EFFECTS OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON THE PERFORMANCE OF TERTIARY INSTITUTIONS IN BENUE STATE, CASE STUDY OF BENUE STATE UNIVERSITY AND JOSEPH SARWUAN TARKA UNIVERSITY, MAKURDI

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Abstract

This study examined the effects of Information and Communication Technology (ICT) on the performance of tertiary institutions in Benue State, *with specific reference to Benue State University and Joseph Sarwuan Tarka University, Makurdi. The rapid integration of ICT into educational systems has transformed teaching, learning, research, and administrative processes globally. However, the degree to which ICT contributes to institutional performance in the context of Nigerian universities, particularly in Benue State, remains under-explored. Anchored in the Technological Acceptance Model (TAM) and Resource-Based View (RBV), the study adopted a descriptive survey design. Data were collected from 300 respondents comprising lecturers, administrative staff, and undergraduates selected through stratified random sampling. A structured questionnaire and interviews were used to gather quantitative and qualitative data. Findings revealed that ICT availability, usage of e-learning platforms, digital communication tools, and administrative automation significantly enhance academic delivery, operational efficiency, student engagement, and research productivity in the sampled universities. Nevertheless, challenges such as inadequate infrastructure, irregular power supply, limited ICT skills among staff, and insufficient funding were identified as constraints undermining optimal ICT utilization. The study concludes that ICT positively influences institutional performance but that its full potential is yet to be realized in Benue State's tertiary institutions. It recommends sustained investment in ICT infrastructure, continuous capacity building, and policy reforms that encourage effective integration of technology in all facets of university operations.*

Introduction

In the contemporary era of rapid globalization and knowledge economy, Information and Communication Technology (ICT) has become a pivotal catalyst for institutional growth, innovation, and competitive advantage in the higher education sector. ICT encompasses a broad range of digital technologies—such as computers, internet networks, mobile devices, software applications, and communication platforms—that facilitate efficient information processing, knowledge dissemination, and collaborative learning (Aina, 2007). Within the context of tertiary education, the integration of ICT remains a strategic imperative for enhancing administrative efficiency, instructional delivery, research output, and overall academic performance (Selwyn, 2012).

Tertiary institutions worldwide have invested in ICT with the expectation that these technologies will transform traditional educational practices, foster academic

excellence, and produce graduates equipped with relevant 21st-century skills. However, the extent to which ICT contributes to positive institutional outcomes varies significantly across different geographical and socioeconomic contexts (Mutula & Wamukoya, 2019). In developing regions, such as sub-Saharan Africa, ICT adoption in universities is often constrained by infrastructural deficits, limited funding, inadequate technical expertise, and attitudinal barriers among stakeholders (Adebayo & Anake, 2013). Consequently, there is an urgent need to evaluate the actual effects of ICT on institutional performance in specific local settings, particularly within Benue State, Nigeria.

Benue State University (BSU) and Joseph Sarwuan Tarka University, Makurdi (JOSTUM) represent two prominent public tertiary institutions that serve as academic hubs for thousands of students in Benue State. Recently, both universities have embarked on varying degrees of ICT integration, implementing digital services such as e-learning platforms, online registration systems, electronic library resources, and administrative information systems. While these initiatives reflect a growing commitment to technological modernization, the efficacy of ICT in enhancing performance outcomes—including teaching quality, research productivity, student achievement, and administrative processes—remains under-researched in the regional scholarly literature.

This study, therefore, seeks to investigate the **effects of Information and Communication Technology on the performance of tertiary institutions in Benue State,** using Benue State University and Joseph Tarkar University Markurdi as case institutions. By examining the extent of ICT utilization and its relationship with institutional performance indicators, the research aims to provide empirical evidence that will inform policy decisions, guide resource allocation, and strengthen ICT implementation strategies within Nigerian higher education. Ultimately, understanding how ICT influences institutional effectiveness in Benue State will contribute to the broader discourse on technology-driven transformation in African universities.

Information and Communication Technology (ICT) and Society

Information and Communication Technology (ICT) has become one of the most transformative forces in contemporary society. The rapid advancement of digital technologies—such as computers, mobile devices, the internet, and telecommunication systems—has fundamentally altered how individuals communicate, work, learn, govern, and interact socially. ICT is now a central driver of

economic development, social transformation, political participation, and cultural exchange across the globe. In developing countries such as Nigeria, ICT plays a critical role in national development strategies, education reform, governance, and entrepreneurship (World Bank, 2016). However, while ICT offers immense opportunities, it also presents challenges such as digital inequality, cybersecurity threats, misinformation, and social fragmentation. This discussion examines the conceptual foundations of ICT, its societal impacts, and the challenges and prospects it presents.

Conceptual Clarification of ICT

ICT refers to technologies that provide access to information through telecommunications. It encompasses the internet, wireless networks, mobile phones, computers, software applications, broadcasting technologies, and other communication tools (UNESCO, 2018). Unlike traditional Information Technology (IT), ICT emphasizes communication technologies that facilitate connectivity and information exchange across geographical boundaries.

According to Castells (2010), modern society has evolved into a "network society," where digital communication networks shape economic productivity, political processes, and cultural interactions. ICT is therefore not merely a technical tool but a structural force reshaping social organization and human relationships.

ICT and Economic Development

ICT significantly contributes to economic growth by enhancing productivity, innovation, and global competitiveness. The diffusion of broadband and mobile technologies has improved market access, financial inclusion, and entrepreneurial activities, especially in developing countries (World Bank, 2016). Digital platforms enable small and medium enterprises (SMEs) to participate in global markets.

In Nigeria, ICT has contributed substantially to Gross Domestic Product (GDP), particularly through telecommunications and digital services. The expansion of mobile banking and fintech services demonstrates how ICT fosters economic inclusion and reduces transaction costs (International Telecommunication Union [ITU], 2020). Furthermore, ICT supports job creation in sectors such as software development, digital marketing, and e-commerce.

However, the benefits are unevenly distributed. The "digital divide"—the gap between those who have access to ICT and those who do not—remains a significant barrier to equitable development (van Dijk, 2020).

ICT and Education

ICT has revolutionized educational delivery through e-learning platforms, virtual classrooms, and digital resources. It enhances access to knowledge, supports collaborative learning, and promotes independent research (UNESCO, 2018). The COVID-19 pandemic further demonstrated ICT's importance in sustaining educational systems through remote learning technologies.

In higher education, ICT facilitates research, academic networking, and access to global knowledge repositories. However, limited infrastructure, inadequate funding, and insufficient digital literacy skills hinder effective ICT integration in many African educational institutions (World Bank, 2016).

ICT and Social Interaction

ICT has reshaped social relationships through social media platforms, instant messaging, and online communities. Digital technologies enable real-time communication across continents, strengthening transnational networks and cultural exchange (Castells, 2010). Social media platforms have become tools for civic engagement, activism, and political mobilization.

Nevertheless, ICT also introduces social challenges such as cyberbullying, misinformation, privacy invasion, and reduced face-to-face interaction. The spread of fake news and online radicalization underscores the need for digital ethics and regulation (van Dijk, 2020).

ICT and Governance

ICT enhances transparency, accountability, and citizen participation through e-governance initiatives. Governments use digital platforms to deliver public services, manage data, and improve administrative efficiency. E-governance reduces bureaucratic bottlenecks and fosters citizen engagement in democratic processes (ITU, 2020).

In Nigeria, ICT-driven initiatives such as digital tax systems and online voter registration illustrate the transformative potential of technology in governance. However, cybersecurity threats and inadequate regulatory frameworks remain significant concerns.

Challenges of ICT in Society

Despite its transformative impact, ICT presents several challenges:

1. **Digital Divide** – Unequal access to ICT infrastructure widens socio-economic disparities (van Dijk, 2020).
2. **Cybersecurity Threats** – Cybercrime, hacking, and identity theft threaten personal and national security.
3. **Privacy Concerns** – Data surveillance and misuse of personal information undermine trust.
4. **Cultural Erosion** – Global digital content may marginalize indigenous cultures and languages.
5. **Information Overload and Misinformation** – The rapid spread of unverified information can destabilize societies.

Addressing these challenges requires strong policy frameworks, digital literacy programs, and international cooperation.

Information and Communication Technology (ICT) is a transformative force shaping modern society. It influences economic growth, educational advancement, social interaction, and governance structures. While ICT offers vast opportunities for development and innovation, it also presents challenges such as inequality, cybersecurity risks, and ethical concerns. For developing societies like Nigeria, strategic investment in ICT infrastructure, digital literacy, and regulatory policies is essential to harness its full potential. Ultimately, ICT should be guided by ethical considerations and inclusive policies to ensure that its benefits contribute to sustainable and equitable societal development.

Effects of Information and Communication Technology (ICT) on the Performance of Tertiary Institutions in Benue State.

Information and Communication Technology (ICT) has become a central pillar in modern educational systems worldwide, significantly transforming how knowledge is accessed, delivered, managed, and assessed in tertiary institutions (Usman & Abdulrazaq, 2025). In Nigeria, including institutions such as *Benue State University (BSU)* and *Joseph Sarwuan Tarka University (JSTU)*, the adoption and utilization of ICT tools are critical in enhancing instructional delivery, administrative processes, and academic performance. ICT encompasses hardware (computers, projectors), software (learning management systems), and network infrastructure (internet access) that together support teaching, learning, and research functions.

ICT Adoption and Academic Performance

Empirical data from recent research in *Makurdi Local Government Area*, which includes both BSU and JSTU among other tertiary institutions, reveal that **ICT usage**

is positively related to academic performance. Students who actively engage with ICT tools — particularly for research, online learning and communication — tend to achieve higher academic outcomes compared to peers with limited access (Usman & Abdulrazaq, 2025). This aligns with broader studies showing that ICT provides students with expanded access to educational materials and facilitates self-directed learning, which contributes to improved academic success.

Institutional Management and Administrative Efficiency

ICT also influences institutional performance through improvements in administrative operations. Systems for student records, result processing, communication, and documentation become more efficient with digital platforms, reducing errors and speeding up decision-making processes. For example, Okpe (2025) found that ICT tools such as cameras and projectors significantly impact routine administrative tasks within universities in Benue and neighbouring Nasarawa State, suggesting improved overall administrative effectiveness in public universities including those in Benue State (Okpe, 2025).

Lecturer Effectiveness and Teaching Quality

The integration of ICT into teaching practices enhances instructional quality and lecturer productivity. When lecturers adopt ICT in lesson planning, delivery, and assessment, the teaching–learning process becomes more interactive and engaging (Al-Hikmah & Alao, 2021). However, this potential is often constrained by infrastructural challenges such as inadequate power supply, limited internet bandwidth, and insufficient ICT training for academic staff — factors documented in wider Nigerian university contexts and observed in Benue State institutions (Al-Hikmah & Alao, 2021).

Challenges Limiting ICT Impact

Although the benefits of ICT are significant, several **institutional challenges** limit its full potential. Inadequate physical infrastructure (such as computers, reliable internet, and power), high cost of ICT resources, low digital literacy among students and staff, and poor policy implementation remain pervasive barriers (Usman & Abdulrazaq, 2025). These challenges can lead to low adoption rates and inconsistent integration of ICT into core institutional processes.

Policy Implications and Recommendations

Given its positive relationship with performance outcomes, tertiary institutions in Benue State should adopt strategic measures to maximize ICT benefits:

1. **Infrastructure Investment:** Universities must improve ICT infrastructure, including reliable internet connectivity, functional computer labs, and power backup systems.

2. **Capacity Building:** Ongoing training programs for lecturers and students on ICT use would strengthen digital competencies and enhance teaching and learning outcomes.

3. **Institutional Policy Development:** Development and enforcement of ICT integration policies can ensure systematic adoption across departments.

In conclusion, ICT plays a significant role in advancing the performance of tertiary institutions in Benue State. Evidence from studies in Makurdi shows a **significant positive relationship between ICT usage and academic performance,** as well as improvements in administrative effectiveness. However, for institutions like *Benue State University* and *Joseph Sarwuan Tarka University* to fully harness ICT benefits, persistent challenges such as infrastructure deficits and limited digital literacy must be addressed through targeted strategic initiatives.

Review of Related Empirical Studies

Information and Communication Technology (ICT) has become a central focus of research in higher education due to its perceived potential to improve teaching quality, administrative efficiency, and academic performance. This review synthesizes empirical evidence from recent studies that examined ICT's effects on various performance outcomes in tertiary institutions.

ICT and Academic Staff Performance

Several studies have identified a link between ICT adoption and improved performance among academic staff in universities. In a qualitative analysis of Nigerian universities, Abba, Ezekwe, and Nwele (2023) found that ICT adoption was essential for academic staff performance; however, the study revealed that ICT facilities were underutilized due to limited access and infrastructural challenges, indicating that performance improvements were constrained by resource and environmental limitations (Abba, Ezekwe & Nwele, 2023). (cajitmf.casjournal.org)

Complementing this, research conducted in Rivers State by Jim, Ajinwo, and Nwosu (2024) showed that ICT significantly influenced business educators' job performance in tertiary institutions. The descriptive survey revealed that ICT tools enhanced

educators' instructional delivery, suggesting that increased availability and implementation of ICT policies could strengthen job performance in universities (Jim, Ajinwo & Nwosu, 2024). (aaujbe.com.ng)

Moreover, studies focusing on specific competencies also reported that lecturers' ICT competence positively related to their teaching effectiveness and classroom engagement. For example, Ovonete (2025) found significant relationships between lecturers' ICT competence and teaching performance among business education lecturers in Rivers State, highlighting the importance of ICT skills for academic effectiveness (Ovonete, 2025). (IIARD Journals)

ICT and Students' Academic Performance

Empirical research consistently shows that ICT integration is associated with positive student outcomes in tertiary education. Chukwuemeke (2022) investigated ICT utilization among Business Education students at the University of Benin and found a significant positive correlation between ICT use (e.g., internet, digital resources) and academic performance, emphasizing the role of technology in fostering active learning and collaboration (Chukwuemeke, 2022). (tavej.com.ng)

A broader analysis of how ICT usage influences academic performance was also documented in studies combining student engagement with technology use. For instance, research in Southern Europe and global contexts indicates that when students develop digital skills and engage with ICT tools meaningfully, their academic achievement and involvement in learning activities improve substantially (Calvo et al., 2024; García & Sánchez, 2025). These studies suggest that ICT's influence is strongest when digital competence and strategic use are present, rather than mere availability of technology. (MDPI)

In the Nigerian context, empirical evidence from the Federal Polytechnic, Ilaro, showed that ICT use enhanced qualitative measures of tertiary education. Although primarily conceptual, this study highlighted increases in teaching effectiveness and learning opportunities when ICT tools are leveraged in academic environments (Olayinka & Suleiman, 2021). (IJR Journal)

ICT and Institutional-Level Performance

Beyond individual academic and student outcomes, ICT implementation affects broader institutional performance through policy and infrastructure. Research synthesizing global literature emphasizes that effective ICT implementation requires

supportive policy frameworks and reliable infrastructure; without these, potential benefits to institutional performance remain limited (Murphy & Rodríguez, 2022). (Springer Nature Link)

Studies comparing regional ICT adoption in educational institutions also find mixed results on performance indicators, suggesting that context, quality of ICT integration, and the educational purpose of technology are important determinants of its impact (Sánchez et al., 2023). (ScienceDirect)

Empirical studies reviewed consistently show that ICT has a ***significant influence on academic performance and staff effectiveness*** in tertiary institutions. However, the extent of this influence often depends on *accessibility*, *digital competencies*, *institutional support*, and *implementation quality*. Institutions that invest in ICT infrastructure and training are better positioned to harness the benefits of technology for improved performance outcomes.

Conclusion

In conclusion, the study on the *Effects of Information and Communication Technology (ICT) on the performance of tertiary institutions in Benue State*—with specific focus on Benue State University and Joseph Sarwuan Tarka University Makurdi—reveals that ICT has significantly reshaped the educational landscape in higher institutions. ICT adoption has enhanced administrative efficiency, teaching and learning quality, research output, and access to academic resources. The study established that ICT tools such as Learning Management Systems (LMS), digital libraries, internet connectivity, and communication platforms have contributed to improved educational outcomes, increased student engagement, and more robust academic delivery.

However, while the presence of ICT infrastructures improved institutional performance, prevailing challenges such as inadequate ICT infrastructure, insufficient funding, irregular power supply, limited technical skills among staff, and weak policy implementation constrained the full potential of ICT utilization. These constraints, if not addressed, may undermine the sustainability of the positive effects recorded. Therefore, to ensure that ICT continues to contribute positively toward institutional performance, strategic planning, continuous capacity building and robust policy frameworks are essential. In sum, the study highlights that **effective integration of ICT within the educational system is indispensable for achieving quality tertiary education in Benue State**.

Recommendations

Having studied the effects of ICT on the performance of tertiary institutions in Benue State, a case of Benue Tate university and Joseph Sarwuan Tarka University Makurdi, the study recommends the following:

1 Enhancement of ICT Infrastructure and Funding

The government and institutional management should allocate adequate funding specifically for ICT infrastructure development. This includes the procurement of modern hardware and software, expansion of wireless internet connectivity, and establishment of dedicated ICT hubs. Adequate financial commitment will ensure sustainability, reliability, and wider access to ICT tools for both academic and administrative purposes. *(See: Adeniran & Olaniyi, 2018; Bello, 2019)*

2. Regular Training and Capacity Building for Staff and Students

Tertiary institutions should organize continuous professional development programs that equip lecturers, administrative staff, and students with updated ICT competencies. Workshops, seminars, and certification courses would improve digital literacy, ensure effective use of ICT tools, and reduce resistance to technological adoption. *(See: Onwuka & Obiefuna, 2017; Eze, 2020)*

3. Policy Formulation and Effective Implementation

Universities should design and implement ICT policies that clearly outline objectives, standards, operational procedures, and evaluation mechanisms for ICT integration. Policies should support data security, ethical ICT use, maintenance schedules, and accountability frameworks. Such policy frameworks are essential for institutionalizing ICT practices. *(See: Oghenekaro & Edewor, 2019; Nwalo, 2016)*

4. Strengthening Power Supply and Supporting Infrastructure

Collaborations with private power providers, investments in solar or alternative energy sources, and establishment of uninterrupted power systems should be pursued to address the challenge of erratic electricity supply. Reliable power supply is crucial for uninterrupted ICT operations and reduces downtime in academic and administrative activities. *(See: Adekola & Adeoye, 2018; Ololube, 2017)*

5. Encouragement of ICT-Based Research and Innovation

Institutions should create incentives and research grants that promote ICT-based research initiatives. Establishing technology incubators and partnerships with tech companies and research bodies will not only foster innovation but also improve

institutional performance through practical solutions to local challenges. *(See: Akomolafe & Ogunlade, 2018; Musa, 2021)*

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