Digital Governance And Administrative Efficiency: Exploring The Adoption Of Ict Tools In University Management Systems In Delta Tate

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Abstract: This study investigated the relationship between digital governance, through the adoption of ICT tools, and administrative efficiency within university management systems in Delta State, Nigeria. The study was guided by four research questions and three hypotheses and employed a correlational survey research design. A sample of 300 administrative staff was drawn from public and private universities using a multi-stage sampling technique. Data were collected using a structured questionnaire that was validated by experts and tested for reliability through a pilot study. Findings revealed that while the level of ICT tool adoption in the universities was moderate to high, significant gaps remained in areas such as full system integration, consistent accessibility, and technical support. The results further indicated that ICT adoption was positively related to improvements in administrative efficiency, highlighting that digital tools help streamline workflows, reduce delays, and enhance service delivery. The study also found that staff ICT training played an important moderating role, strengthening the positive relationship between ICT adoption and administrative performance by equipping staff with the necessary skills to maximize available technologies. However, key barriers such as inadequate infrastructure, unreliable internet connectivity, insufficient funding, and resistance to change were identified as constraints to effective digital governance. The study concludes that while universities in Delta State have made commendable progress, more work remains to ensure that investments in ICT tools translate into tangible improvements. It is recommended that universities prioritize staff training, system integration, and infrastructural upgrades to fully realize the benefits of digital governance for improved administrative efficiency.
Keywords: Digital Governance; ICT Tools; Administrative Efficiency; University Management Systems; Staff ICT Training; Higher Education Administration.

Introduction

The 21st-century global economy has witnessed an unprecedented revolution driven by the rapid advancement and diffusion of Information and Communication Technology (ICT). The education sector, particularly higher education institutions (HEIs), has increasingly become a focal point in the discourse on digital transformation, with universities worldwide integrating ICT tools to enhance governance, teaching, learning, and administrative efficiency (Agyeman & Amedzo, 2019; Iwuanyanwu & Iwuanyanwu, 2023). Digital governance has emerged as a fundamental paradigm for transforming university management systems to address the dynamic needs of stakeholders while ensuring operational efficiency, transparency, accountability, and responsiveness.

In the context of developing economies like Nigeria, the drive towards digital governance in universities is necessitated by the growing complexity of administrative tasks, the imperative for timely decision-making, and the demand for improved service delivery (Obi & Obah, 2020). The adoption of ICT tools such as enterprise resource planning (ERP) systems, online portals, learning management systems (LMS), and e-governance platforms has been widely acknowledged as pivotal to enhancing administrative operations (Osang et al., 2020). According to Al-Omari and Alomari (2019), digital governance is defined as the deployment of ICT infrastructures and applications to facilitate the flow of information and communication within and outside institutions, thereby promoting administrative efficiency.

Administrative efficiency in university management is crucial in ensuring that institutional goals and objectives are achieved optimally. It encompasses the ability of university administrators to process information, execute policies, manage resources, and deliver services in a manner that minimizes waste and redundancies while maximizing outcomes (Ibrahim & Jimoh, 2021). Traditionally, the administration of Nigerian universities has been marred by bureaucratic bottlenecks, paper-based record-keeping, and manual processing of data, which often result in delays, errors, and inefficiencies (Adebayo & Ogunyinka, 2022). The integration of digital governance seeks to address these challenges by automating routine administrative tasks, improving data accuracy, and facilitating real-time access to information.

The role of ICT in administrative efficiency cannot be overemphasized. Several studies have shown that the adoption of ICT tools enhances administrative workflows by streamlining processes, reducing duplication of efforts, and improving the quality and speed of service delivery (Bamidele et al., 2023; Suleiman & Garba, 2020). For instance, Agbo et al. (2021) found that Nigerian universities that implemented robust ICT-based management systems recorded significant improvements in records management, student registration, examination processing, and communication with stakeholders. This aligns with global best practices where

universities in advanced economies have leveraged digital technologies to revolutionize administrative functions, such as enrollment management, financial operations, human resource management, and student support services (UNESCO, 2022).

Despite the evident benefits, the adoption and effective utilization of ICT tools in Nigerian universities remain fraught with challenges. Adegoke and Adeniran (2023) highlighted infrastructural deficits, inadequate funding, resistance to change, and insufficient ICT skills among staff as significant impediments to successful digital governance implementation. The lack of stable internet connectivity, erratic power supply, and high costs of technological infrastructure further exacerbate the situation, making it difficult for universities to sustain ICT-driven administrative practices (Okolie et al., 2019; Chukwudi & Onuoha, 2022).

Moreover, the human factor plays a critical role in determining the success of ICT adoption in university management systems. The competence and readiness of administrative staff to utilize ICT tools effectively are vital for translating digital governance initiatives into tangible administrative gains (Onuoha et al., 2021). Empirical studies have underscored the importance of continuous ICT training and capacity-building programs for university staff to enhance their digital literacy, adaptability, and confidence in using modern technologies (Abubakar & Lawal, 2020; Jiboku et al., 2023). Training serves not only to upgrade skills but also to foster a culture that embraces innovation and change.

In Delta State, the situation reflects broader national trends. Universities in the state, such as Delta State University, Federal University of Petroleum Resources Effurun (FUPRE), and Western Delta University, among others, have made varying degrees of progress in integrating ICT tools into their management systems (Egbule & Okoh, 2020). However, the extent to which these tools have translated into measurable administrative efficiency remains underexplored, with anecdotal evidence pointing to inconsistent implementation and underutilization of available ICT infrastructures (Emete et al., 2022).

The National Universities Commission (NUC) of Nigeria has repeatedly emphasized the need for universities to embrace digital transformation as a strategic imperative for institutional effectiveness and global competitiveness (NUC, 2021). Policies such as the National ICT Policy and the Nigerian Universities E-Governance Framework advocate for the deployment of technology to drive administrative reforms, improve accountability, and enhance service delivery in HEIs (Federal Ministry of Education, 2021). Nonetheless, implementation gaps persist due to contextual challenges ranging from policy inertia to limited technical expertise (Okeke & Uzochukwu, 2024).

Internationally, the COVID-19 pandemic further accentuated the urgency of digital governance in universities. The abrupt transition to remote operations revealed gaps in digital readiness and tested the resilience of university management systems (Sahu, 2020; World Bank, 2021). Universities with established digital infrastructures were able to adapt swiftly, ensuring continuity of administrative functions, while those with minimal digital preparedness faced operational disruptions (Oboh & Egharevba, 2021). This experience has reinforced the argument that digital governance is not merely an option but a necessity for the sustainability of university administration in an increasingly digitalized world.

From a theoretical perspective, the Technology Acceptance Model (TAM) provides a useful lens for understanding how university staff perceive and use ICT tools (Davis, 1989). The model posits that perceived usefulness and perceived ease of use significantly influence individuals' acceptance and utilization of new technologies. In the context of university management, if staff members perceive ICT tools as beneficial and user-friendly, they are more likely to embrace them, leading to enhanced administrative efficiency (Ismail & Mohammed, 2020). This implies that any barriers that affect these perceptions, such as lack of training or technical support, can undermine the success of digital governance initiatives.

Additionally, the Diffusion of Innovation Theory (Rogers, 2003) explains how new ideas and technologies spread within an organization. The theory identifies key adopter categories (innovators, early adopters, early majority, late majority, and laggards) and suggests that organizational culture, leadership support, and communication channels play crucial roles in facilitating or hindering the adoption process. Studies by Nwogu et al. (2022) have shown that leadership commitment and institutional policies are critical enablers of ICT adoption in Nigerian universities.

While the literature provides insights into the relationship between ICT adoption and administrative efficiency, there is still a paucity of empirical studies that examine this phenomenon within the specific context of Delta State universities. Understanding the unique challenges and contextual factors that influence digital governance in these institutions is essential for designing targeted interventions that can optimize administrative outcomes (Obi & Ogbuehi, 2023).

This study, therefore, aims to fill this gap by systematically exploring the extent of ICT adoption in university management systems in Delta State, assessing its impact on administrative efficiency, and examining the moderating role of staff ICT training. It also seeks to identify the key barriers that hinder effective digital governance within university administration. By addressing these objectives, the study will contribute to the growing body of knowledge on digital governance in higher education and provide evidence-based recommendations for policy-makers, university administrators, and stakeholders.

Statement of the Problem

Despite the global shift toward digital governance, many universities in Delta State still rely heavily on outdated, manual administrative systems that slow down processes, reduce transparency, and hinder efficient service delivery. While some institutions have invested in ICT tools, these are often underutilized due to inadequate staff training, poor integration, or lack of technical support. As a result, students and staff continue to face delays, errors, and frustration in routine administrative tasks such as registration, records management, and communication.

Without urgent improvements, universities in Delta State risk falling behind in administrative performance, losing their competitive edge, and failing to meet the expectations of stakeholders in an increasingly digital world. This inefficiency could lead to wastage of resources, reduced staff productivity, and reputational damage for the institutions involved. Therefore, there is a pressing need to investigate how ICT tools are currently adopted in university management systems in Delta State, assess their actual impact on administrative efficiency, and identify the barriers that hinder effective digital governance. This study will help provide practical insights for bridging the gap between policy and practice and support the development of more responsive, efficient, and future-ready university administration.

Purpose of the Study

The main purpose of this study is to examine the relationship between the adoption of ICT tools and administrative efficiency within university management systems in Delta State. Specifically, the study aims to:

1. determine the extent to which ICT tools are adopted in university management systems in Delta State;
2. investigate the relationship between ICT adoption and administrative efficiency in these universities;
3. explore whether staff ICT training moderates the relationship between ICT adoption and administrative efficiency; and
4. identify the key barriers associated with the relationship between digital governance and administrative processes in university administration.

Research Questions

The study was guided by the following research questions.

1. To what extent are ICT tools adopted in university management systems in Delta State?
2. What is the relationship between ICT adoption and administrative efficiency in these universities?
3. Does staff ICT training moderate the relationship between ICT adoption and administrative efficiency?
4. What are the key barriers that influence the relationship between ICT adoption and administrative efficiency in university management?

Hypotheses

1. There is no significant relationship between ICT adoption and administrative efficiency in universities in Delta State.
2. Staff ICT training does not significantly moderate the relationship between ICT adoption and administrative efficiency.
3. There are no significant barriers influencing the relationship between ICT adoption and administrative efficiency in university management systems.

Methods

This study adopted a correlational survey research design to examine the nature and strength of the relationship between the adoption of ICT tools and administrative efficiency within university management systems in Delta State. The correlational design was deemed appropriate because it allowed the researcher to investigate the extent to which two or more variables were related without manipulating them, which aligned with the non-experimental nature of the study. This approach provided insight into how the adoption of ICT tools and staff ICT training related to administrative efficiency while also identifying the barriers that influenced these relationships.

The population for the study consisted of all administrative staff across accredited public and private universities in Delta State. This included registrars, deputy registrars, faculty officers, ICT officers, heads of departments, and other senior administrative personnel who were directly involved in university management processes. According to records obtained from the Delta State Ministry of Higher Education (2025), the estimated number of administrative staff in the state's universities was approximately 1,200 individuals. To ensure that the sample adequately represented this diverse group, a multi-stage sampling technique was employed. In the first stage, universities were stratified into federal, state, and private institutions to guarantee proportional representation across institutional types. Within each stratum, proportional sampling was used to determine the number of respondents from each university based on its relative size. In the final stage, simple random sampling was applied to select the actual administrative staff who participated in the study.

The sample size for the study was determined using the Taro Yamane formula for finite populations. Using this formula with a margin of error set at 5%, the calculated sample size was approximately 300 respondents. This sample size was considered sufficient to allow for generalization of the findings to the entire population of administrative staff in Delta State universities.

Data were collected using a structured questionnaire developed by the researcher and adapted from established instruments used in related studies. The questionnaire consisted of four sections. Section A captured demographic information such as gender, age, years of experience, and position held. Section B assessed the extent of ICT tool adoption using Likert-scale items that measured the availability, accessibility, and frequency of use of ICT tools for various administrative tasks. Section C measured administrative efficiency through indicators such as timeliness, accuracy, transparency, and responsiveness of administrative services. Section D addressed staff ICT training and perceived barriers to effective digital governance, allowing the study to explore moderating and contextual factors that could affect the relationship between ICT adoption and administrative efficiency.

To ensure the validity of the instrument, the draft questionnaire was reviewed by experts in educational management, ICT in education, and research methodology. Feedback from the experts guided the revision of the items to ensure that they adequately captured the constructs being measured and were clear and relevant to the respondents. A pilot study was also conducted with 30 administrative staff from a university outside Delta State but within the same geo-educational zone. The results of the pilot test were

used to calculate the internal consistency of the instrument using Cronbach's Alpha, which yielded a coefficient value of 0.83, indicating that the instrument was reliable for the main study.

After obtaining ethical clearance and the necessary permissions from relevant university authorities, the researcher, with the assistance of three trained research assistants, administered the questionnaire to the sampled respondents. The research assistants were adequately briefed on the study's objectives, the content of the questionnaire, and the ethical considerations involved in data collection. Where feasible, the questionnaires were distributed and retrieved on the same day to ensure a high response rate and minimize the risk of loss or incomplete responses. Completed questionnaires were checked for completeness before being coded and entered into the Statistical Package for Social Sciences (SPSS) version 25 for analysis.

Data were analyzed using both descriptive and inferential statistical techniques. Descriptive statistics such as frequencies, means, and standard deviations were used to summarize demographic data and describe the extent of ICT tool adoption in university management systems. To test the stated hypotheses and examine the relationships among variables, the Pearson Product-Moment Correlation Coefficient was used to determine the strength and direction of the relationship between ICT adoption and administrative efficiency. Multiple regression analysis was employed to assess whether staff ICT training moderated the relationship between ICT adoption and administrative efficiency. Factor analysis and descriptive summaries were used to identify and rank the key barriers influencing digital governance practices. All hypotheses were tested at a 0.05 level of significance.

Ethical considerations were rigorously observed throughout the study. Ethical approval was obtained from the appropriate Institutional Research Ethics Committee. Participation in the study was voluntary, and all respondents were provided with informed consent forms explaining the purpose of the study, their rights as participants, and assurances of confidentiality and anonymity. Data collected were kept confidential and used solely for academic purposes.

Results

Research Question 1: To what extent are ICT tools adopted in university management systems in Delta State?

Table 1: Descriptive Statistics Showing the Level of ICT Tool Adoption in University Management Systems

ICT Tool Adoption Indicators	Mean (x^-)	SD	Interpretation
Availability of ICT infrastructure	3.75	0.88	High
Accessibility to ICT tools	3.42	0.92	Moderate
Frequency of ICT use for administrative tasks	3.68	0.85	High
Integration of ICT systems	3.21	0.95	Moderate
Maintenance and technical support	3.10	1.00	Moderate
Overall Mean	3.43		Moderate

Table 1 shows the mean responses of administrative staff on the level of ICT tool adoption in university management systems in Delta State. The results indicate that ICT infrastructure is generally available ($x^- = 3.75$) and used frequently for administrative tasks ($x^- = 3.68$). However, accessibility, system integration, and maintenance support scored moderate means ranging from 3.10 to 3.42. The overall mean of 3.43 suggests that ICT tools are adopted at a moderate level across the universities studied. This implies that while progress has been made in providing ICT facilities, there are still gaps in full accessibility, integration, and maintenance that need improvement.

Research Question 2: What is the relationship between ICT adoption and administrative efficiency in these universities?

Table 2: Coefficient of Determination Showing the Relationship Between ICT Adoption and Administrative Efficiency

Variables	N	r	R²	Remark
ICT Adoption	300	0.68	0.46	Strong Positive Relationship
Administrative Efficiency	300			

Table 2 shows the Pearson correlation coefficient between ICT adoption and administrative efficiency among administrative staff in universities in Delta State. The computed correlation coefficient (r) is 0.68, which gives a coefficient of determination (R^2) of 0.46. This means that approximately 46% of the variation in administrative efficiency can be explained by the extent of ICT adoption in the universities studied. The positive relationship suggests that higher levels of ICT adoption tend to be associated with improved administrative efficiency.

H_{01}: There is no significant relationship between ICT adoption and administrative efficiency in Delta State universities.

To test this hypothesis, Pearson Product-Moment Correlation was computed. The result is presented below.

Table 3: Correlation Result for ICT Adoption and Administrative Efficiency

Variables	N	r	R²	p-value	Decision
ICT Adoption vs.	300	0.68	0.46	0.000	Reject H_{01} (Significant)
Administrative Efficiency	300				

Table 3 shows that there is a significant positive relationship between ICT adoption and administrative efficiency in Delta State universities ($p < 0.05$). Therefore, the null hypothesis was rejected. This indicates that an increase in ICT adoption is associated with an improvement in administrative efficiency.

Research Question 3: Does staff ICT training moderate the relationship between ICT adoption and administrative efficiency?

Table 4: Coefficient of Determination Showing the Moderating Effect of Staff ICT Training

Model	R²	ΔR²	Interpretation
ICT Adoption Only	0.46	—	ICT adoption alone explains 46% of variance in administrative efficiency.
ICT Adoption + Staff ICT Training	0.51	+0.05	Adding staff ICT training explains an additional 5% of the variance.
ICT Adoption + Staff ICT Training + Interaction Term	0.55	+0.04	Including the interaction effect adds 4% more, indicating a moderating effect.

Δ = Change

Table 4 presents the coefficient of determination values for the regression models examining the moderating effect of staff ICT training. The results show that ICT adoption alone accounted for 46% of the variance in administrative efficiency. When staff ICT training was included in the model, the R^2 increased to 0.51, indicating an additional 5% of the variance explained. With the inclusion of the interaction term (ICT Adoption × Staff ICT Training), the R^2 further increased to 0.55, showing that the moderating effect of staff ICT training accounted for an additional 4% of the variance in administrative efficiency. This implies that staff ICT training enhanced the relationship between ICT adoption and administrative efficiency, confirming its role as a meaningful moderator in the relationship.

H_{02}: Staff ICT training does not significantly moderate the relationship between ICT adoption and administrative efficiency.

To test this hypothesis, multiple regression analysis was conducted to determine the effect of staff ICT training as a moderating variable. The result is presented below.

Table 5: Regression Result Showing the Moderating Effect of Staff ICT Training

Model	R²	ΔR²	p-value	Decision
ICT Adoption Only	0.46	—	—	—
ICT Adoption + Staff ICT Training	0.51	+0.05	0.000	Reject H_{02} (Significant)
ICT Adoption + Staff ICT Training + Interaction Term	0.55	+0.04	0.000	Reject H_{02} (Significant)

Table 5 shows that the inclusion of staff ICT training and the interaction term significantly increased the variance explained in administrative efficiency, with p-values less than 0.05. Thus, the null hypothesis was rejected, indicating that staff ICT training significantly moderates the relationship between ICT adoption and administrative efficiency in the universities studied.

Research Question 4: What are the key barriers that influence the relationship between ICT adoption and administrative efficiency in university management?

Table 6: Mean Ratings of Key Barriers Affecting Digital Governance in Universities

Barriers Identified	Mean ($\bar{x}$)	SD	Interpretation
Inadequate ICT infrastructure	4.12	0.81	Major Barrier
Poor internet connectivity	4.05	0.88	Major Barrier
Insufficient staff ICT skills	4.02	0.85	Major Barrier
Lack of technical support & maintenance	3.95	0.89	Major Barrier
Resistance to change	3.65	0.92	Moderate Barrier
Insufficient funding	4.08	0.87	Major Barrier
Overall Mean	3.98		Major Barriers Identified

Table 6 presents the mean ratings of the key barriers affecting digital governance and its relationship with administrative efficiency. Respondents identified inadequate ICT infrastructure ($\bar{x} = 4.12$), poor internet connectivity ($\bar{x} = 4.05$), insufficient staff ICT skills ($\bar{x} = 4.02$), lack of technical support ($\bar{x} = 3.95$), and insufficient funding ($\bar{x} = 4.08$) as major barriers. Resistance to change was also noted as a moderate barrier ($\bar{x} = 3.65$). The overall mean of 3.98 indicates that these barriers are significant and must be addressed to fully leverage ICT adoption for improved administrative efficiency.

H_{03}: There are no significant challenges that negatively affect the successful adoption of ICT tools in university management systems.

To test this hypothesis, descriptive analysis and factor loadings were used, followed by inferential test results. The barriers identified with high mean ratings were further tested to check if they significantly affect ICT adoption.

Table 7: Summary of Barriers Affecting ICT Adoption

Identified Barriers	Mean	p-value	Decision
Inadequate ICT Infrastructure	4.12	0.002	Reject H_{03} (Significant)

Poor Internet Connectivity	4.05	0.005	Reject Ho3 (Significant)
Insufficient Staff ICT Skills	4.02	0.007	Reject Ho3 (Significant)
Lack of Technical Support & Maintenance	3.95	0.003	Reject Ho3 (Significant)
Resistance to Change	3.65	0.021	Reject Ho3 (Significant)
Insufficient Funding	4.08	0.004	Reject Ho3 (Significant)

Table 7 indicates that all identified barriers had mean ratings above 3.50 and were statistically significant ($p < 0.05$). This means these barriers negatively and significantly affect the successful adoption of ICT tools in university administration. Therefore, the null hypothesis was rejected.

Discussion

The findings of this study provide valuable insights into the state of digital governance and its influence on administrative efficiency in university management systems in Delta State. Firstly, the study revealed that ICT tools are generally adopted at a moderate to high level across the universities investigated. Many respondents indicated that their institutions have made notable efforts to make ICT infrastructure available and to encourage its use for routine administrative tasks such as student registration, records management, and communication with stakeholders. However, the findings also showed that gaps remain in areas such as full system integration, consistent accessibility for all staff, and the provision of technical support. A probable reason for this moderate level of adoption could be that while universities recognize the value of ICT for modern administration and have invested in hardware and basic systems, the holistic planning needed to ensure interoperability of these tools and their long-term sustainability may be lacking. It is also likely that limited funding and policy inconsistencies continue to hamper full implementation. This finding supports the work of Osang, Etim, and Bassey (2020), who reported similar partial adoption patterns in Cross River State universities, where ICT facilities were available but not fully integrated into everyday processes. It also aligns with Agbo, Ikedinobi, and Agwu (2021), who found that while Nigerian universities increasingly acquire ICT tools, the full utilization of such tools for maximum administrative benefit is often constrained by inadequate support and fragmented systems.

In terms of the relationship between ICT adoption and administrative efficiency, the study confirmed that the level of ICT use is positively linked to improvements in administrative processes. Universities that reported higher levels of ICT adoption also experienced more timely processing of tasks, improved data accuracy, better communication among units, and greater responsiveness to stakeholders. A plausible explanation for this finding is that ICT tools help to automate routine tasks, reduce duplication, and minimize human errors that often slow down administrative operations. When administrative workflows are supported by reliable digital systems, staff can perform their duties more efficiently, and decision-making processes become faster and more transparent. This observation is consistent with the conclusions of Bamidele, Ogunlade, and Eze (2023), who found that universities with robust ICT integration achieved notable gains in administrative turnaround times and service delivery quality. Similarly, Suleiman and Garba (2020) established that universities that effectively adopted ICT tools recorded measurable improvements in administrative effectiveness, demonstrating that technology can transform outdated manual systems into more streamlined and responsive ones.

Another significant finding of the study was the moderating role of staff ICT training in the relationship between ICT adoption and administrative efficiency. The results showed that universities where staff received regular and relevant ICT training were more likely to translate their investments in digital tools into actual administrative improvements. This suggests that providing the right technological infrastructure is not enough; administrators must also possess the skills and confidence to use these tools effectively. One probable reason for this is that trained staff can navigate the functionalities of ICT systems more comfortably, troubleshoot basic issues, and adapt to updates or new tools with greater ease. This aligns with the observations of Abubakar and Lawal (2020), who emphasized that continuous training empowers university staff to leverage ICT tools to their fullest potential, leading to more efficient and responsive administrative systems. It is also consistent with Jiboku, Oladipo, and Nwachukwu (2023), who found that digital literacy and targeted training programs for administrative staff in Nigerian universities were critical in ensuring that ICT resources translated into improved institutional performance.

Furthermore, the study highlighted several key barriers that continue to hinder the successful adoption of digital governance in the universities studied. Among the most frequently cited challenges were inadequate ICT infrastructure, unreliable internet connectivity, insufficient technical support, a lack of regular training for administrative staff, resistance to change among some staff, and limited funding to maintain and upgrade existing systems. These barriers indicate that despite notable progress, systemic issues remain that can weaken the impact of ICT investments. A probable explanation for this persistence of barriers is that universities often face competing budget priorities, and ICT maintenance and capacity-building may not always receive sustained funding. Additionally, cultural and organizational resistance to changing long-standing manual processes can slow down the transition to fully digital operations. These challenges are consistent with the findings of Adegoke and Adeniran (2023), who identified infrastructural gaps and poor funding as major obstacles to effective e-governance in Nigerian higher institutions. Chukwudi and Onuoha (2022) similarly reported that poor connectivity, inadequate staff ICT competence, and lack of technical support continue to limit the effective use of ICT tools for administrative purposes.

In summary, the findings of this study confirm that while Delta State universities have made commendable progress in adopting ICT tools for administrative tasks, the benefits of these tools are not yet fully realized due to gaps in integration, staff competence, and infrastructural support. The positive relationship between ICT adoption and administrative efficiency highlights

the need for sustained investment in digital tools and systems. The significant role of staff ICT training underscores the importance of regular capacity-building initiatives to empower administrative staff to maximize the benefits of technology. Finally, addressing the key barriers identified will be crucial to strengthening digital governance and ensuring that university management systems become more efficient, transparent, and capable of meeting the demands of modern higher education administration.

Conclusion

This study explored the relationship between the adoption of ICT tools and administrative efficiency within university management systems in Delta State, with a focus on the moderating effect of staff ICT training and the barriers affecting digital governance. The findings revealed that while the level of ICT tool adoption among universities is moderate to high, challenges such as inadequate infrastructure, poor internet connectivity, and limited technical support persist. The study established that higher ICT adoption is positively associated with improved administrative efficiency, and that staff ICT training plays a significant role in strengthening this relationship. It is evident that technology alone is insufficient without well-trained personnel and supportive institutional frameworks. Overall, the study concludes that bridging infrastructural gaps, sustaining capacity-building initiatives, and addressing systemic barriers are essential for achieving more efficient, responsive, and future-ready university administration in Delta State.

Recommendations

Based on the findings, the following recommendations are made:

1. University management should prioritize the full integration and interoperability of ICT tools across all administrative departments.
2. Continuous staff ICT training programs should be institutionalized to ensure administrators possess the skills needed to maximize ICT resources.
3. Universities should invest in reliable internet connectivity and regular maintenance of ICT infrastructure to sustain digital governance initiatives.
4. Policy makers and university governing councils should allocate adequate funding to support the expansion and upgrading of ICT facilities.
5. Awareness campaigns and change management strategies should be implemented to address staff resistance and foster a culture that embraces technological innovation.

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