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"INFLUENCE OF ICT ACCESS ON ACADEMIC RESEARCH PERFORMANCE IN NIGERIAN PUBLIC UNIVERSITIES"

INFLUENCE OF ICT ACCESS ON ACADEMIC RESEARCH PERFORMANCE IN NIGERIAN PUBLIC UNIVERSITIES

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Abstract

Ideally, universities are expected to function within a digitally advanced environment where adequate ICT access supports high levels of academic research performance. In such a setting, academic staff would have reliable internet connectivity, unrestricted access to digital academic resources, and sufficient ICT competencies to effectively conduct research activities. This study examined the influence of ICT access on academic research performance in Nigerian public universities. A cross-sectional survey research design was adopted, and data were collected from academic staff across selected public universities in the North-Central region of Nigeria. The sample size of 418 respondents was determined using the Taro Yamane formula, out of which 380 valid responses were analysed. Data were collected using a structured questionnaire, and reliability was established using Cronbach's Alpha, while content validity was ensured through expert review. Simple regression analysis was employed using SPSS version 27 to test the study hypotheses. The findings revealed that internet accessibility had a significant positive effect on research productivity. Access to digital academic resources was also found to significantly influence research quality, while ICT skill level significantly affected research efficiency. The study concluded that ICT access is a key determinant of academic research performance in Nigerian public universities, as improvements in digital connectivity, resource availability, and user competence collectively enhance research output, quality, and efficiency. Based on these findings, the study recommended that universities should improve internet infrastructure, expand access to digital academic resources, and provide continuous ICT training for academic staff. These measures would strengthen research performance and enhance the global competitiveness of Nigerian public universities.

Keywords: ICT access, Internet Accessibility, Digital Academic Resources, ICT Skill level, Academic Research Performance, Nigerian Public Universities.

INTRODUCTION

Globally, Information and Communication Technology (ICT) has become a fundamental catalyst for socio-economic progress, reshaping how individuals, organizations, and institutions generate, retrieve, and share information (Adewusi & Jegede, 2025). In recent decades, swift developments in digital technologies have transformed multiple sectors such as education, healthcare, finance, and public administration. Notably, embedding ICT within knowledge systems has markedly improved the efficiency, reach, and breadth of information exchange across national borders. Universities and research centers worldwide now depend

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heavily on ICT to facilitate teaching, learning, and scholarly inquiry, establishing ICT as a foundational element of contemporary academic settings (Shehu et al., 2025).

Within higher education, digital transformation has redefined academic research practices, allowing scholars to tap into extensive knowledge repositories, collaborate internationally, and apply sophisticated tools for data analysis and dissemination (Ani et al., 2015). Digital services including online databases, institutional repositories, virtual libraries, and research management platforms have become integral to modern research ecosystems. These technologies have not only hastened research timelines but also elevated the quality and visibility of scholarly outputs. Consequently, the adoption and proficient use of ICT have become essential for universities aiming to strengthen their research performance and international standing (Umar & Babalola, 2021).

ICT access denotes the availability and effective deployment of digital technologies and resources required for academic endeavors. It significantly contributes to enhanced research performance by supporting information retrieval, data handling, and scholarly communication (Ani, 2013). Researchers have outlined key dimensions of ICT access, namely internet accessibility, availability of digital academic resources, and ICT competency levels. Internet accessibility covers the availability, speed, and reliability of connectivity, which are vital for accessing online research materials and participating in academic collaboration (Apuke & Iyendo, 2018). Access to digital academic resources pertains to the availability of electronic journals, databases, and institutional repositories that supply current and relevant scholarly content. ICT skill level reflects researchers' capacity to competently use digital tools and platforms for research tasks, including data analysis software, reference management applications, and advanced online search strategies (Ani et al. 2014). Together, these dimensions are instrumental in boosting research productivity, enhancing the quality of academic outputs, and streamlining research processes.

Academic research performance serves as a critical measure of the effectiveness and productivity of higher education institutions. It captures the extent to which academic staff and researchers advance knowledge creation and dissemination through scholarly work (Adewusi & Jegede, 2025). The dimensions of academic research performance include research productivity, research quality, and research efficiency. Research productivity refers to the volume of academic outputs such as journal articles, conference proceedings, and completed research projects. Research quality relates to the standard and impact of these outputs, commonly assessed through citation metrics, journal rankings, and peer review evaluations. Research efficiency reflects the capacity to execute research activities within optimal timeframes while making effective use of available resources (Umar & Babalola, 2021). These dimensions collectively shape the overall research standing and reputation of universities.

The connection between ICT access and academic research performance in Nigerian public universities represents a significant area for scholarly examination. Although ICT holds considerable promise for enhancing research activities, the extent to which this potential is actualized may depend on the level of access to digital infrastructure, the availability of resources, and the competencies of academic staff (Shehu et al., 2025). Within Nigerian public universities, where infrastructural and resource limitations are common, the interplay between ICT access and research performance may be intricate and multidimensional. It is reasonable to propose that improved ICT access could yield better research outcomes, yet the magnitude and nature of this relationship warrant empirical exploration (Ani et al., 2015).

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Despite widespread acknowledgment of ICT's importance in academic research, numerous Nigerian public universities continue to encounter challenges associated with limited ICT access. Reported issues include inadequate internet connectivity, insufficient access to digital academic resources, and low levels of ICT proficiency among academic staff (Bieniose& Patience, 2025). These constraints may impede researchers' ability to engage effectively in scholarly activities, thereby affecting research productivity, quality, and efficiency. As a result, the inability to fully leverage ICT resources may contribute to the relatively modest research output and global positioning of Nigerian universities (Ani, 2013).

In light of these challenges, it is essential to investigate the influence of ICT access on academic research performance in Nigerian public universities. Understanding this relationship is crucial for guiding policy formulation, refining institutional strategies, and strengthening the overall research capacity of universities. This study is therefore necessary to generate empirical evidence on how different dimensions of ICT access affect research performance, thereby supporting the development of more targeted interventions aimed at advancing academic research in Nigeria.

Statement of the Problem

Ideally, universities are expected to function within a digitally advanced environment where adequate ICT access supports high levels of academic research performance. In such a setting, academic staff would have reliable internet connectivity, unrestricted access to digital academic resources, and sufficient ICT competencies to effectively conduct research activities. These conditions would enhance research productivity, improve the quality of scholarly outputs, and promote efficiency in research processes. Studies have shown that institutions with strong ICT integration tend to achieve higher research output and contribute significantly to knowledge development and national economic growth (Watsilla & Vajjhala, 2020; Adewusi & Jegede, 2025). Furthermore, effective use of internet resources has been linked to improved academic engagement and research outcomes (Apuke & Iyendo, 2018).

However, this ideal situation has not been fully achieved in Nigerian public universities. Evidence suggested that many institutions continued to face significant challenges related to ICT access, including unreliable internet connectivity, inadequate ICT infrastructure, and limited access to digital academic resources. Previous studies reported that poor accessibility and underutilization of electronic information resources have negatively affected the productivity of academic staff in Nigerian universities (Ani et al., 2014; Ani et al., 2015). In addition, disparities in ICT infrastructure and access to digital platforms have persisted, creating gaps in knowledge sharing and academic collaboration (Shehu et al., 2025). These challenges have contributed to low research output and reduced global visibility of Nigerian universities when compared to institutions in more technologically advanced environments (Elizabeth & Uwem, 2016). Moreover, limited ICT usage has continued to constrain research productivity among academic staff, thereby affecting overall institutional performance (Umar & Babalola, 2021).

Beyond these practical concerns, there remained notable theoretical gaps in the existing literature regarding the specific influence of ICT access on academic research performance within the Nigerian context. While prior studies have emphasized the importance of ICT in education and research, there has been limited empirical evidence examining how key dimensions of ICT access such as internet accessibility, access to digital academic resources, and ICT skill level interact to influence research productivity, quality, and efficiency

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simultaneously. This gap has created a need for a more integrated approach to understanding the role of ICT access in enhancing research performance in public universities.

If these challenges are not adequately addressed, several negative consequences are likely to persist. Nigerian public universities may continue to experience low research productivity, reduced global competitiveness, and limited contribution to innovation and knowledge creation. Academic staff may also face constraints in producing high quality research, which could affect career progression and institutional reputation. Additionally, the inability to effectively leverage ICT resources could hinder national development, given the critical role universities play in advancing knowledge and supporting socio-economic growth. It therefore became necessary to examine the influence of ICT access on academic research performance in Nigerian public universities in order to provide empirical insights that could inform policy formulation and institutional strategies aimed at improving research outcomes.

Research Questions

i. How does internet accessibility influence research productivity in Nigerian public universities?
ii. To what extent does access to digital academic resources affect research quality in Nigerian public universities?
iii. How does ICT skill level impact research efficiency in Nigerian public universities?

Research Objectives

The main objective was to examine the influence of ICT access on academic research performance in Nigerian public universities. The specific objectives are to:

i. Determine the effect of internet accessibility on research productivity in Nigerian public universities.
ii. Explore the effect of access to digital academic resources on research quality in Nigerian public universities.
iii. Evaluate the influence of ICT skill level on research efficiencyin Nigerian public universities.

Research Hypotheses

H_{01}: Internet accessibility has no significant effect on research productivity in Nigerian public universities.

H_{02}: Access to digital academic resources has no significant effect on research quality in Nigerian public universities.

H_{03}: ICT skill level has no significant effect on research efficiency in Nigerian public universities.

LITERATURE REVIEW

Conceptual Review

ICT Access

Information and Communication Technology (ICT) access is commonly viewed as a multidimensional concept that goes beyond the mere possession of digital devices to include the availability of infrastructure, reliable connectivity, access to relevant digital content, and

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the capacity of users to effectively utilize these resources. This perspective emphasizes that meaningful access involves not only physical availability but also the ability to engage with digital tools for academic purposes (Phon & Ali, 2025; Chowdhury et al., 2025). In developing countries such as Nigeria, inequalities in ICT access have continued to affect the performance of higher education institutions by limiting both access to essential resources and the development of digital competencies among academic staff and students (Ferede et al., 2021; Remache & Belarbi, 2019). Evidence from related contexts suggests that while infrastructural availability is important, users' ability to effectively apply ICT tools plays a more significant role in determining academic outcomes and overall educational quality (Phon & Ali, 2025; Loh et al., 2023).

Despite the growing integration of ICT in higher education, its application often remains limited to conventional instructional methods, with minimal transformation in teaching and research practices. This limitation reduces the potential benefits of ICT in enhancing academic performance (Ferede et al., 2022). Furthermore, challenges such as inadequate infrastructure, weak institutional support systems, and insufficient digital skills continue to widen existing gaps in ICT utilization, particularly in developing regions (Karamti, 2016; Chowdhury et al., 2025). These issues constrain the effective use of digital technologies for research and learning. Addressing these challenges requires a comprehensive approach that combines investment in ICT infrastructure with deliberate efforts to strengthen user competence through training and policy interventions. Such measures are essential for maximizing the benefits of ICT and improving academic performance in higher education institutions (Remache & Belarbi, 2019).

Internet Accessibility

Internet accessibility represents a fundamental dimension of ICT access, referring to the availability, affordability, and reliability of internet services for users. In academic environments, internet accessibility plays a crucial role in facilitating access to scholarly information, communication with peers, and participation in global research networks. The internet serves as a gateway to vast repositories of knowledge, enabling researchers to retrieve relevant literature, access online databases, and share research findings across borders (Castells, 2010).

The level of internet accessibility available to academic staff can significantly influence their research activities. Reliable and high-speed internet connectivity allows researchers to conduct literature reviews efficiently, download large datasets, and engage in virtual collaborations. Conversely, poor internet access can hinder research progress, delay project timelines, and limit exposure to current academic developments. In the Nigerian context, challenges such as unstable network connections, limited bandwidth, and high cost of internet services have been widely reported, thereby affecting the research productivity of academic staff (Adomi & Kpangban, 2010). This highlights the importance of improving internet accessibility as a means of enhancing academic research performance.

Access to Digital Academic Resources

Access to digital academic resources refers to the availability and utilization of electronic scholarly materials such as online journals, academic databases, e-books, and institutional repositories. These resources are essential for conducting high-quality research, as they provide researchers with access to current and credible information. The transition from traditional print-based resources to digital platforms has significantly transformed the

research landscape, enabling faster and more efficient access to scholarly content (Tenopir et al., 2017).

The availability of digital academic resources has been linked to improved research quality and innovation. Researchers who have access to reputable databases such as Scopus, Web of Science, and ScienceDirect are more likely to produce well-informed and impactful studies. However, access to these resources often depends on institutional subscriptions and funding, which may be limited in many Nigerian public universities. As a result, academic staff may face challenges in accessing up-to-date literature, thereby affecting the depth and quality of their research outputs (Ani et al., 2015). Enhancing access to digital academic resources is therefore critical for improving research outcomes in higher education institutions.

ICT Skill Level

ICT skill level refers to the ability of individuals to effectively use digital technologies for academic and research purposes. These skills include the ability to search for information online, use data analysis software, manage digital references, and communicate through online platforms. Digital competence has been identified as a key factor in determining how effectively ICT resources are utilized in academic environments (Van Dijk, 2013).

In the context of research, ICT skills are essential for improving both the efficiency and effectiveness of scholarly activities. Researchers with strong ICT competencies are better equipped to analyze complex data, utilize advanced research tools, and disseminate their findings through digital platforms. On the other hand, limited ICT skills can lead to underutilization of available technologies and reduced research productivity. In Nigerian public universities, gaps in ICT skills among academic staff have been identified as a significant challenge, often resulting in inefficient research processes and limited engagement with digital resources (Jegede, 2009). This underscores the need for continuous training and capacity development in ICT skills.

Academic Research Performance

Academic research performance is a key indicator of the effectiveness of higher education institutions in fulfilling their mandate of knowledge creation and dissemination. It refers to the extent to which academic staff contribute to scholarly output through research activities. This concept is often assessed using indicators such as publication output, citation impact, and the timeliness of research completion (Altbach & Salmi, 2011).

The importance of research performance extends beyond individual achievement to institutional reputation and national development. Universities with strong research performance are better positioned to attract funding, establish international collaborations, and contribute to innovation. In Nigeria, however, many public universities have struggled to achieve high levels of research performance due to various constraints, including limited ICT access. Addressing these challenges is essential for improving the global competitiveness of Nigerian universities.

Research Productivity

Research productivity refers to the quantity of scholarly outputs produced by academic staff over a given period. These outputs may include journal articles, conference papers, books,

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and research reports. Research productivity is often used as a measure of academic performance and institutional effectiveness (Bland et al., 2005).

Several factors influence research productivity, including access to resources, institutional support, and individual motivation. ICT access has been identified as a critical factor that can enhance research productivity by facilitating access to information, improving communication, and enabling efficient data analysis. In Nigerian public universities, low research productivity has been linked to inadequate ICT infrastructure and limited access to digital resources (Ogunyade & Oyibo, 2017). Improving ICT access is therefore essential for increasing research output among academic staff.

Research Quality

Research quality refers to the standard and impact of academic outputs. It is commonly evaluated using metrics such as citation counts, journal rankings, and peer review assessments. High-quality research contributes to the advancement of knowledge and enhances the credibility of academic institutions (Moed, 2005).

Access to ICT plays a significant role in determining research quality. Researchers who can access current and relevant literature are more likely to produce innovative and impactful studies. Additionally, the use of advanced digital tools can improve the rigor and accuracy of research findings. In contexts where ICT access is limited, researchers may struggle to produce high-quality outputs, thereby affecting their academic reputation and career progression. Enhancing ICT access is therefore crucial for improving research quality in Nigerian public universities.

Research Efficiency

Research efficiency refers to the ability to complete research activities within a reasonable timeframe while making optimal use of available resources. It involves minimizing delays and maximizing productivity through effective use of tools and processes (Drucker, 1999).

ICT tools such as data analysis software, reference management systems, and online collaboration platforms have significantly improved research efficiency. These tools enable researchers to streamline their work processes, reduce errors, and complete tasks more quickly. However, in environments where ICT access is limited, research efficiency may be compromised due to delays in accessing information and limited use of digital tools. In Nigerian public universities, improving ICT access can help enhance research efficiency and overall academic performance.

Theoretical Framework

This study was anchored on the Technology Acceptance Model (TAM), developed by Davis (1989). The model explains how individuals come to accept and use new technologies, emphasizing two key constructs: perceived usefulness and perceived ease of use. According to Davis (1989), individuals are more likely to adopt a technology if they believe it will enhance their performance and is easy to use.

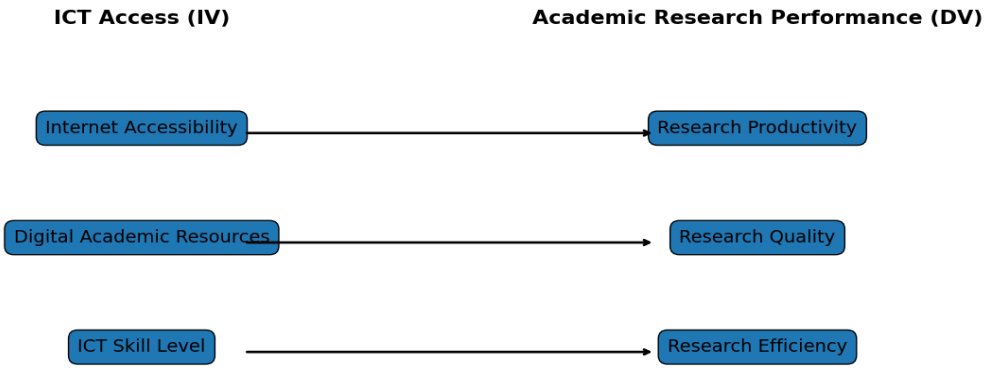
The core assumption of TAM is that users' attitudes toward technology are shaped by their perceptions of its usefulness and ease of use, which in turn influence their intention to use and actual usage behavior. In the context of ICT access, this implies that academic staff are

more likely to utilize digital technologies for research if they perceive them as beneficial and user-friendly.

Despite its widespread application, TAM has faced criticism for its limited consideration of external factors such as organizational support, infrastructure, and socio-economic conditions. Critics argue that the model may oversimplify the complexities of technology adoption, particularly in developing countries where contextual factors play a significant role (Venkatesh et al., 2003). However, the strength of TAM lies in its simplicity and strong predictive power, making it a widely used framework in technology adoption studies.

The relevance of TAM to this study lies in its ability to explain how ICT access influences academic research performance. By focusing on the perceptions and usage of ICT tools among academic staff, the model provides a useful framework for understanding how internet accessibility, digital resources, and ICT skills can enhance research productivity, quality, and efficiency. In the context of Nigerian public universities, TAM offers valuable insights into how improving ICT access can lead to better research outcomes and overall academic performance.

Conceptual Model



Source: Researcher, 2026

The conceptual model illustrated the relationship between ICT access and academic research performance in Nigerian public universities. ICT access was treated as the independent variable and was represented through three key components: internet accessibility, access to digital academic resources, and ICT skill level. Each of these components was linked to a specific dimension of academic research performance, which served as the dependent variable. Internet accessibility was expected to influence research productivity by enabling timely access to information and facilitating communication among researchers. Access to digital academic resources was associated with research quality, as it provided scholars with current and credible literature necessary for producing rigorous and impactful studies. ICT skill level was linked to research efficiency, reflecting the ability of researchers to effectively use digital tools to complete research tasks within shorter timeframes. In all, the model

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suggested that improvements in ICT access could enhance different aspects of research performance, thereby contributing to better academic outcomes in public universities.

Empirical Review

Abubakar and Akor (2017) investigated the availability and utilization of electronic information databases for research among agricultural scientists in federal universities in North Central Nigeria. The study employed a survey research design, targeting a population of 415 agricultural scientists distributed across various faculties of agriculture, and selected a sample size of 195 respondents through stratified sampling. Data were collected using questionnaires and documentary records, and subsequently analyzed with the Statistical Package for the Social Sciences (SPSS) utilizing frequency distribution tables, percentages, means, and standard deviations. The findings revealed that all sampled scientists subscribed to online databases, with a high proportion utilizing them frequently for research, knowledge updating, and current awareness; additionally, 74% of respondents reported that electronic information significantly enhanced the quantity and quality of their publications while mitigating geographical barriers to information access, reflecting overall satisfaction with the services. However, a gap was identified in the study's limited geographic and disciplinary scope, alongside insufficient promotional efforts, as the authors noted that greater publicity was required to ensure broader awareness and utilization of the available digital resources.

Eze et al. (2018) examined the adoption and utilization of e-learning facilities by lecturers within a Nigerian private tertiary institution. The research adopted a qualitative research design, focusing on the academic staff of M-University as the population and selecting a sample size of 15 lecturers. Data were gathered through semi-structured interviews and analyzed using a data-driven thematic approach comparable to grounded theory. The findings indicated that the institution's e-learning facilities were both adequate and accessible, with most lecturers expressing comfort in integrating them into classroom instruction compared to their public university counterparts; nevertheless, full utilization remained constrained by negative user attitudes, inadequate internet infrastructure, and insufficient staff training. A clear gap was identified in the study's narrow institutional focus, as the confinement to a single private university limited the generalizability of the results to public tertiary institutions and highlighted the need for broader, multi-institutional investigations into systemic barriers to e-learning adoption.

Shonhe (2020) sought to provide a descriptive assessment of research productivity concerning the Continuous Professional Development (CPD) of librarians. The study utilized a bibliometric research design, drawing from a population of scholarly publications indexed in the Web of Science (WoS) core collection, with a final sample size of 77 records selected after abstract screening from an initial retrieval of 165. Data were sourced exclusively from WoS and analyzed using the statistical software R (Biblioshiny) and VOSviewer for data visualization. The findings demonstrated that the United States, the United Kingdom, and Australia were the most prolific countries in this research domain, with Nigeria and South Africa leading in Africa, while the University of Nigeria and the University of Sheffield emerged as the most productive institutions; publication peaks occurred in 2009 and 2013, with Library Trends and the Journal of Librarianship & Information Science serving as the primary outlets, and E. Hornung, G. Hallam, and S. Lewis identified as the most prolific authors. Despite these outputs, a significant gap was identified in the critically low citation impact and overall research activity, particularly within developing regions, as well as a pronounced absence of CPD studies focusing on public and school libraries, underscoring the

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urgent need for expanded scholarly output to inform evidence-based library workforce development.

Arumuru and David (2024) explored the intricate relationship between instructional resources, teaching quality, and academic achievement among Library and Information Science postgraduates in Nigeria. The study employed a survey research design, targeting Library and Information Science postgraduate students across multiple Nigerian universities as the population, and selected a sample size of 185 respondents. Data were collected using a self-structured questionnaire designed to assess the availability and perceived use of instructional resources, and subsequently analyzed using descriptive and inferential statistical techniques. The findings revealed that while certain resources such as ICT facilities and reference materials were moderately accessible, the overall availability of instructional resources remained concerning; however, a positive correlation was established between resource availability and academic performance, suggesting that well-equipped learning environments significantly influenced student success. Despite these contributions, a gap was identified in the study's disciplinary and geographical confinement to Library and Information Science postgraduates in Nigeria, which limited the generalizability of findings to other academic disciplines or educational contexts, alongside reliance on self-reported data that may have introduced response bias.

Idhalama et al. (2025) assessed the availability and accessibility of digital resources and services in public university libraries in Nigeria. The study adopted a literature synthesis research design, drawing from existing scholarly publications and reports pertaining to digital library initiatives in Nigerian public universities as the source population, without specifying a discrete sample size. Data were collected through systematic review and synthesis of secondary literature, and analyzed using thematic and narrative analytical approaches to establish patterns and challenges. The findings portrayed a mixed picture of digital resource provision, whereby some libraries demonstrated commitment to improving digitization services, while infrastructural deficits, funding challenges, and limited user awareness constrained full utilization in most institutions. A notable gap in the study was its reliance on secondary literature rather than primary empirical data collection, which limited the depth of contextual insights and the ability to capture real-time user experiences or quantify accessibility metrics across diverse library settings.

Abbas and Song (2020) investigated the level of accessibility and utilization of electronic information resources for research activities in Agricultural Research Institutes in Kaduna State, Nigeria. The study adopted a descriptive cross-sectional survey research design, targeting a population of 373 research scientists across IAR, NAPRI, and NAERLS, and selected a sample size of 187 respondents using the Israel and Glenn (2003) sampling table. Data were collected through structured questionnaires and analyzed using both descriptive statistics and inferential techniques, including regression analysis, within the theoretical framework of the Unified Theory of Acceptance and Use of Information Technology (UTAUT) model. The findings revealed a high level of accessibility to electronic information resources and a high extent of utilization for research activities, with researchers accessing relevant EIRs through institutional library passwords and Agricultural CD-ROMs; furthermore, regression analysis confirmed a statistically significant correlation between accessibility and utilization ($r=0.763$, $p<0.031$), supporting the conclusion that enhanced access significantly improved research outcomes. However, a gap was identified in the study's geographical and institutional scope, as the confinement to Agricultural Research

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Institutes in Kaduna State limited the applicability of findings to other states, research domains, or non-agricultural institutions, while reliance on self-reported utilization data may have introduced social desirability bias.

Shomoye et al. (2023) investigated the use of electronic resources for undergraduate learning at the National Open University of Nigeria in Kwara State. The study employed a survey research design, targeting all undergraduates enrolled at NOUN in Kwara State as the population, and determined the sample size using the Israel Model for proportional allocation across study centers. Data were collected using a modified questionnaire with established psychometric properties, and analyzed using descriptive and inferential statistics via the Statistical Package for the Social Sciences (SPSS) version 20.0 at a 0.05 significance level. The findings indicated that undergraduate students interacted effectively with electronic learning resources, and no statistically significant differences in e-resource usage were detected based on gender or digital age, suggesting that properly deployed learning tools could considerably enhance the undergraduate learning experience. Despite these insights, a gap was identified in the study's institutional and geographical confinement to a single open university in Kwara State, which limited the generalizability of findings to conventional universities, other geopolitical zones, or diverse educational delivery models, while the cross-sectional design precluded longitudinal assessment of e-resource adoption patterns over time.

Oyovwe-Tinuoye et al. (2021) examined the influence of information and communication technology (ICT) skills on job performance among librarians in university libraries in South-South, Nigeria. The study adopted a descriptive survey research design, targeting a population of 233 librarians across six federal, seven state, and eight private university libraries in the region, and employed a purposive sampling technique to select respondents. Data were collected using a self-constructed questionnaire developed after consulting related literature to ensure content validity, and subsequently analyzed using frequency distributions, percentages, and tables for interpretative clarity. The findings revealed that the majority of respondents acquired ICT skills through self-sponsorship, and many lacked proficiency in advanced competencies such as system troubleshooting, webinar tools, Web 2.0 applications, website design, and digital communication; furthermore, the absence of institutional policies regulating ICT training meant most librarians had not attended formal training in the preceding five years, though evidence indicated that ICT skill development significantly enhanced service delivery, administrative efficiency, job performance, and reduced occupational stress. Despite these contributions, a gap was identified in the study's reliance on self-reported data and its geographical confinement to South-South Nigeria, which limited the generalizability of findings to other geopolitical zones and highlighted the need for longitudinal or experimental designs to establish causal relationships between ICT training interventions and measurable job performance outcomes.

Odefunsho et al. (2022) investigated lecturers' efficacy and readiness towards the utilization of information and communication technology for academic research in Colleges of Education in Kwara State, Nigeria. The study employed a non-experimental descriptive survey research design, targeting all lecturers in two case-study institutions Kwara State College of Education, Ilorin, and Kwara State College of Arabic and Islamic Legal Studies, Ilorin with a sample size of 140 academic staff determined using the Krejcie and Morgan (1970) table. Data were collected using a structured questionnaire titled "Lecturers' Efficacy and Readiness towards Utilization of ICT Questionnaire" (LERUQ), which underwent expert validation by specialists in Science Education, Test Measurement and Evaluation, and ICT,

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and analyzed using descriptive statistics (frequency and percentage) for research questions and Pearson Product Moment Correlation (PPMC) at a 0.05 significance level for hypothesis testing. The findings indicated that while most lecturers expressed positive attitudes towards ICT utilization for research, their actual knowledge and understanding of relevant digital tools remained limited, suggesting a disconnect between perceived readiness and practical competency. A notable gap in the study was its narrow institutional focus on only two Colleges of Education within a single state, which constrained the external validity of the results and underscored the necessity for broader, multi-state investigations incorporating observational or performance-based measures to complement self-reported readiness assessments.

Babalola and Umar (2021) explored the influence of information literacy skills on the research productivity of academic staff in federal universities in North-eastern Nigeria. The study adopted a survey research design, targeting a population of 4,258 academic staff across six federal universities in the region, from which a sample of 366 respondents was drawn using a multi-stage sampling technique involving simple random selection of three universities followed by stratified sampling of four common faculties (Education, Science, Agriculture, and Social Sciences). Data were collected through questionnaires and analyzed using percentages, means, and standard deviations to address the research objectives. The findings revealed that information literacy skills exerted no statistically significant effect on the research productivity of academic staff, implying that the level of information literacy possessed by lecturers did not necessarily determine their scholarly output in the studied context. However, a critical gap was identified in the study's reliance on cross-sectional data and self-reported productivity metrics, which may have obscured nuanced relationships between specific information literacy competencies and distinct dimensions of research output; additionally, the exclusion of contextual variables such as institutional support, access to digital resources, and disciplinary differences limited the depth of explanatory insight and suggested the need for mixed-methods approaches to capture the complex interplay of factors influencing research productivity.

Asaju and Ogar (2022) examined the perceptions of exam officers towards the adoption of information and communication technology in collating students' results and its implications for academic excellence at Federal University Wukari, Taraba State, Nigeria. The study employed a survey research design utilizing both primary and secondary data sources, with questionnaires administered to exam officers as the primary instrument for quantitative data collection, while qualitative insights were gathered through documentary analysis and open-ended responses. Data were analyzed using quantitative techniques for questionnaire responses and content analysis for qualitative inputs to provide a comprehensive assessment of ICT adoption experiences. The findings revealed that exam officers felt inadequately informed and unprepared for the sudden, management-driven implementation of ICT-based result collation; nevertheless, they unanimously acknowledged that ICT adoption had positively impacted the accuracy, consistency, and efficiency of student result processing, thereby enhancing academic evaluation processes and contributing to improved student academic outcomes, despite initial challenges related to training deficits and infrastructural limitations. A significant gap identified in the study was its single-institution case study design, which limited the transferability of findings to other Nigerian universities with varying ICT maturity levels, administrative cultures, or resource allocations; furthermore, the absence of pre- and post-implementation comparative data constrained the ability to quantify

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the precise magnitude of ICT's impact on academic excellence, highlighting the need for longitudinal or quasi-experimental designs in future research.

METHODOLOGY

This section presented the procedures that were adopted in examining the influence of ICT access on academic research performance in Nigerian public universities. It described the research design, population of the study, sampling technique, sample size determination, method of data collection, as well as the procedures for ensuring validity, reliability, and data analysis.

Research Design

The study adopted a cross-sectional survey research design. This design was considered appropriate because it enabled the collection of data from respondents at a single point in time without manipulating any of the study variables. It was suitable for this study as it allowed for the assessment of the relationship between ICT access and academic research performance among academic staff. The design also supported the use of quantitative methods, making it possible to generalize findings across the selected universities.

Study Population

The population of the study comprised academic staff of public universities located in the North-Central region of Nigeria. These universities included Benue State University, University of Agriculture Makurdi, Ibrahim Badamasi Babangida University Lapai, Federal University of Technology Minna, Nasarawa State University Keffi, Federal University Lafia, Plateau State University Bokkos, University of Jos, Kogi State University Anyigba, Federal University Lokoja, Kwara State University, University of Ilorin, and University of Abuja. Information obtained from institutional records indicated that the total population of academic staff across these universities was 7,745.

The unit of analysis for the study was the academic staff of the selected universities. This was justified on the basis that academic staff are directly involved in research activities and are primary users of ICT tools such as internet services, digital databases, and research software. As such, they were in the best position to provide reliable information regarding ICT access and its influence on academic research performance.

Sample Size

The sample size for the study was determined using the Taro Yamane (1967) formula, which is expressed as $n = \frac{N}{1+N(e^2)}$, where n represents the sample size, N represents the population size, and e represents the level of precision. Using a population size of 7,745 and a precision level of 0.05, the sample size was calculated as follows: $n = \frac{7745}{1+7745(0.05^2)}$. This resulted in $n = \frac{7745}{1+7745(0.0025)} = \frac{7745}{20.3625}$, which gave an approximate sample size of 380 respondents.

To account for possible non-response, incomplete questionnaires, or data loss, a 10% margin of safety was added to the calculated sample size. This was computed as 10% of 380, which is 38. Therefore, the adjusted sample size became 418 respondents (380 + 38). The inclusion of this margin of safety ensured that sufficient data would be obtained even in the event of non-response, thereby enhancing the reliability and representativeness of the study.

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Sampling Techniques

A stratified random sampling technique was employed in selecting respondents for the study. This technique was considered appropriate because it ensured adequate representation of all the universities included in the study. Each university was treated as a stratum, and the sample size was proportionally allocated based on the size of academic staff in each institution. The proportionate allocation formula was applied as follows: Sample size for each stratum = (population of each university / total population) × total sample size.

Based on this approach, the sample sizes were distributed across the universities as follows: Benue State University (23), University of Agriculture Makurdi (37), Ibrahim Badamasi Babangida University Lapai (12), Federal University of Technology Minna (41), Nasarawa State University Keffi (27), Federal University Lafia (13), Plateau State University Bokkos (8), University of Jos (67), Kogi State University Anyigba (17), Federal University Lokoja (9), Kwara State University (21), University of Ilorin (73), and University of Abuja (32). This proportional distribution ensured that each university was fairly represented in the study.

Method of Data Collection

The study relied on primary data, which were collected through the use of a structured questionnaire. The questionnaire was designed to obtain information on ICT access and academic research performance. It consisted of closed-ended questions measured on a Likert scale, allowing respondents to indicate their level of agreement with various statements. This method was considered suitable because it facilitated the collection of standardized data from a large number of respondents within a short period.

Validity of the Research Instrument

The validity of the instrument was established using content validity. This involved subjecting the questionnaire to expert review by specialists in information systems and educational research. The experts assessed the relevance and clarity of the items, and their suggestions were incorporated into the final version of the instrument to ensure that it adequately measured the study variables.

Reliability of the Research Instrument

The reliability of the instrument was determined using Cronbach's Alpha coefficient to assess the internal consistency of the questionnaire items. The results indicated acceptable reliability values above the recommended threshold of 0.70. Specifically, ICT access had a coefficient of 0.81, internet accessibility had 0.79, digital academic resources had 0.83, ICT skill level had 0.80, research productivity had 0.84, research quality had 0.82, and research efficiency had 0.78. These values confirmed that the instrument was reliable for the study.

Method of Data Analysis

Data collected from the field were analyzed using inferential statistics through simple regression analysis with the aid of the Statistical Package for Social Sciences (SPSS) version 27. Simple regression was considered appropriate because it enabled the examination of the effect of each independent variable on its corresponding dependent variable separately. This approach aligned with the specific objectives of the study, which focused on assessing the individual influence of internet accessibility on research productivity, access to digital academic resources on research quality, and ICT skill level on research efficiency.

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The model specification for the study was expressed in functional form as:

Academic Research Performance = f (ICT Access)

This was further decomposed into three simple regression models as follows:

$RP = \beta_0 + \beta_1 IA + \varepsilon$

$RQ = \beta_0 + \beta_1 DR + \varepsilon$

$RE = \beta_0 + \beta_1 IS + \varepsilon$

Where:

RP = Research Productivity

RQ = Research Quality

RE = Research Efficiency

IA = Internet Accessibility

DR = Digital Academic Resources

IS = ICT Skill Level

β_0 = Constant term

β_1 = Regression coefficient

ε = Error term

These models were used to examine the extent to which each dimension of ICT access influenced the corresponding dimension of academic research performance.

RESULTS AND DISCUSSION

Response Rate

Questionnaire Distributed	418
Returned Questionnaire	380
Percentage of returned Questionnaire	91%
Unreturned Questionnaire	38
Percentage of not returned Questionnaire	9%

Source: Field Survey, (2026)

A total of 418 questionnaires were distributed to respondents across the selected universities, out of which 380 were successfully completed and returned, representing a response rate of 91 percent. This high rate of return indicated a strong level of participation and interest among the respondents in the subject matter of the study. However, 38 questionnaires, accounting for 9 percent, were not returned, which may have been due to factors such as time constraints, non-availability of respondents, or lack of interest. Despite this, the response rate was considered adequate for statistical analysis and provided a reliable basis for drawing valid conclusions in the study.

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Test of Hypotheses

Test of Hypothesis One

H_{01}: Internet accessibility has no significant effect on research productivity in Nigerian public universities.

Model 1

$RP = \beta_0 + \beta_1 IA + \varepsilon$

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.603[a]	.364	.362	.41194

a. Predictors: (Constant), IA

Source: SPSS Output Version 27.0

The model summary results indicated that internet accessibility (IA) had a moderate relationship with research productivity, as reflected by the correlation coefficient (R) of 0.603. The coefficient of determination (R^2) was 0.364, which implied that approximately 36.4% of the variation in research productivity was explained by internet accessibility. The adjusted R^2 value of 0.362 further confirmed that the model maintained a good level of explanatory power even after adjusting for potential bias. Additionally, the standard error of the estimate was 0.41194, suggesting a relatively low level of prediction error and indicating that the model provided a reasonably accurate fit to the data. Overall, the results suggested that internet accessibility contributed meaningfully to explaining variations in research productivity among the respondents.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.676	1	36.676	216.133	.000[b]
	Residual	64.143	378	.170		
	Total	100.819	379			

a. Dependent Variable: RP
b. Predictors: (Constant), IA

Source: SPSS Output Version 27.0

The ANOVA results showed that the regression model was statistically significant in explaining the relationship between internet accessibility and research productivity. The model produced a regression sum of squares of 36.676 with 1 degree of freedom and a mean square value of 36.676, while the residual sum of squares was 64.143 with 378 degrees of freedom and a mean square of 0.170. The F-statistic was 216.133 with a significance level of 0.000, which was less than the conventional threshold of 0.05. This indicated that the model was a good fit and that internet accessibility had a statistically significant effect on research productivity. Therefore, the null hypothesis was rejected, suggesting that internet accessibility significantly influenced research productivity among the respondents.

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Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.123	.150		14.152	.000
	IA	.559	.038	.603	14.701	.000

a. Dependent Variable: RP

Source: SPSS Output Version 27.0

The coefficient results indicated that internet accessibility had a positive and statistically significant effect on research productivity. The constant term had a value of 2.123, suggesting that when internet accessibility was held constant, research productivity would still maintain a baseline level. The unstandardized coefficient for internet accessibility was 0.559, implying that a unit increase in internet accessibility led to a corresponding increase of 0.559 in research productivity. The standardized beta value of 0.603 further showed that internet accessibility had a moderately strong influence on research productivity. In addition, the t-value of 14.701 with a significance level of 0.000 indicated that the effect was statistically significant at the 5 percent level. This result suggested that internet accessibility was an important predictor of research productivity among the respondents.

Test of Hypothesis Two

H_{02}: Access to digital academic resources has no significant effect on research quality in Nigerian public universities.

Model 2

$RQ = \beta_0 + \beta_1 DR + \varepsilon$

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716[a]	.512	.511	.35553

a. Predictors: (Constant), DR

Source: SPSS Output Version 27.0

The model summary results indicated that access to digital academic resources (DR) had a strong positive relationship with research quality, as evidenced by the correlation coefficient (R) of 0.716. The coefficient of determination (R^2) was 0.512, which showed that approximately 51.2% of the variation in research quality was explained by access to digital academic resources. The adjusted R^2 value of 0.511 further confirmed the robustness of the model after accounting for potential bias. Additionally, the standard error of the estimate was 0.35553, indicating a relatively low level of prediction error and suggesting that the model provided a good fit to the data. Overall, the findings implied that access to digital academic resources played a significant role in explaining variations in research quality among the respondents.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.212	1	50.212	397.238	.000[b]
	Residual	47.780	378	.126		
	Total	97.992	379			

a. Dependent Variable: RQ
b. Predictors: (Constant), DR

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Source: SPSS Output Version 27.0

The ANOVA results revealed that the regression model examining the effect of access to digital academic resources on research quality was statistically significant. The regression sum of squares was 50.212 with 1 degree of freedom, while the residual sum of squares was 47.780 with 378 degrees of freedom, indicating the portion of variance not explained by the model. The mean square values for regression and residual were 50.212 and 0.126 respectively. The computed F-statistic was 397.238 with a significance value of 0.000, which was well below the 0.05 threshold. This indicated that the model provided a good fit to the data and that access to digital academic resources significantly influenced research quality. Consequently, the null hypothesis was rejected, confirming that digital resource access had a meaningful impact on research quality among the respondents.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.496	.128		11.687	.000
	DR	.630	.032	.716	19.931	.000

a. Dependent Variable: RQ

Source: SPSS Output Version 27.0

The coefficient results showed that access to digital academic resources had a positive and statistically significant effect on research quality. The constant value of 1.496 indicated the baseline level of research quality when access to digital resources was held constant. The unstandardized coefficient for digital resources was 0.630, suggesting that an increase in access to digital academic resources led to a corresponding improvement in research quality by 0.630 units. The standardized beta coefficient of 0.716 further demonstrated a strong influence of digital resource access on research quality. In addition, the t-value of 19.931 with a significance level of 0.000 confirmed that the effect was statistically significant at the 5 percent level. This implied that access to digital academic resources was a major determinant of research quality among the respondents.

Test of Hypothesis Three

H_{03}: ICT skill level has no significant effect on research efficiency in Nigerian public universities.

Model 3

$RE = \beta_0 + \beta_1 IS + \varepsilon$

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669[a]	.447	.446	.37608

a. Predictors: (Constant), IS

Source: SPSS Output Version 27.0

The model summary results indicated that ICT skill level (IS) had a moderately strong relationship with research efficiency, as reflected by the correlation coefficient (R) of 0.669. The coefficient of determination (R^2) was 0.447, suggesting that approximately 44.7% of the variation in research efficiency was explained by ICT skill level. The adjusted R^2 value of

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0.446 further confirmed that the model retained a high explanatory power even after adjustment for potential bias. In addition, the standard error of the estimate was 0.37608, indicating a relatively low level of prediction error and suggesting that the model provided a good fit to the data. Overall, the findings implied that ICT skill level played a significant role in explaining differences in research efficiency among the respondents.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.214	1	43.214	305.543	.000[b]
	Residual	53.462	378	.141		
	Total	96.675	379			

a. Dependent Variable: RE
b. Predictors: (Constant), IS

Source: SPSS Output Version 27.0

The ANOVA results indicated that the regression model examining the effect of ICT skill level on research efficiency was statistically significant. The regression sum of squares was 43.214 with 1 degree of freedom, while the residual sum of squares was 53.462 with 378 degrees of freedom, representing the unexplained variation. The mean square for the regression was 43.214, compared to 0.141 for the residual. The computed F-value of 305.543 with a significance level of 0.000 was well below the 0.05 threshold, indicating that the model was a good fit for the data. This result suggested that ICT skill level had a significant effect on research efficiency, leading to the rejection of the null hypothesis.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.675	.136		12.316	.000
	IS	.586	.034	.669	17.480	.000

a. Dependent Variable: RE

Source: SPSS Output Version 27.0

The coefficient results revealed that ICT skill level had a positive and statistically significant effect on research efficiency. The constant value of 1.675 indicated the baseline level of research efficiency when ICT skill level was held constant. The unstandardized coefficient for ICT skill level was 0.586, suggesting that an increase in ICT skill level led to a corresponding increase of 0.586 in research efficiency. The standardized beta coefficient of 0.669 showed that ICT skill level exerted a strong influence on research efficiency. Furthermore, the t-value of 17.480 with a significance level of 0.000 indicated that the relationship was statistically significant at the 5 percent level. This implied that ICT skill level was a key determinant of research efficiency among the respondents.

DISCUSSION OF FINDINGS

The study revealed that internet accessibility had a significant effect on research productivity in Nigerian public universities. This implied that improved access to reliable and high-speed internet enhanced the ability of academic staff to search for relevant literature, collaborate with peers, and complete research tasks more efficiently, thereby increasing the volume of research output. This trajectory mirrors the empirical observations of Abbas and Song (2020), who established a strong positive correlation between digital accessibility and research utilization, while also reflecting Shomoye et al. (2023) finding that consistent connectivity sustains scholarly engagement; conversely, the infrastructural bottlenecks documented by

Idhalama et al. (2025) and Eze et al. (2018) confirm how network instability disrupts academic workflows.

The study also revealed that access to digital academic resources had a significant effect on research quality in Nigerian public universities. This implied that availability of up-to-date journals, databases, and electronic materials enabled researchers to produce more rigorous, credible, and impactful studies. This outcome substantiates Abubakar and Akor's (2017) report that electronic information substantially elevated publication caliber, aligns with Arumuru and David's (2024) demonstration of a positive relationship between resource availability and academic performance, and responds to Shonhe's (2020) caution regarding diminished citation impact in regions with constrained scholarly infrastructure. Within the TAM framework, the ready availability of high-quality academic materials directly amplifies Perceived Usefulness, as researchers immediately recognize how digital repositories can enrich methodological rigor and theoretical grounding; simultaneously, well-organized library platforms improve Perceived Ease of Use by simplifying retrieval processes, which fosters sustained engagement and translates into higher-quality scholarly contributions. The finding indicated that limited access to such resources could compromise the standard of research outputs, whereas improved access would enhance the depth, originality, and global relevance of academic work. This underscored the need for universities to prioritize subscriptions to reputable academic databases and strengthen digital library systems.

The study revealed that ICT skill level had a significant effect on research efficiency in Nigerian public universities. This implied that academic staff with higher levels of ICT competence were better able to utilize digital tools, manage research data, and complete research activities within shorter timeframes. This pattern corroborates Oyovwe-Tinuoye, Omeluzor, and Osaze Patrick's (2021) documentation of how digital proficiency directly enhances professional performance, reflects Odefunsho et al.'s (2022) identification of a critical gap between perceived readiness and actual technical competency, and reinforces Asaju and Ogar's (2022) emphasis on training deficits as a primary bottleneck to effective system integration.

Interpreted through TAM, ICT literacy operates as a foundational external variable that directly shapes Perceived Ease of Use; when scholars possess adequate digital competencies, they experience reduced cognitive load and troubleshooting friction, which cultivates a positive attitude toward technology integration and accelerates actual system use. The finding suggested that inadequate ICT skills could lead to delays and inefficiencies in research processes, while improved digital competencies would enhance productivity and reduce the time required to complete research tasks. This highlighted the importance of continuous training and capacity building in ICT skills for academic staff to improve research efficiency and overall performance.

CONCLUSIONS

The main aim of this study was to examine the influence of ICT access on academic research performance in Nigerian public universities, and based on the findings, it was concluded that ICT access plays a crucial role in enhancing research outcomes. The study established that access to digital technologies and resources is fundamental to improving research productivity, quality, and efficiency among academic staff. It was specifically found that internet accessibility significantly influenced research productivity, as reliable connectivity enabled academics to access relevant information, engage in collaboration, and increase their

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research output, while poor access could restrict active scholarly engagement. In addition, access to digital academic resources was found to have a significant impact on research quality, as the availability of online journals, databases, and electronic materials improved the credibility, depth, and relevance of research outputs, whereas limited access reduced the standard of academic work. Furthermore, ICT skill level was shown to significantly affect research efficiency, indicating that academics with stronger digital competencies were able to carry out research activities more effectively and within shorter timeframes, while inadequate skills hindered the optimal use of available technologies. The findings underscored the importance of strengthening ICT access in order to improve academic research performance in Nigerian public universities.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

i. Universities should invest in improving internet infrastructure by providing reliable, high-speed, and affordable internet access for academic staff. This would enhance research productivity by enabling easy access to information and facilitating collaboration.
ii. University management and relevant stakeholders should prioritize access to digital academic resources by subscribing to reputable databases and strengthening digital library systems. This would improve the quality of research outputs and ensure that academic staff have access to current and credible scholarly materials.
iii. Regular training programs and workshops should be organized to improve the ICT skills of academic staff. Enhancing digital competencies would enable researchers to effectively utilize ICT tools, thereby improving research efficiency.

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