and is impacted by the ICT revolution within the framework of universities. This is due to the fact that the National Universities Commission (NUC) took the initiative to purchase the Nigerian Universities Management Information System (NUMIS) project as a matter of purposeful policy (Raymond, 2006). It was noted that the use of ICT will assist with matters pertaining to teaching, research, community service, examination records, student records and transcripts, and admissions. Additionally, if ICT facilities are appropriately and properly utilized, staff monitoring and evaluation, physical plant surveying, curriculum development, fiscal management, and information dissemination will all increase the effectiveness of universities

(Omirin, 2007). In order to provide helpful recommendations, this study looks at the impact of ICT on the effective administration of Universities in South-South Geopolitical Zone of Nigeria.

1.1. Problem description

Despite the increasing adoption of ICT in university administration, many Public institutions in South-South Geopolitical Zone of Nigeria continue to face significant challenges in fully leveraging these technologies for effective governance and service delivery. The effective administration of universities relies heavily on accurate data management, efficient communication, transparent financial processes, and robust decision-making frameworks. However, issues such as inadequate ICT infrastructure, lack of digital literacy among administrative staff, cyber security concerns, and inconsistent policy implementation hinder the seamless integration of ICT in university governance (Okonkwo, 2023; Olayemi, 2020).

One of the major concerns is the persistent reliance on manual administrative processes, which leads to inefficiencies, delays, and data management errors (Akinyemi & Okafor, 2018). Many public universities in South-South Geopolitical Zone of Nigeria lack well-integrated student information management systems, resulting in errors in student records, delays in result processing, and difficulties in accessing academic information (Edewor et al., 2022). Furthermore, financial mismanagement remains a critical issue due to inadequate adoption of digital financial platforms, leading to revenue leakages and corruption (Adeyemo, 2021).

Additionally, poor internet connectivity and erratic power supply further exacerbate the problem, limiting the ability of universities to implement real-time digital solutions (Ajayi & Oyeniya, 2019). The lack of adequate training for administrative staff in the use of ICT tools also affects efficiency, as many personnel struggle with the transition from traditional paper-based processes to digital platforms (Oni & Adebayo, 2019). Furthermore, cyber security threats, including data breaches and hacking attempts, pose serious risks to confidential university records and financial transactions (Olayemi, 2020).

Given these challenges, it is imperative to examine the extent to which ICT impacts the effective administration of public universities in South-South Geopolitical Zone and to identify strategies for overcoming these barriers. Addressing these issues will not only enhance operational efficiency but also contribute to the global competitiveness of public universities South-South Geopolitical Zone and the broader Nigerian higher education sector (Okonkwo, 2023).

1.2. The study's objective

This study's primary goal is to investigate how information and communication technology (ICT) affects public universities in South-South Geopolitical Zone of Nigeria, and how well they are managed. The study's specific objectives are to:

- 1) Assess the availability of information and communication technology facilities in public universities in South-South Geopolitical Zone of Nigeria.
- 2) Determine the extent to which public universities in South-South Geopolitical Zone of Nigeria, are effectively managed through the use of information and communication technology.
- 3) Examine the difficulties in implementing information and communication technology effectively in South-South Geopolitical Zone of Nigeria's public university administration.

1.3. Research Questions

To direct the investigation, the following research questions were developed:

- 1) How available are information and communication technology facilities in South-South Geopolitical Zone of Nigeria's public university administrations?
- 2) What is the administrative standing of South-South Geopolitical Zone of Nigeria's public universities using information and communication technology?
- 3) What obstacles exist for the effective application of information and communication technology in South-South Geopolitical Zone of Nigeria's public university administration?

1.4. Hypotheses

The research investigated the following null hypotheses:

- 1) There is no significant difference between the mean scores of academic, non-academic and management staff on the degree of availability of information and communication technology facilities in public universities in South-South Geopolitical Zone of Nigeria.
- 2) There is no significant difference between the mean scores of academic, non-academic and management staff on the administrative standing of South-South Geopolitical Zone of Nigeria's public universities using information and communication technology.

- 3) There is no significant difference between the mean scores of academic, non-academic and management staff on the challenges facing the effective application of information and communication technology in the administration of public universities in South-South Geopolitical Zone of Nigeria.

2. Theoretical Framework

The theoretical framework for this study is grounded in relevant theories that explain the adoption, implementation, and impact of Information and Communication Technology on university administration. These theories help to conceptualize how ICT influences administrative efficiency, decision-making, and service delivery in higher education institutions. The first is Technology Acceptance Model (TAM). This model developed by Davis (1989), explains how users accept and use technology. TAM helps to explain why some administrators adopt ICT while others resist it. If university administrators perceive ICT tools as useful and ease to use, they are more likely to integrate them into their daily administrative tasks. Conversely, lack of training or fear of complexity may hinder adoption. Studies have demonstrated that universities with higher levels of ICT training and infrastructure tend to have better administrative efficiency (Olatokun & Bankole, 2011). Similarly, research by Afolayan et al. (2015) found that the perceived usefulness of ICT significantly influences its adoption in Nigerian higher education.

Secondly is the Diffusion of Innovation (DOI) theory. The DOI theory, developed by Rogers (1995), explains how new technologies and ideas spread within a social system. The theory identifies five key factors that influence technology adoption. These include Relative Advantage, Compatibility, Complexity, Trial ability, and Observability. DOI theory helps explain the varying rates of ICT adoption in universities in South-South Geopolitical Zone of Nigeria. Some institutions quickly adopt ICT due to its perceived advantages, while others resist due to challenges such as inadequate funding, lack of training, or infrastructural limitations. Understanding these factors can guide policymakers in designing strategies to improve ICT adoption in university administration. Research by Eze, Chinedu-Eze, & Bello (2018) showed that Nigerian universities that demonstrated higher compatibility with ICT and provided hands-on training for staff had faster adoption rates.

Thirdly is the Systems Theory. Systems Theory, as proposed by Bertalanffy (1968), views organizations as interconnected systems where different components work together to achieve

a common goal. In the context of university administration, ICT functions as an essential subsystem that enhances coordination, communication, and decision-making. Universities in South-South Geopolitical Zone of Nigeria operate as complex systems with various units (admissions, finance, human resources, examinations, etc.). ICT helps integrate these units, ensuring that administrative processes run smoothly. A failure in one part of the system (e.g., unreliable ICT infrastructure) can disrupt overall efficiency. Research by Alabi, Oyeyinka, & Adepoju (2019) found that universities with well-integrated ICT systems had better administrative performance due to improved interdepartmental coordination and information flow.

Fourthly is the Resource-Based View (RBV) Theory. This theory, developed by Barney (1991), suggests that an organization's competitive advantage depends on its ability to utilize valuable, rare, inimitable, and non-substitutable (VRIN) resources. ICT can be viewed as a strategic resource that enhances efficiency, productivity, and innovation in university administration. The RBV theory underscores the importance of investing in ICT as a strategic asset in universities. Institutions that allocate sufficient resources for ICT infrastructure, staff training, and maintenance can achieve better administrative efficiency and remain competitive globally. Owolabi & Okebukola (2020) found that universities in Nigeria that prioritized ICT investments had more efficient administrative operations and higher student satisfaction.

Finally, is the Unified Theory of Acceptance and use of Technology (UTAUT). This theory, developed by Venkatesh et al. (2003), integrates multiple technology adoption models, including TAM and DOI. It identifies four key determinants of technology adoption. These include Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. UTAUT is useful for understanding why some university administrators adopt ICT more readily than others. Factors such as institutional support, peer influence, and ease of use play a crucial role in determining ICT adoption levels in public universities in South-South Geopolitical Zone of Nigeria. Adeyemo et al. (2019) applied UTAUT to study ICT adoption in Nigerian universities and found that performance expectancy and facilitating conditions were the strongest predictors of ICT use in administration.

In fact, the theoretical framework for this study is built on multiple complementary theories that explain ICT adoption and its impact on university administration. TAM and UTAUT help understand user behavior, DOI theory explains the spread of ICT innovations, Systems Theory highlights ICT's role in organizational efficiency, and RBV underscores the strategic

importance and UTAUT is useful for understanding why some university administrators adopt ICT more readily than others. Factors such as institutional support, peer influence, and ease of use play a crucial role in determining ICT adoption levels in universities in South-South Geopolitical Zone

2.1. The Role of ICT in University Administration

ICT encompasses a range of technologies used to store, retrieve, transmit, and manipulate data. In university administration, ICT tools include management information systems, e-governance platforms, cloud computing, and digital communication channels (Olayemi, 2020). The application of these technologies in universities in South-South Geopolitical Zone has facilitated improved student record management, efficient financial administration, seamless communication, and data-driven decision-making (Edewor et al., 2022).

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Effective communication is a critical component of university administration. ICT facilitates seamless communication between administrators, faculty, students, and other stakeholders through emails, portals, and virtual meeting platforms (Ajayi & Oyeniya, 2019). E-governance initiatives have improved access to information, reduced bureaucratic bottlenecks, and enhanced governance structures in Delta State universities (Oni & Adebayo, 2019).

2.2. Challenges Facing ICT in University Administration

Information and Communication Technology has revolutionized university administration by improving efficiency, communication, and data management. However, despite its benefits, several challenges hinder its effective adoption and implementation in university

administration, particularly in Nigeria. These challenges range from infrastructural deficiencies to human and financial constraints. Many public universities in Nigeria, including those in South-South Geopolitical Zone, lack the necessary ICT infrastructure to support administrative functions. Essential components such as computers, servers, high-speed internet, and database management systems are either outdated or insufficient (Adeyemo, 2019). Limited ICT infrastructure affects core administrative tasks such as student registration, financial management, and staff record-keeping. A study by Olaniyi and Adebayo (2020) revealed that most Nigerian universities experience frequent system downtimes due to poor ICT infrastructure, leading to inefficiencies in administrative processes.

Also, effective ICT implementation requires reliable and high-speed internet access. Unfortunately, many universities in Nigeria struggle with slow and unreliable internet connections due to poor broadband penetration, high costs of service, and erratic electricity supply (Eze, Chinedu-Eze, & Bello, 2018). Owolabi and Okebukola (2021) found that only a small percentage of Nigerian universities have uninterrupted internet access, leading to delays in communication, online registration, and virtual administrative meetings.

The cost of acquiring, maintaining, and upgrading ICT infrastructure is a significant challenge. University administrations often face budget constraints, making it difficult to invest in modern technologies (Ojo & Olagunju, 2020). Expenses related to purchasing hardware, software licensing, cybersecurity, and ICT training further strain financial resources. According to Nwankwo (2021), over 70% of universities in Nigeria allocate less than 10% of their annual budget to ICT development, limiting the adoption of advanced administrative technologies.

Many university administrators and staff members lack the technical skills required to effectively use ICT tools. The absence of regular ICT training programs limits their ability to utilize digital platforms efficiently (Adebayo & Salami, 2019). The lack of digital literacy among staff leads to underutilization of available ICT resources. Eze et al. (2020) reported that in many Nigerian universities, less than 40% of administrative staff have received formal ICT training, leading to inefficiencies in ICT-based administrative processes.

Universities handle vast amounts of sensitive data, including student records, staff details, and financial transactions. However, inadequate cyber security measures expose these institutions to cyber threats such as hacking, phishing, and data breaches (Afolayan & Ajiboye, 2020). Many universities lack robust data protection policies, making them vulnerable to cyber-attacks. A study

by Alabi et al. (2021) found that over 60% of Nigerian universities have experienced some form of cyber-attack, leading to loss of critical administrative data and financial.

Some university administrators and staff members resist the adoption of ICT due to fear of job displacement, lack of digital skills, or preference for traditional administrative methods (Ajayi & Ogunyemi, 2019). Institutional bureaucracy also slows down decision-making processes related to ICT adoption. Research by Chukwuemeka and Okon (2020) showed that despite the availability of ICT tools in some Nigerian universities, many administrative staff still prefer manual processes, leading to inefficiencies.

Again, the degree to which lecturers are willing and able to use contemporary technologies in their instruction is a major factor in the success of ICT integration within the university system. According to a study by Okwudishu (2005), instructors are unable to use ICT because certain ICT components are not available in the university system. Adoni and Kpangban (2016) found in their research that the factors impeding the university and administration's use of the internet were a lack of appropriate search skills and access points in the school.

The unstable electricity supply in Nigeria significantly affects ICT usage in university administration. Many universities do not have reliable backup power sources, leading to frequent disruptions in ICT-based processes (Ogunlade & Adelokun, 2020). According to Oyetade (2021), more than 50% of Nigerian universities experience daily power outages, making it difficult to maintain ICT-driven administrative operations effectively.

The disparity in access to ICT tools among universities, administrators, and students is another major challenge. Rural universities and economically disadvantaged institutions often struggle with limited ICT access compared to well-funded urban universities (Adebanjo & Egunjobi, 2020). A survey by Omotayo and Adewale (2019) found that students and staff in rural universities in Nigeria have significantly lower access to ICT tools compared to their counterparts in urban institutions, affecting administrative efficiency.

Despite the importance of ICT in university administration, many institutions receive inadequate support from the government in terms of funding, policy implementation, and regulatory frameworks (Nwachukwu, 2021). Without proper government intervention, universities struggle to implement large-scale ICT projects. Eze (2020) found that only a small percentage of Nigerian universities benefit from government ICT funding initiatives, making it difficult for institutions to keep up with global ICT advancements.

Many universities in Nigeria rely on foreign ICT software and management systems, which may not be fully tailored to the local administrative context. The lack of locally developed ICT solutions often leads to inefficiencies and compatibility issues. Research by Ayodele and Oke (2021) showed that over 80% of university administrative software used in Nigeria is foreign-based, leading to integration challenges and high maintenance costs.

Despite the numerous benefits of ICT in university administration, several challenges hinder its full implementation in Nigeria as a whole. These challenges include inadequate infrastructure, poor internet connectivity, high costs, lack of ICT training, cyber security risks, resistance to change, erratic power supply, digital divide, weak government support, and limited localized ICT solutions. Addressing these issues requires concerted efforts from university management, government agencies, and stakeholders to invest in sustainable ICT policies, capacity building, and infrastructure development.

3. Methodology

This study employed ex-post facto and descriptive research designs. The methodology was ex-post facto since there was no manipulation of the variables, and data was already laid down in the institutions prior to the research (Adeyemi, 2011). The descriptive design was suitable because the study systematically collected data on a large population to examine the relationship between variables on the academic, non-academic and administrative staff of the twenty-one universities within the South-South Geopolitical Zone of Nigeria.

A representative sample of all the staff groups was achieved through the selection of 108 non-academic personnel, 147 academic staff, and 25 management staff using a stratified random sample technique whereby, the researcher-designed questionnaire consisted of two parts, with Section A gathering the demographics of participants (status, gender, and location), and Section B containing questions that answered the research questions. The items were rated along the four-point Likert scale, i.e., strongly agree (4), agree (3), disagree (2), and strongly disagree (1). The use of four-point scale instead of a five- or seven-point version was a calculated choice to eliminate the midpoint and to encourage the respondents to give an unambiguous view and to reduce bias to central tendency.

This approach enhances the functionality and decipherability of the data since the research will insist participants to specify a clear degree of assent or disagreement to the questions to ascertain its face and content validity by ensuring that the questions were relevant and that they

were broad enough to measure the constructs under investigation. The alpha method of Cronbach was used to determine reliability and the reliability index was 0.85, indicating high level of internal consistency of the items in the instrument. Two research assistants helped researchers manage data collection. The analysis of the data to the research questions used mean and standard deviation whereby a mean of 2.5 or more meant agreement and less than 2.5 meant disagreement. The assumptions formulated based on the research questions were tested against one-way analysis of variance (ANOVA) at the level of 0.05 alpha.

4. Results

This section centres on presenting the major findings of the research. The analysis of the research questions and the hypotheses would be presented one after the other:

4.1. Research Questions 1

This section presents the findings related to Research Question 1:

“How available are information and communication technology facilities in South-South Geopolitical Zone of Nigeria's public university administration?” The analysis is based on responses from academic, non-academic and management staff. Table 1 summarises the mean scores and standard deviations for each item, including the level of agreement among respondents regarding the availability of ICT facilities.

Table 1. Mean score and standard deviation of the availability of ICT facilities in South-South Geopolitical Zone of Nigeria's Public University administration

S/N	Items	Mean	SD	Decision
1.	No enough Desktop computer for every departmental office	3.30	.788	Retained
2.	No enough printers and other accessories in the schools	3.15	.807	Retained
3.	No departmental computer laboratories	3.25	.680	Retained
4.	Non-functional internet facilities in the schools	3.04	.887	Retained
5.	Photocopies in the office are not readily available	3.30	.773	Retained

The respondents' mean scores and standard deviation regarding the availability of information and communication facilities in South-South Geopolitical Zone Nigeria's public universities are displayed in Table 1. The table's result showed that every item had a high score and was rated higher than 2.50%, demonstrating the participants' strong agreement with the statement. Additionally, the departmental computer laboratories, functional internet facilities, photocopies

in the offices, enough printers and other accessories in the schools, and computers for every departmental office were not adequately provided in the universities.

4.2. Research Question 2

This section presents the findings related to Research Question 2:

“What is the administrative standing of South-South Geopolitical Zone of Nigeria’s Public Universities using ICT?” The analysis is based on responses from academic, non-academic and management staff. Table 2 summarises the mean scores and standard deviations for each item, including the level of agreement among respondents regarding the administrative standing of South-South Geopolitical Zone of Nigeria’s public universities in ICT usage.

Table 2. Mean score and standard deviation of the administrative standing of South-South Geopolitical Zone of Nigeria’s Public Universities in ICT usage

S/N	Items	Mean	SD	Decision
6	There is effective leadership in the universities	3.16	.937	Retained
7.	There is effective leadership in the communication channels in the universities	3.32	.778	Retained
8.	There is effective monitoring of instruction in the universities	3.09	.821	Retained
9.	There is effective monitoring of staff in the universities	3.31	.708	Retained
10.	There are effective disciplinary measures in the universities	3.16	.728	Retained

The respondents’ average evaluations of the administration quality at public universities in the South-South Geopolitical Zone were displayed in Table 2. The findings showed that every item had a score higher than 2.50, demonstrating strong agreement with the respondents’ statements and a high management level. Additionally, the responses were strongly acceptable, as indicated in the table, which showed how much Information and Communication Technology was used for the efficient management of public universities in South-south Geopolitical Zone of Nigeria. Effective leadership, efficient communication channels, efficient monitoring and supervision of instruction, sufficient motivation of staff, and efficient disciplinary measures in these universities are very few.

4.3. Research Question 3

This section presents the findings related to Research Question 3:

“What obstacles exist for the effective application of ICT in South-South Geopolitical Zone of Nigeria’s Public University administration?” The analysis is based on responses from non-

academic and management staff. Table 3 summarises the mean scores and standard deviations for each item, including the level of agreement among respondents regarding the obstacles for the application of ICT.

Table 3. Mean score and standard deviation of the obstacles exist for the effective application of ICT in South-South Geopolitical Zone of Nigeria's Public University administration.

S/N	Items	Mean	SD	Decision
11.	Irregular supply of power in the universities	3.16	.832	Retained
12.	Inadequate funding to provide ICT in the universities	3.23	.841	Retained
13.	Lack of expertise in the use of ICT in the universities	3.40	.765	Retained
14.	Lack of interest among members of staff of the universities to adopt the use of computers and other modern ICT facilities	3.20	.804	Retained
15.	Lack of willingness in the purchase of ICT equipment	3.29	.808	Retained

The mean ratings and standard deviation of the respondents regarding the obstacles to the efficient use of Information and Communication Technology in the management of public universities in South-South Geopolitical Zone of Nigeria, were displayed in Table 3. The findings showed that every item in the table from 11 to 15 on the respondents' scores exceeded 2.50, demonstrating a high degree of agreement with the statements made by the participants. Additionally, the responses were strongly acceptable, as evidenced in table 3 with the efficient use of information and communication technology on the management of public universities in South-South Geopolitical Zone of Nigeria. These include inconsistent power supplies, insufficient funds to provide ICT facilities, a lack of ICT expertise, staff members' disinterest in embracing the use of computers and other contemporary ICT facilities, and a lack of willingness to buy ICT equipment.

4.4. Hypothesis 1 (Ho₁)

This section presents the findings related to hypothesis 1:

“There is no significant difference in the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria.” The analysis is based on responses from academic, non-academic and management staff. Table 4 summarises the One-way Analysis of Variance on the mean scores of agreement among respondents regarding the degree of availability of ICT facilities.

Table 4. One-way Analysis of Variance (ANOVA) on the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	439.677	2	219.838	18.049	.000
Within Groups	3373.809	277	12.180		
Total	3813.486	279			

$\alpha = 0.05$

Table 4 showed an F value of 18.049 and a p value of .000. Testing at an alpha level of .05, the p value is less than the alpha level. So, the null hypothesis which states that there is no significant difference in the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria is rejected. This indicates that there is a significant difference in the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria. Therefore, Post Hoc analysis is required to know where the differences lie.

Table 5 presents a post hoc analysis on the mean ratings of the academic, non-academic and management personnel on the level of availability of ICT facilities in the public universities in the South-South geopolitical zone of Nigeria.

The results are well-conducted methodologically, as the table reports significant differences of the management personnel with academic and non-academic personnel, using the means difference, standard errors, significant value, and confidence interval of 95 percent, which are represented by the asterisks. The management personnel is found to be much more available to ICT facilities than the academic staff (mean difference = -4.177, $p = 0.000$) and the non-academic staff (mean difference = -4.574, $p = 0.000$). The confidence intervals have no intersection with zero, which is also a further support of the importance of the results. This difference between academic and non-academic staff (mean difference = 0.397, $p = 0.370$) is non-significant. The strongest difference is observed with the management personnel and the other two staff groups. This shows that there is a difference in the perceived or actual accessibility of ICT facilities where managerial staff are enjoying increased access in universities of the South-South geopolitical zone of Nigeria. The inclusion of statistical data in Table 5 provides the support of the validity and the clarity of such conclusions.

Table 5. Post Hoc Analysis of the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria

(I) ICT	(J) ICT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Academic	Non-Academic	.397	.442	.370	-.47	1.27
	Management Staff	-4.177*	.755	.000	-5.66	-2.69
Non-Academic	Academic	-.397	.442	.370	-1.27	.47
	Management Staff	-4.574*	.775	.000	-6.10	-3.05
Management Staff	Academic	4.177*	.755	.000	2.69	5.66
	Non-Academic	4.574*	.775	.000	3.05	6.10

The mean difference is significant at the 0.05 level.

4.5. Hypothesis 2 (Ho₂)

This section presents the findings related to hypothesis 2:

“There is no significant difference in the mean scores of academic, non-academic and management staff on the administrative standing of South-South Geopolitical Zone of Nigeria’s Public Universities using ICT” The analysis is based on responses from non-academic and management staff. Table 6 summarises the One-way Analysis of Variance on the mean scores of agreement among respondents regarding the administrative standing of public universities.

Table 6. One-way Analysis of Variance (ANOVA) on the mean scores of academic, non-academic and management staff on the administrative standing of South-South Zone of Nigeria’s Public Universities using ICT

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	310.929	2	155.465	12.245	.000
Within Groups	3516.714	277	12.696		
Total	3827.643	279			

$\alpha = 0.05$

Table 6 showed an F value of 12.245 and a p value of .000. Testing at an alpha level of .05, the p value is less than the alpha level. Therefore, the null hypothesis which states that there is no significant difference in the mean scores of academic, non-academic and management staff on the administrative standing of South-South Geopolitical Zone of Nigeria’s Universities using ICT is rejected. This implies that there is a significant difference in the mean scores of academic, non-academic and management staff on the administrative standing of South-South

Geopolitical Zone of Nigeria’s Public Universities using ICT. Therefore, Post Hoc analysis is required to know where the differences lie.

As indicated in Table 7, the post hoc statistical test presents a statistically significant difference on the mean score of the administrative status of South-South Geopolitical Zone of Nigeria public university regarding the use of ICT among the various staff groups. The research shows that the average results of the management staff are significantly lower than the average results of both the academic staff and non-academic staff with a significant difference in the average results (3.720 and 3.659, respectively) and the p-value is very significant (p =.000). The comparison confidence intervals of these comparisons are beyond 0 hence supporting the validity of the findings. The difference between academic and non-academic employees is not significant (mean difference = -0.060) and does not have a statistical significance (p =.894), as the confidence interval includes zero, which means that the views of these workers have big similarities. The largest difference witnessed in the attitude towards the administrative status of ICT in these universities is observed between the management personnel and other staff categories, which demonstrates a sharp difference in perspective at the administrative level.

Table 7. Post Hoc Analysis of the mean scores of academic, non-academic and management staff on the administrative standing of South-South Geopolitical Zone of Nigeria’s Public Universities using ICT

(I) ICT	(J) ICT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Academic	Non-Academic	-.060	.452	.894	-.95	.83
	Management Staff	-3.720*	.771	.000	-5.24	-2.20
Non-Academic	Academic	.060	.452	.894	-.83	.95
	Management Staff	-3.659*	.791	.000	-5.22	-2.10
Management Staff	Academic	3.720*	.771	.000	2.20	5.24
	Non-Academic	3.659*	.791	.000	2.10	5.22

The mean difference is significant at the 0.05 level

4.6. Hypothesis 3 (H₀₃)

This section presents the findings related to hypothesis 2:

“There is no significant difference in the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria.” The analysis is based on

responses from non-academic and management staff. Table 8 summarises the One-way Analysis of Variance on the mean scores of agreement among respondents regarding the challenges facing the effective application of ICT of public universities.

Table 8. One-way Analysis of Variance (ANOVA) on the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	386.857	2	193.428	14.384	.000
Within Groups	3724.968	277	13.448		
Total	4111.825	279			

$\alpha = 0.05$

Table 8 shows an F value of 14.384 and a p value of .000. Testing at an alpha level of .05, the p value is less than the alpha level. Hence, the null hypothesis which states that there is no significant difference in the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria is rejected. This implies that there is a significant difference in the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria. Therefore, Post Hoc analysis is required to know where the differences lie.

As displayed in Table 9, the most significant difference in the perception of the challenges associated with the successful execution of the ICT in the management of the public universities in South-South Geopolitical Zone of Nigeria is between the management staff and both academic and non-academic staff. The post hoc analysis indicates that the mean score of management personnel was 3.959 and 4.269 points of higher than the academic staff and non-academic staff respectively. Both the differences were statistically significant at the level of 0.05 ($p = .000$). The difference between academic and non-academic workers is not significant and is not statistically significant (mean difference = .309, $p = .506$), and it can be argued that these groups have similar perceptions of ICT issues. The findings reveal that management personnel have a greater awareness of, or are closer to the problems related to ICT implementation in university administration. This significant gap justifies the call to policy measures and support systems that target management personnel to enhance the overall

performance of ICT adoption and utilisation in the management operations of the public universities.

Table 9. Post Hoc Analysis of the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria

(I) ICT	(J) ICT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Academic	Non-Academic	.309	.465	.506	-.61	1.22
	Management Staff	-3.959*	.793	.000	-5.52	-2.40
Non-Academic	Academic	-.309	.465	.506	-1.22	.61
	Management Staff	-4.269*	.814	.000	-5.87	-2.67
Management Staff	Academic	3.959*	.793	.000	2.40	5.52
	Non-Academic	4.269*	.814	.000	2.67	5.87

The mean difference is significant at the 0.05 level.

5. Discussion of Findings

The researchers followed the data's organizational structure when discussing the study's findings and cited pertinent literature to support the arguments. The study's findings from the research questions employed showed that neither lecturers' ICT skills nor the use of ICT resources for teaching and research are very high or non-existent. According to Table 1's findings, there are not enough computers in schools for every department, along with a shortage of printers and other accessories. Departmental computer labs are also absent, internet access is not always reliable, and the majority of lecturers do not have laptops for research and teaching.

Additionally, the first hypothesis which stated that there is no discernible difference in the mean scores of academic, non-academic and management staff regarding the availability of ICT (information and communication technology) facilities in South-South Geopolitical Zone of Nigeria's public universities was rejected. This indicates that there is a significant difference in the mean scores of academic, non-academic and management staff on the degree of availability of ICT facilities in Public Universities in South-South Geopolitical Zone of Nigeria. Therefore, Post Hoc analysis is required to know where the differences lie. The results are well-conducted methodologically, as they indicated significant differences of the management personnel with

academic and non-academic personnel, using the means difference, standard errors, significant value, and confidence interval of 95 percent, which are represented by the asterisks. The management personnel is found to be much more available to ICT facilities than the academic staff (mean difference = -4.177, $p = 0.000$) and the non-academic staff (mean difference = -4.574, $p = 0.000$). This result is consistent with the assertion made by Nworgu (2006) that higher education institutions do not have enough ICT resources. He believed that more funding for education should come from the federal and state governments, and that universities falling under their jurisdiction should be provided with basic ICT resources. Also, Owolabi and Okebukola (2021) found that only a small percentage of Nigerian universities have uninterrupted internet access, leading to delays in communication, online registration, and virtual administrative meetings.

Similarly, research question two disclosed the administration quality in public universities in South-South Geopolitical Zone of Nigeria. These findings demonstrated the universities' high degree of administration. The wise use of information and communication technology within the university system is a direct result of effective university management. These include efficient leadership in academic settings, efficient lines of communication, efficient oversight of instruction, sufficient staff motivation, and efficient disciplinary procedures in academic settings. Furthermore, hypothesis two, which stated that there is no discernible difference between the non-academic and academic mean scores for the degree of ICT facility utilization in administration at public universities in South-South Geopolitical Zone of Nigeria was rejected. This implies that there is a significant difference in the mean scores of academic, non-academic and management staff on the administrative standing of South-South Geopolitical Zone of Nigeria's Public Universities using ICT. Therefore, Post Hoc analysis is required to know where the differences lie. The research shows that the average results of the management staff are significantly lower than the average results of both the academic staff and non-academic staff with a significant difference in the average results (3.720 and 3.659, respectively) and the p-value is very significant ($p = .000$). The largest difference witnessed in the attitude towards the administrative status of ICT in these universities is observed between the management personnel and other staff categories, which demonstrates a sharp difference in perspective at the administrative level. This is consistent with the findings of Adedapo (2007), who claimed that efficient use of computers and other information and communication technology tools is necessary for university administration to manage operations. Also,

According to Nwankwo (2021), over 70% of universities in Nigeria allocate less than 10% of their annual budget to ICT development, limiting the adoption of advanced administrative technologies. The main responsibility of management is to make choices that advance organizational objectives. An administration's information requirements will depend on the decisions it makes.

Again, research question three demonstrated that before information and communication technology can be used in public university administration in an efficient manner, there are some challenges to be addressed. These problems included erratic power sources, a lack of resources for the purchase of ICT equipment, a lack of IT know-how, a lack of enthusiasm among staff members for using PCs and other ICT tools, and a reluctance to purchase ICT goods. Additionally, hypothesis three which stated that there is no appreciable difference in the average scores of academics and non-academics with respect to the difficulties in effectively utilizing ICT resources to manage public universities in South-South geopolitical Zone of Nigeria was rejected. This implies that there is a significant difference in the mean scores of academic, non-academic and management staff on the challenges facing the effective application of ICT in the administration of Public Universities in South-South Geopolitical Zone of Nigeria. Therefore, Post Hoc analysis is required to know where the differences lie. It showed that the most significant difference in the perception of the challenges associated with the successful execution of the ICT in the management of the public universities in South-South Geopolitical Zone of Nigeria is between the management staff and both academic and non-academic staff. The post hoc analysis indicates that the mean score of management personnel was 3.959 and 4.269 points of higher than the academic staff and non-academic staff respectively. Both the differences were statistically significant at the level of 0.05 ($p = .000$). The difference between academic and non-academic workers is not significant and is not statistically significant (mean difference = .309, $p = .506$), and it can be argued that these groups have similar perceptions of ICT issues. The findings reveal that management personnel have a greater awareness of, or are closer to the problems related to ICT implementation in university administration. This is consistent with the claim made by Howell et al. (2003), who listed several problems, including inadequate funding, a shortage of computers, a staff shortage of ICT specialists, staff members' incapacity to integrate computers into different disciplines, and a lack of a suitable microcomputer. The primary obstacles to the use of ICT in university administration are the teaching programs. Additionally, Okwudishu's (2005) study found that

employees are unable to use ICT because certain components are unavailable within the university system. Also, Eze et al. (2020) reported that in many Nigerian universities, less than 40% of administrative staff have received formal ICT training, leading to inefficiencies in ICT-based administrative processes.

6. Conclusion

The use of information and communication technology in higher education can improve both the volume and quality of instruction in a number of ways. This implies that ICTs are an essential components of public universities' efficient administration in South-South Geopolitical Zone. It is, in actuality, a crucial factor in the efficient administration of colleges. ICT is pervasive in practically every endeavor of humankind, but it has not been extensively incorporated into the teaching and learning procedures in universities in South-South Geopolitical Zone of Nigeria. Our post-secondary institutions' internet, network, computer, and funding infrastructure are all woefully inadequate. This always makes it impossible to use the few resources effectively. Universities, particularly those in South-south Geopolitical Zone of Nigeria, should place a strong emphasis on ICT if Nigeria is to catch up to the developed world.

6.1. Implications of the Study

The findings of this study have several implications for university administrators, policymakers, educators, students, and other stakeholders in higher education. The study underscores the need for public universities in South-South Geopolitical Zone of Nigeria to formulate and implement policies that fully integrate ICT into their administrative frameworks to enhance efficiency, transparency, and accountability. The findings suggest that policymakers should increase funding for ICT infrastructure in universities, ensuring that institutions have the necessary resources to leverage technology for improved administration. The study highlights the importance of secure ICT systems to store and manage academic records, financial transactions, and staff information, thereby minimizing the risks of data loss or manipulation. ICT adoption in administration directly impacts academic activities by facilitating online course registration, e-learning platforms, and digital libraries, thereby enhancing students' learning experiences. The study implies that the automation of administrative processes can lead to cost savings by reducing paperwork, minimizing manual labor, and optimizing financial resources. The study highlights the necessity of expanding internet connectivity and digital access in universities to ensure that all staff and students can fully utilize ICT tools. The study calls for efforts to bridge

the digital gap among university stakeholders by providing adequate training, support, and infrastructure to ensure equitable access to ICT resources.

6.2. Limitations of the Study

Despite the significance of this study, certain limitations may have affected the scope, methodology, and generalizability of the findings. This study focuses solely on universities in Delta State, Nigeria. While the findings may provide valuable insights into ICT adoption in university administration within the state, they may not be entirely applicable to other Geopolitical Zones in Nigeria or other countries with different socio-economic and technological environments. The study may have relied on a limited number of respondents, including university administrators, ICT personnel, and faculty members. A larger sample size covering more institutions and administrative units could have provided a more comprehensive understanding of ICT's impact. Technology evolves rapidly, and by the time the study is published, new developments in ICT may render some findings outdated. Universities may implement new ICT policies or infrastructure that could change the landscape of ICT adoption in administration. Budgetary limitations may have affected the extent of data collection, preventing the inclusion of a wider range of stakeholders. Future research should consider expanding the scope to include more universities, adopting longitudinal studies to track ICT impact over time, and employing mixed-method approaches to minimize biases. Despite these limitations, the findings remain relevant in shaping ICT policies and administrative reforms in higher education institutions.

6.3. Recommendations

The study's conclusions led to the following recommendations being made:

- 1) Employees ought to be made aware of the role that ICT plays in university administration.
- 2) The state budget's allotment for education should be increased by 26% to support universities in compliance with the UNESCO standard.
- 3) The government ought to intensify its efforts to enhance the nation's university power supply.
- 4) Provide staff with ongoing instruction on how to use ICT tools.
- 5) A setting like this should be established to pique staff members' interest in ICT use in higher education.

- 6) To guarantee that ICT resources are available for use in teaching, learning, and research, computer centers and cyber cafes ought to be present in every department.
- 7) The National University Commission should give the universities access to the ICT infrastructure and tools they require.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this article. No financial, personal, or professional relationships have influenced the research, analysis, or conclusions presented in this work.

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