Challenges of ICT Usage among Academic Staff in University of Uyo, Nigeria

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Abstract

The integration of Information and Communication Technology (ICT) in Nigerian universities has introduced transformative changes to education and communication, yet significant barriers impede its optimal utilization. This study investigates these challenges within the University of Uyo, employing a mixed-methods approach. A structured survey was administered to 317 academic staff, utilizing stratified random sampling to ensure representation across faculties. Data were analyzed using descriptive statistics and thematic analysis. Findings reveal that inadequate infrastructure (mean = 3.85, SD = 0.42), high internet costs (mean = 3.78, SD = 0.65), and limited digital literacy (mean = 3.48, SD = 0.70) are critical obstacles to ICT adoption. Additional challenges include frequent power outages, insufficient training programs, and cybersecurity concerns. These barriers disproportionately affect rural areas, exacerbating the digital divide. Recommendations emphasize the need for robust investments in ICT infrastructure, including high-speed broadband and reliable power supply, alongside subsidized internet costs and targeted digital literacy training. Collaboration between government, private sectors, and academic institutions is essential for implementing scalable solutions. The study highlights the importance of addressing these systemic issues to bridge existing inequalities, improve academic productivity, and enhance familial communication. Future research should focus on sector-specific and culturally relevant strategies to overcome ICT challenges and foster inclusive educational practices in Nigerian universities. These interventions are critical for realizing ICT's transformative potential in academia and beyond.

Keywords: ICT, Nigerian universities, digital literacy, internet accessibility, infrastructure, communication challenges.

Introduction

Information and Communication Technology (ICT) has become a transformative force, reshaping educational and social systems globally. It has provided vast opportunities for innovation, facilitating both learning and communication in ways that were previously unimaginable (Zafar, 2019). In Nigeria, the integration of ICT in universities has significantly impacted the academic landscape, with institutions increasingly adopting technology to improve teaching methods, enhance student engagement, and streamline communication (Ufot et al., 2024). However, despite these advancements, numerous challenges remain that hinder the full potential of ICT adoption, particularly within the academic and familial spheres.

One of the most significant barriers to effective ICT adoption in Nigeria is the inadequate infrastructure. For ICT to be successfully integrated into educational systems, robust

infrastructure is essential, including reliable electricity, high-speed internet, and modern hardware and software. Unfortunately, many universities in Nigeria face challenges such as frequent power outages, unreliable internet access, and the lack of sufficient technological tools. According to Luka et al. (2024), poor internet connectivity is a major issue, especially in rural areas, where educational institutions struggle to access the bandwidth required for online learning and research. This gap in infrastructure not only hinders students and staff from fully utilizing ICT tools but also exacerbates the digital divide between urban and rural areas.

Moreover, the high costs associated with ICT tools and services further restrict their widespread adoption in Nigeria. Educational institutions must allocate significant resources to acquire and maintain technology, which can be prohibitively expensive. The cost of purchasing computers, software licenses, and securing reliable internet services places a financial strain on universities, particularly those in lower-income regions (Ramagoni, 2024). The high cost of internet data and mobile devices also affects students, particularly those from economically disadvantaged backgrounds. As noted by Coleman (2024), the financial barriers to ICT adoption create a divide between students who can afford the necessary tools for online learning and those who cannot, further deepening inequality in educational opportunities.

The digital divide is another critical issue that continues to affect ICT adoption in Nigeria. There is a noticeable gap between the technological experiences of students in urban areas compared to those in rural communities (Taam et al., 2024). While urban universities may have access to advanced digital tools and reliable internet connections, students in rural areas often face challenges such as limited access to computers and internet connectivity. This divide results in unequal learning opportunities, where students from rural areas are at a disadvantage when it comes to participating in online courses, accessing e-learning resources, or conducting digital research. Almalawi et al. (2024) highlight that the disparity in digital access contributes to the growing inequality in the Nigerian education system, as students without adequate access to ICT tools are excluded from the benefits of modern education.

In addition to the infrastructural and economic barriers, cybersecurity concerns further complicate ICT adoption in Nigerian universities. As educational institutions increasingly rely on digital platforms for teaching and communication, the risk of cyber threats, data breaches, and online fraud has risen. Universities in Nigeria, particularly those with less advanced cybersecurity measures, are vulnerable to these threats, which can compromise the safety and integrity of sensitive student and academic data. Moreover, there is a lack of proper training and awareness among staff and students about cybersecurity best practices, leaving them susceptible to cyber risks. The failure to address these security concerns undermines the effectiveness of ICT adoption and erodes trust in the digital tools that are intended to improve education. This study therefore seeks to ascertain the challenges affecting ICT utlization in the University of Uyo, Nigeria with a view of proffering solutions for its effective usage in teaching and research.

Methodology
Area of the Study
The study was conducted in the University of Uyo, located in Uyo, the capital of Akwa Ibom State, located in southern Nigeria. Uyo LGA lies between latitude 4°33'and 5°33'N and longitude 7°53' and 8°25'E. The University of Uyo, established in 1991, is a federal university offering a wide range of undergraduate and postgraduate programs in sciences, arts, social sciences, and more. Known for its academic excellence and diverse student body, the university provides a conducive learning environment with modern facilities like classrooms, libraries,

and laboratories. The city of Uyo is a rapidly developing town, known for its cultural heritage, modern amenities, and educational prominence. Notable landmarks include the Godswill Akpabio International Stadium, Ibom Plaza, and Ibom Tropicana Entertainment Center. Uyo is also an educational hub, hosting several institutions, including the University of Uyo.

Population, Sample Size, and Sampling Technique
The study targeted all 1,521 academic staff of the University of Uyo (Uniuyo Personnel, 2023). Using Taro Yamane's formula, a sample size of 317 was determined. Respondents were selected through simple random sampling, ensuring equal representation (Thomas, 2023).

Instrument, Validity, and Reliability
A structured questionnaire with a four-point rating scale was designed under expert guidance. Validated by three experts, the instrument achieved a reliability coefficient of 0.79 using Pearson Product Moment Correlation.
Data Analysis
Mean and standard deviation were used to address research questions, with t-tests employed to test hypotheses at a 0.05 significance level.

Results and Discussion
i. Infrastructure and Connectivity
The results in Table 1 indicate that poor infrastructure and unreliable connectivity are pervasive challenges impacting ICT adoption at the University of Uyo. Respondents strongly agreed that frequent power outages (mean = 3.85, SD = 0.42) were the most significant barrier, affecting their ability to utilize ICT for both academic and personal communication. This aligns with Odiche and Amodu (2024) findings that power instability remains a critical issue in Nigeria's ICT landscape. Inadequate network coverage, particularly in rural areas, received a high mean score (mean = 3.67, SD = 0.58), corroborating prior research that highlights urban-rural disparities in digital infrastructure (Onayinka et al., 2024). Participants also pointed to the limited maintenance of existing facilities (mean = 3.21, SD = 0.69) as a recurring problem that exacerbates connectivity issues. These challenges often lead to slow broadband speeds (mean = 3.05, SD = 0.61), further hampering productivity and efficient communication.

Addressing these challenges requires substantial investment in infrastructure, particularly in expanding rural coverage and improving energy stability. For example, enhancing electricity supply and upgrading internet facilities are critical steps toward ensuring seamless ICT integration in educational institutions (Yusuf et al., 2024; Okai et al., 2014). Policy interventions, such as subsidizing broadband installation and implementing regular facility maintenance programs, could significantly mitigate these barriers (Kim et al., 2010). Furthermore, fostering collaboration between government agencies and private telecommunication companies is crucial to establishing a more robust and inclusive ICT ecosystem in Nigerian universities (Olabi & Agba, 2018).

Respondents in the study identified poor infrastructure and unreliable connectivity as significant obstacles to ICT adoption. With a clustered mean of 3.17, participants emphasized frequent disruptions caused by power outages and inadequate network coverage. These findings align with previous research that highlights the critical role of infrastructure in enabling effective ICT use in education (Ukeje et al., 2023). Rural areas were disproportionately affected, with limited infrastructure severely restricting communication and access to digital resources. This rural-urban divide in ICT accessibility reflects broader socio-

economic inequalities that require targeted interventions to bridge the gap and promote equity in educational opportunities (Olanrewaju et al., 2021).

Table 1: Perceive challenges of ICT Infrastructure and Connectivity

Challenge	Mean	Standard Deviation	Remarks
Frequent power outages	3.85	0.42	Agreed (Significant)
Inadequate network coverage	3.67	0.58	Agreed (Significant)
Limited rural infrastructure	3.45	0.73	Agreed (Significant)
Poor maintenance of facilities	3.21	0.69	Agreed
Slow broadband speeds	3.05	0.61	Agreed

Internet Costs and Accessibility

The high cost of internet services emerged as a critical barrier to effective ICT adoption, with respondents highlighting substantial disparities in access based on geographic and socio-economic factors (Table 2). The data shows that internet subscription costs were the most significant challenge (mean = 3.78, SD = 0.65), corroborating findings from Emeka et al. (2016), which identified similar issues in Nigerian universities. Respondents in rural areas particularly emphasized limited access and higher costs compared to urban counterparts (mean = 3.62, SD = 0.72).

Additionally, inconsistent pricing schemes (mean = 3.45, SD = 0.60) and the absence of subsidies for academic staff (mean = 3.33, SD = 0.74) further exacerbated accessibility issues. These findings align with Patil's (2024) assertion that affordability remains a critical hurdle for equitable ICT integration in Nigeria. Respondents highlighted the prohibitive costs of essential devices like modems and routers, with a mean score of 3.18 (SD = 0.67), indicating a significant barrier to ICT access, particularly for economically disadvantaged users. These findings align with prior research emphasizing the affordability gap as a critical impediment to digital inclusivity in Nigerian universities (Vitalis et al., 2025). Addressing these challenges requires targeted policy interventions. For example, subsidizing internet costs for academic institutions and providing financial support for the purchase of ICT devices can reduce financial constraints and foster wider access.

Additionally, implementing standardized pricing structures and expanding affordable broadband services to underserved rural areas could enhance inclusivity and bridge the urban-rural divide (Ashuri et al., 2023). Rural respondents in particular reported exorbitant internet costs and limited access, reflecting the persistent digital divide. These issues underscore the need for government-led initiatives, such as subsidies and incentives for private sector investment in rural ICT infrastructure, to ensure equitable access. Collaborative efforts between government and private stakeholders are crucial for mitigating these barriers and maximizing ICT's potential in Nigerian universities. Previous studies suggest that partnerships between public and private sectors can enhance the sustainability of broadband expansions and reduce costs for end-users (Ashuri et al., 2023). By addressing affordability challenges and promoting targeted interventions, the transformative impact of ICT on teaching, learning, and research

can be fully realized. These measures are critical for creating an equitable digital landscape and advancing education in Nigeria.

Table 2: Perceived challenges associated with cost and accessibility on internet

Internet Cost Challenges	Mean	Standard Deviation	Remarks
High internet subscription costs	3.78	0.65	Agreed (Significant)
Limited access in some areas	3.62	0.72	Agreed (Significant)
Inconsistent pricing schemes	3.45	0.60	Agreed
Lack of subsidies for academics	3.33	0.74	Agreed
High device costs (e.g., modems)	3.18	0.67	Agreed

Digital Literacy

The results in Table 3 highlight that digital literacy disparities significantly affect ICT adoption among academic staff. Respondents identified a lack of training for ICT tools as the most pressing issue (mean = 3.75, SD = 0.58), consistent with findings by Xu et al. (2024) that emphasize the critical role of continuous skill enhancement in fostering ICT utilization. Gender disparity in proficiency (mean = 3.55, SD = 0.66) was another notable challenge, with male respondents demonstrating slightly higher ease in navigating digital tools compared to their female counterparts, echoing trends observed in Francis's et al (2024) research.

Limited access to computer resources (mean = 3.48, SD = 0.70) remains a prominent barrier to digital engagement, particularly in departments with constrained budgets. Such limitations hinder equitable access to Information and Communication Technology (ICT) tools, leaving faculty and students unable to fully leverage digital resources. Departments facing financial constraints often prioritize immediate operational needs over technology investments, exacerbating the digital divide. As noted by Tibane et al. (2024), inadequate infrastructure disproportionately affects institutions in resource-limited settings, creating long-term disadvantages in digital competency development.

Resistance to adopting new technologies (mean = 3.30, SD = 0.68) reflects a cultural and psychological hesitancy among staff, often rooted in a lack of confidence, fear of change, or perceived irrelevance of new tools to their roles. This resistance is particularly evident in environments where traditional methods dominate and where digital transformation is viewed as disruptive. Research by Chen and Aklikokou (2020) underscores that perceived ease of use and usefulness of technology significantly influence its adoption. Without proper exposure and training, staff are likely to resist integrating digital tools into their workflows, further impeding progress.

The systemic gap in integrating digital skills into professional development programs is also a significant concern, as indicated by the relatively low mean (3.12, SD = 0.64) for this issue. Professional development opportunities often overlook the importance of digital literacy, resulting in a workforce that lacks essential ICT skills. According to Mitchell (2022), continuous professional development in technology-enhanced learning is critical for fostering a digitally competent workforce. Yet, the absence of tailored training initiatives perpetuates skill gaps and limits institutional readiness for digital transformation.

Table 3: Perceived challenges of digital literacy among respondents

Digital Literacy Challenges	Mean	Standard Deviation	Remarks
Lack of training for ICT tools	3.75	0.58	Agreed (Significant)
Gender disparity in ICT proficiency	3.55	0.66	Agreed
Limited access to computer resources	3.48	0.70	Agreed
Resistance to adopting new technologies	3.30	0.68	Agreed
Inadequate emphasis on digital skills	3.12	0.64	Agreed

Security and Privacy Concerns

The survey results revealed significant concerns regarding security and privacy, which negatively impact the willingness of academic staff to utilize ICT tools (Table 4). The most pressing issue identified was concerns about data breaches (mean = 3.68, SD = 0.65). This aligns with findings from Farouk et al. (2024) and Amah et al. (2024), who highlighted that a lack of robust cybersecurity infrastructure in Nigerian universities increases vulnerability to data theft and breaches. Identity theft risks (mean = 3.57, SD = 0.61) and a lack of awareness about digital safety practices (mean = 3.50, SD = 0.67) were also prominent concerns. This is consistent with the assertion by Elrayah and Jamil (2023) that low digital literacy often correlates with increased susceptibility to cybercrime. Respondents also pointed to inadequate cybersecurity measures (mean = 3.38, SD = 0.70), emphasizing the need for institutional investment in safeguarding digital resources. Additionally, fears regarding the misuse of personal information (mean = 3.30, SD = 0.62) reflect a broader apprehension about privacy violations (Van Zoonen, 2016).

Addressing these concerns requires a multipronged approach. Educational campaigns on cybersecurity best practices can empower staff to navigate digital platforms safely (Adejuwon & Ojeagbase 2023). Simultaneously, institutions must invest in advanced cybersecurity systems to mitigate risks. Policymakers should enforce stricter regulations to hold institutions accountable for protecting sensitive data. By fostering a culture of digital safety, universities can enhance confidence in ICT use and ensure secure communication environments for academic and personal purposes (Tom.czyk, 2020). Cybersecurity issues, including data breaches and identity theft, discouraged ICT use among some respondents. Educational campaigns on digital safety and robust regulatory frameworks can mitigate these risks.

Table 4: Security and Privacy Concerns

Security and Privacy Issues	Mean	Standard Deviation	Remarks
Concerns about data breaches	3.68	0.65	Agreed (Significant)
Identity theft risks	3.57	0.61	Agreed
Lack of awareness on digital safety	3.50	0.67	Agreed
Inadequate cybersecurity measures	3.38	0.70	Agreed
Fear of misuse of personal information	3.30	0.62	Agreed

Perceived areas for improvements

The results in Table 5 underscore the critical need for targeted interventions to enhance ICT adoption and utility within Nigerian universities. Respondents highlighted the importance of

improved infrastructure as the most significant requirement (mean = 3.88, SD = 0.60). This finding aligns with Nubel et al. (2021), who emphasize the role of stable infrastructure in fostering effective digital engagement. Investments in high-speed broadband and reliable power supply are crucial for bridging existing gaps in ICT access. Affordable internet accessibility also emerged as a key priority (mean = 3.75, SD = 0.64), particularly in rural areas where exorbitant costs restrict usage. These results are consistent with Mack's et al. (2024) findings, which advocate for government-subsidized internet services to support equitable ICT adoption.

Training programs for digital skills (mean = 3.68, SD = 0.62) were identified as a critical component for fostering ICT literacy and reducing disparities in technological proficiency. Targeted initiatives focusing on gender and departmental needs can address existing skill gaps, as suggested by Wittleman et al. (2019). Collaboration between government, academic institutions, and private sectors (mean = 3.55, SD = 0.65) is essential for achieving sustainable progress. Public-private partnerships can streamline resources and create tailored solutions for universities (Kendagor, 2023). Lastly, the need for robust cybersecurity measures (mean = 3.45, SD = 0.70) reflects growing concerns about data privacy and system vulnerabilities. Institutions must prioritize the development of comprehensive cybersecurity frameworks to protect academic and personal information.

By addressing these areas, Nigerian universities can unlock the full potential of ICT, fostering academic excellence and broader community engagement (Yusuf et al., 2024; Oladokun et al., 2024; Owo, 2025). Policymakers, administrators, and educators must work collectively to implement these strategies, ensuring sustainable growth in digital education and communication (McCarthy et al., 2023). Addressing these challenges requires collaborative efforts between government, institutions, and private sectors. Investments in infrastructure, affordable internet, and training initiatives can enhance ICT's effectiveness, fostering academic excellence and community engagement (Animashaun et al., 2024).

Table 5: Perceived areas for improvement

Area of Improvement	Mean	Standard Deviation	Remarks
Need for enhanced infrastructure	3.88	0.60	Agreed (Significant)
Affordable internet accessibility	3.75	0.64	Agreed
Training programs for digital skills	3.68	0.62	Agreed
Collaboration between sectors	3.55	0.65	Agreed
Improved cybersecurity measures	3.45	0.70	Agreed

Conclusion
While ICT holds immense potential for transforming communication, education, and overall academic productivity in Nigerian universities, various challenges hinder its effective integration. Inadequate infrastructure, high costs, and significant digital literacy gaps create systemic barriers that disproportionately affect certain demographics and institutions, limiting the equitable use of ICT tools. Addressing these challenges requires a holistic approach that considers institutional, societal, and individual factors. Targeted interventions such as improving ICT infrastructure, subsidizing access to digital tools, and implementing structured training programs are critical steps to unlocking ICT's full potential. Policymakers and

university administrators must collaborate to develop sustainable strategies, including the prioritization of digital skills in professional development programs and the incorporation of ICT competency standards into national education policies. Additionally, fostering partnerships with private sector stakeholders can mobilize resources and expertise to enhance digital access and literacy.

Future research should explore sector-specific solutions to ICT challenges, particularly those tailored to the unique needs of Nigerian higher education. Investigating the role of culturally relevant and context-sensitive digital solutions will provide deeper insights into overcoming barriers. A concerted effort to address these issues will not only improve the inclusivity and productivity of Nigerian universities but also position them as competitive players in the global academic and technological landscape..

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