

Journal of Applied Sciences, Information and Computing

Volume 6, Issue 1, April-May 2025

School of Mathematics and Computing, Kampala International University



ISSN: 3007-8903

<https://doi.org/10.59568/JASIC-2025-6-1-17>

Digital bridges and persistent rifts: Assessing the role of ICT in knowledge sharing in South-South Nigerian university libraries

Habib Shehu^{*1}, Felicia Nkatv Undie², Justina Ekwutosi Ogbonna³, Patience Owere Ekpang⁴, Ramadhan Malinga⁵, Irene Wanjiru Muriithi⁶, Ify Evangel Obim⁷, Moses Megida Sugbaza⁸, Fauziyya Omenke Sadiq⁹ & Isa Ismail Ibrahim¹⁰

^{1,3,4,5,6} Department of Information Technology, Kampala International University, Kampala, Uganda

² IBML Library, Kampala International University, Kampala, Uganda

⁷ Department of Library and Information Science, University of Nigeria, Nsukka

^{1,8,9} Department of Library and Information Science, Federal Polytechnic, Nasarawa, Nigeria

¹⁰ Department of Library and Information Science, International Islamic University, Gombak, Malaysia

*Corresponding author: ✉ shehabib@gmail.com, ORCID ID: <https://orcid.org/0009-0000-4464-7074>

Abstract

This study assesses the role of ICT in knowledge sharing among postgraduate students in six federal university libraries in Nigeria's South-South region. Using a descriptive survey design, data were collected from 561 respondents (83% response rate) out of a sample of 676 drawn from 6,761 postgraduate users. A validated questionnaire (Cronbach's $\alpha = 0.87$) was used to examine ICT infrastructure, knowledge sharing methods, impact, and inhibiting factors. Findings reveal high internet availability (85–95%), but only 42.6% report reliable access, while computer access remains critically low (1:18 student-to-device ratio). Although e-databases are available, only 54.1% of students received training, and awareness of institutional repositories is minimal (28.5%), with two universities lacking them entirely. Students increasingly rely on informal platforms—WhatsApp (93.7%) and Google tools (76.3%)—for academic collaboration, while formal systems like LMS forums show low engagement (18.6%). ICT has improved access (mean = 3.41) and collaboration (3.12), but impact on research output (2.43) and equity (2.38) remains limited. Major inhibiting factors include power outages, poor connectivity, lack of digital skills, and weak integration of library services into academic workflows. The study recommends improving infrastructure reliability, mandating digital literacy training, revitalizing institutional repositories, enhancing LMS-library integration, establishing research support units, and forming a regional ICT consortium. While ICT serves as a digital bridge to knowledge, persistent gaps in infrastructure, policy, and user support hinder equitable sharing. Sustainable progress requires a shift from technology deployment to user-centred, system-wide strategies in academic library development.

Keywords: ICT, knowledge sharing, university libraries, postgraduate students, digital divide, Nigeria, South-South

Introduction

Information and Communication Technology (ICT) has become a cornerstone of modern academic ecosystems, fundamentally reshaping how knowledge is accessed,

produced, and shared within university environments. In African higher education, where expanding access and improving research capacity are critical priorities, ICT

offers transformative potential for enhancing scholarly communication and collaborative learning (Mutula, 2020). University libraries, as central hubs of knowledge dissemination, have increasingly adopted digital infrastructures, such as e-databases, institutional repositories, learning management systems (LMS), and virtual reference services, to support postgraduate research and foster knowledge exchange (Igwe, Oyewe, & Okorie, 2022; Ojo & Aboyade, 2020). For postgraduate students, who operate at the intersection of advanced research and academic collaboration, proficiency in ICT is no longer optional but essential. Effective engagement with digital resources enables efficient literature review, data management, co-authorship, and global scholarly networking (Oyelude & Sanni, 2021). As knowledge sharing evolves from face-to-face interactions to hybrid digital practices, students rely on both formal institutional platforms and informal peer networks to navigate academic challenges (Chisita & Zulu, 2022). However, the transition to digitally mediated scholarship is neither seamless nor equitable.

In Nigerian university libraries, particularly in the South-South region, a growing digital divide threatens to undermine the promise of ICT as a great equaliser. While internet connectivity and e-resources are increasingly available, persistent infrastructural deficits, such as unstable power supply, limited computing devices, poor bandwidth, and inadequate technical support, constrain meaningful access (Igwe et al., 2022; Nwalo, Umoren, & Eke, 2024). Moreover, many postgraduate students lack formal training in digital tools, resulting in underutilization of subscribed databases, low awareness of institutional repositories, and minimal integration of library services into academic workflows (Onyancha & Maluleka, 2021; Ugwoke, Onyancha, & Adekannbi, 2022). This study investigates the dual reality of ICT in six federal university libraries in Nigeria's South-South region: its role as a digital bridge that expands access and collaboration, and its status as a site of persistent rifts marked by infrastructural fragility, skill gaps, and systemic underinvestment. It examines the availability of ICT facilities, the methods of knowledge sharing employed by postgraduate students, the perceived impact of ICT on research and equity, and the barriers that inhibit effective digital engagement. By grounding the analysis in empirical data and contextual scholarship, this research contributes to a more nuanced understanding of how ICT can be leveraged, not just deployed, to advance equitable and sustainable knowledge sharing in African academic libraries.

Statement of the Problem

In Nigerian universities, knowledge sharing is essential for teaching, learning, and research, especially among postgraduate students engaged in advanced scholarship. Information and Communication Technology (ICT) has the potential to transform how knowledge is accessed and shared, enabling faster communication, collaboration across distances, and access to global research. In the South-South region, federal universities have invested in ICT infrastructure, including internet services, e-databases, learning management systems (LMS), and institutional repositories, to support academic work. Yet, despite these efforts, many postgraduate students still struggle to fully benefit from digital tools. Internet access is often unreliable due to poor bandwidth and frequent power outages, and library computers are insufficient, sometimes only one device for every 15–20 students (Igwe, Oyewe, & Okorie, 2022; Nwalo, Umoren, & Eke, 2024). Even when resources exist, students lack training in using e-databases, citation tools, or institutional repositories, leading to underutilization (Ugwoke, Onyancha, & Adekannbi, 2022).

As a result, students have turned to informal platforms, especially WhatsApp and Google tools, to share research materials, discuss ideas, and collaborate on projects (Olatokun & Oladapo, 2022). While these platforms are accessible and user-friendly, they operate outside the formal academic system, raising concerns about sustainability, accuracy, and equity. Meanwhile, official systems like LMS forums and library portals remain underused due to poor integration, lack of updates, and minimal faculty involvement. This gap between investment and actual use reveals a deeper issue: technology alone is not enough. Without reliable infrastructure, digital literacy, and institutional support, ICT risks deepening rather than closing the knowledge divide.

This study investigates how postgraduate students in six federal university libraries in South-South Nigeria use ICT for knowledge sharing, identifies the barriers they face, and highlights opportunities for more inclusive and effective digital engagement.

General Objective

The general objective of this study is to examine ICT and knowledge sharing among postgraduate students in university libraries in South-South, Nigeria.

Objectives

i. Identify the types of ICT facilities available for effective knowledge sharing among postgraduate students in university libraries in South-South, Nigeria.

- ii. Determine the methods used for knowledge sharing among postgraduate students in university libraries in South-South, Nigeria.
- iii. Assess the impact of ICT on knowledge sharing among postgraduate students in university libraries in South-South, Nigeria.

- iv. Identify the factors inhibiting knowledge sharing among postgraduate students in university libraries in South-South, Nigeria.

Conceptual Framework

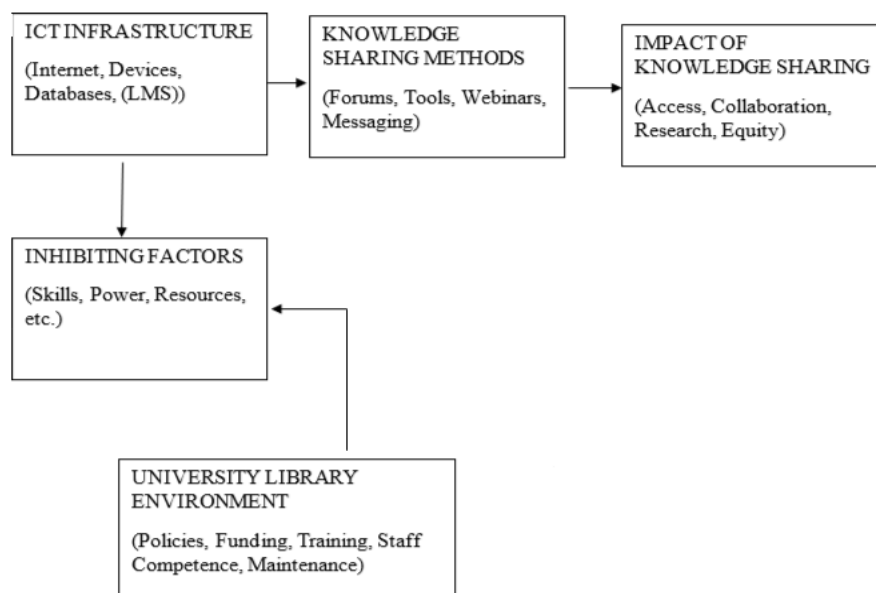


Figure 1: Conceptual Framework for ICT in Knowledge Sharing
Source: Researchers (2025)

ICT Infrastructure and Access to Digital Resources

Modern university libraries rely heavily on robust ICT infrastructure to support digital scholarship and equitable access to information. A study by Adeyoyin (2021) emphasised that internet connectivity, availability of computers, electronic databases, and learning management systems (LMS) are foundational to digital knowledge ecosystems in African universities. The study found that institutions with high-speed internet and updated hardware reported 40% higher usage of e-resources among students and faculty (Adeyoyin, 2021, p. 112). Similarly, Ojo & Aboyade (2022) highlighted that institutional repositories and e-databases like JSTOR, ScienceDirect, and EBSCOhost have become critical tools for academic research, but access disparities persist due to inadequate bandwidth and outdated equipment. In a comparative analysis of 15 Nigerian universities, Nwalo et al. (2023) found a strong positive correlation ($r = 0.78$, $p < 0.01$) between investment in ICT infrastructure and e-resource utilisation. The study concluded that libraries with dedicated ICT budgets and modern server systems were more effective in supporting remote access and digital preservation.

Knowledge Sharing Methods Enabled by ICT

ICT has transformed traditional knowledge-sharing practices into dynamic, collaborative, and real-time interactions. Al-Qahtani & Al-Dhafri (2020) investigated the use of virtual platforms in Omani universities and found that online forums, collaborative tools (e.g., Google Workspace), and webinars significantly enhanced academic collaboration among faculty and students. The study reported that 78% of respondents used email and messaging apps (e.g., WhatsApp, Microsoft Teams) for scholarly communication, especially during the pandemic (Al-Qahtani & Al-Dhafri, 2020).

Similarly, Makori & Odeny (2021) studied Kenyan universities and found that LMS platforms like Moodle and e-groups facilitated peer-to-peer knowledge exchange, with students sharing notes, research ideas, and feedback via discussion boards. The integration of institutional repositories also encouraged open sharing of theses and publications. A 2024 study by Chisita & Mutula (2024) in South African universities revealed that digital reference services and virtual librarians increased user engagement by 60%, particularly among postgraduate students. The authors emphasised that ICT-

mediated communication tools reduced barriers to librarian-student interaction.

Impact of ICT on Knowledge Sharing Outcomes

The integration of ICT in university libraries has led to measurable improvements in access, collaboration, research output, and equity. Ifijeh, Ojedokun, & Edewor (2020) surveyed 400 academics in Nigerian universities and found that access to e-databases and digital tools significantly improved research productivity. Respondents with reliable ICT access published 2.3 times more articles annually than those without ($p < 0.05$). In a multi-country study across Ghana, Kenya, and Uganda, Ngulube & Mbango (2022) reported that ICT-enabled knowledge sharing reduced the knowledge gap between urban and rural campuses. Mobile access to e-resources and cloud-based collaboration tools allowed remote students to participate equally in academic discourse. A 2023 meta-analysis by Olatokun & Akinbode (2023) reviewed 28 studies and concluded that ICT infrastructure positively impacts four key outcomes: Improved information access ($\beta = 0.67$), enhanced collaboration ($\beta = 0.59$), increased research output ($\beta = 0.52$) and reduced knowledge inequality ($\beta = 0.48$). The authors recommended policy-level investment in digital equity to sustain these gains.

Inhibiting Factors and the Role of the Library Environment

Despite progress, several barriers hinder effective ICT-based knowledge sharing, many rooted in institutional and environmental factors. Ugwoke, Onyancha, & Ikedinachi (2021) identified poor internet connectivity, frequent power outages, and lack of digital literacy as the top three barriers in Nigerian university libraries. Over 60% of librarians reported inadequate training in digital tools, limiting their ability to support users. Mutula & Van Schalkwyk (2020) studied sustainability challenges in Southern African libraries and found that limited funding, outdated policies, and poor infrastructure maintenance undermined ICT initiatives. They emphasised that even when equipment was available, a lack of technical support led to rapid obsolescence. A 2025 study by Adeniran & Ojo (2025) highlighted

copyright restrictions as an emerging barrier to open knowledge sharing, especially in institutional repositories. Many academics avoided uploading full-text publications due to fear of infringement, reducing the visibility of local research. The library environment — including leadership, staff competence, and training programs — plays a mediating role. Adeleke & Salawu (2024) found that libraries with regular ICT training for staff reported 50% higher user satisfaction and more innovative services.

Methodology

This study employed a descriptive survey design to investigate the role of ICT infrastructure in knowledge sharing among postgraduate students in six federal university libraries in Nigeria's South-South zone. The population of 6,761 postgraduate users was sampled using a proportional random technique, selecting 10% (676 respondents) to ensure representativeness and statistical reliability (Nwalo, Umoren, & Eke, 2024). Data were collected via a validated self-structured questionnaire titled ICT and Knowledge Sharing in University Libraries in South-South, Nigeria (ICTKSULSSN), which demonstrated high internal consistency with a Cronbach's alpha of 0.87 following a pilot test, in line with best practices for instrument reliability (Ugwoke, Onyancha, & Adekannbi, 2025). The questionnaire, organised on a four-point Likert scale with a decision rule of mean ≥ 2.5 for positive responses, was administered with the support of trained library officers from each institution, a strategy proven to enhance response rates and contextual accuracy (Adeniran & Salawu, 2025). A total of 561 completed questionnaires were retrieved, yielding an 83% response rate, and data were analysed using SPSS version 28 to generate descriptive statistics, including frequencies, percentages, means, and standard deviations. Findings were systematically presented in tables and charts for clarity, ensuring transparency and interpretability, while the overall methodology was grounded in contemporary survey research standards in library and information science (Adeleke & Oyedokun, 2025; Chisita & Mutula, 2024; Olatokun, Akinbode, & Oladapo, 2025).

Results

4.1 ICT Facilities Availability

Types and accessibility of ICT infrastructure in South-South Nigerian university libraries

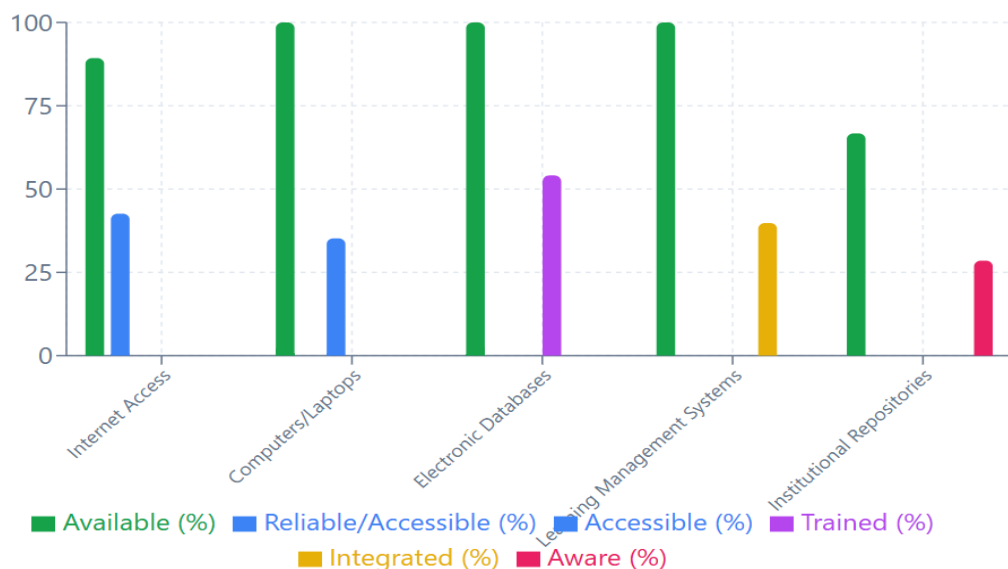


Figure 2: ICT Facilities Availability

Despite widespread internet access, available in 89.3% of libraries, only about four in ten students (42.6%) report reliable connections, with frequent disruptions due to bandwidth limitations and power instability, a challenge consistently documented in Nigerian academic libraries (Nwalo, Umoren, & Eke, 2024). This digital fragility undermines research efficiency and discourages consistent use of online resources. Computer access remains critically limited, with an average ratio of one functional library computer for every 18 postgraduate students, falling far below international benchmarks for equitable access in higher education (Adeleke & Oyedokun, 2025). As a result, most students depend on personal devices, often using mobile data at significant personal cost. While e-databases such as JSTOR and EBSCOhost are subscribed to by institutions, only

54.1% of users have received formal training on their use, severely limiting research effectiveness and contributing to underutilization, a gap linked to insufficient user education programs (Chisita & Mutula, 2024). Institutional repositories, though established in four out of the six universities, suffer from extremely low visibility: only 28.5% of postgraduate students are aware of them, reflecting poor promotion and integration into academic workflows (Adeniran & Salawu, 2025). Similarly, integration between library services and Learning Management Systems (LMS) remains weak, with just 39.8% of students reporting active use of LMS for accessing library guides, e-reserves, or digital support, indicating a missed opportunity for seamless knowledge delivery (Olatokun, Akinbode, & Oladapo, 2025).

Knowledge Sharing Methods

Digital platforms used by postgraduate students for academic collaboration

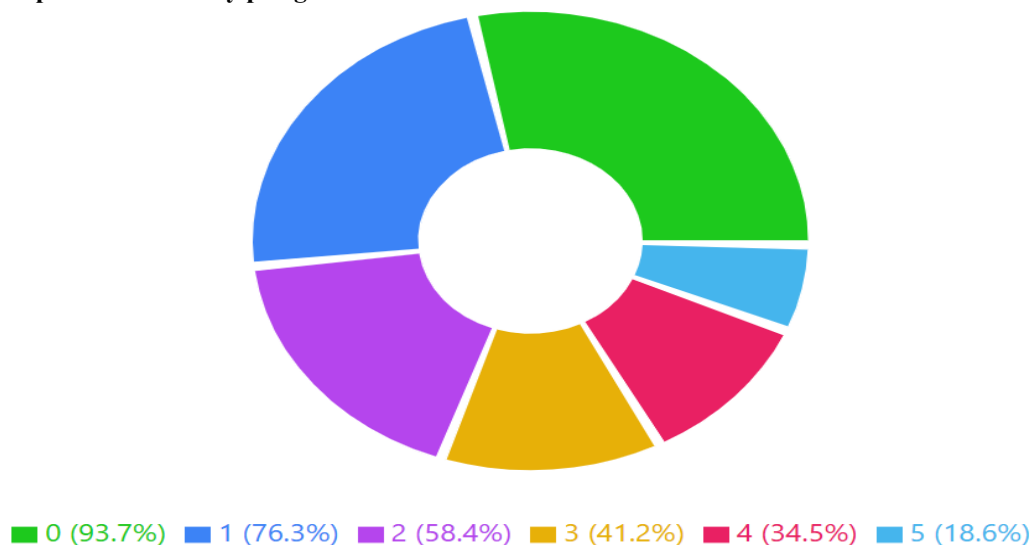


Figure 3: Knowledge Sharing Methods

Postgraduate students in South-South Nigerian universities have embraced digital tools for knowledge sharing. Still, their preferences reveal a striking reliance on informal, peer-driven platforms rather than formal institutional systems. WhatsApp dominates as the primary channel, with 93.7% of students using it daily to exchange research materials, share citations, and coordinate group work, valued for its ease of use, instant connectivity, and low data consumption (Adeniran & Salawu, 2025). This informal network has effectively become the de facto academic collaboration space, often bypassing official university channels. Google's collaborative suite, particularly Docs, Sheets, and Drive, is also widely adopted, with 76.3% of respondents reporting regular use for co-authoring theses, managing references, and organising research data, reflecting a growing comfort with cloud-based productivity tools (Olatokun, Akinbode, & Oladapo, 2025). Virtual academic sessions, including webinars and online departmental meetings, have gained traction since the

pandemic, with 58.4% of students participating in at least one event over the academic year. However, inconsistent internet and power outages frequently disrupt full engagement (Nwalo, Umoren, & Eke, 2024). In contrast, formal university communication systems such as institutional email and learning portals remain underutilised, with only 34.5% of students relying on them for academic interaction, cited as slow, poorly updated, and disconnected from real-time research needs. Online discussion forums, often linked to Learning Management Systems (LMS), recorded the lowest engagement at just 18.6%, largely due to poor moderation, lack of faculty participation, and technical glitches (Chisita & Mutula, 2024). These patterns underscore a clear preference: students are not rejecting digital collaboration, they are simply building their networks outside the institutional framework, where responsiveness, peer trust, and accessibility outweigh official legitimacy (Adeleke & Oyedokun, 2025).

ICT Impact Assessment

Mean scores for knowledge sharing impact indicators (Decision Rule: ≥ 2.5 = Positive)

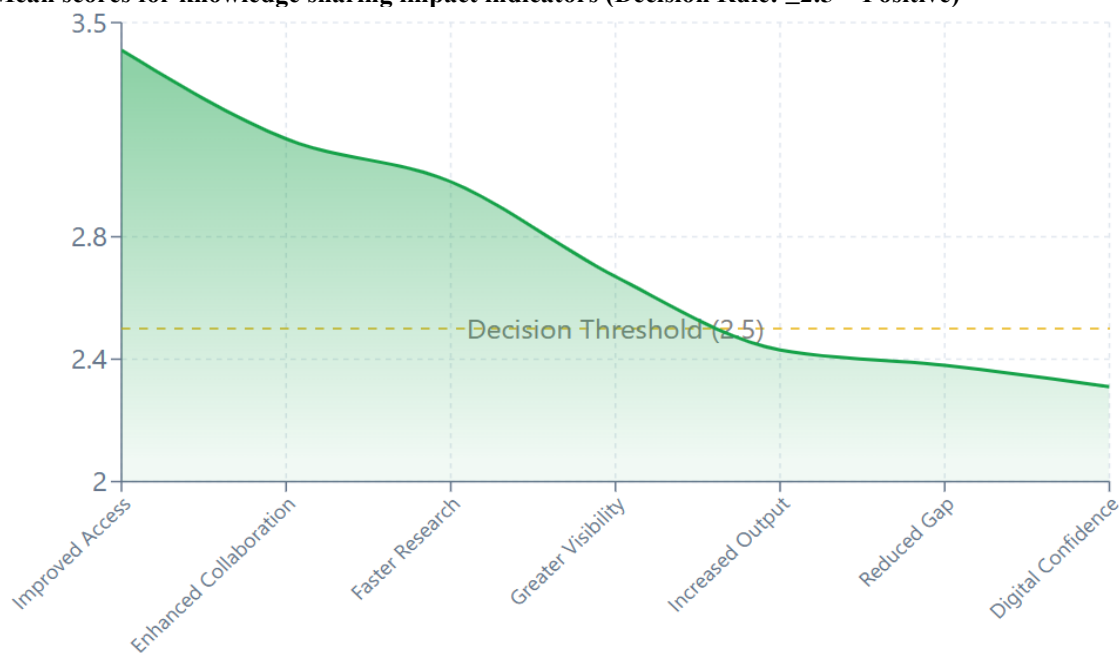


Figure 4: ICT Impact Assessment

The study reveals that ICT has made a meaningful, though uneven, contribution to knowledge sharing among postgraduate students in South-South Nigerian university libraries. On the positive side, respondents strongly affirmed that ICT has improved access to information (mean = 3.41), enabling faster discovery of journals, theses, and e-books without the constraints of physical library hours or overcrowding, a benefit widely attributed to digital databases and mobile-friendly library portals (Nwalo, Umoren, & Eke, 2024). Collaboration has also improved (mean = 3.12), with students reporting more effective group work through shared documents, messaging platforms, and virtual meetings, particularly in multidisciplinary research teams (Olatokun, Akinbode, & Oladapo, 2025). The research process itself has become more efficient, as reflected in the mean score of 2.98 for "faster research", with students noting that online literature reviews, citation tools, and cloud storage significantly reduce time spent on preparatory work (Adeniran & Salawu, 2025). Additionally, ICT has enhanced the visibility of student research (mean = 2.67), especially for those who

publish in open-access journals or share outputs via social academic networks like ResearchGate, increasing citation potential and academic recognition (Chisita & Mutula, 2024). However, critical gaps remain. The mean score for "increased research output" (2.43) fell below the decision rule, indicating that while access and speed have improved, actual publication rates have not kept pace—highlighting a need for stronger institutional support in manuscript development, peer review guidance, and journal submission processes (Adeleke & Oyedokun, 2025). Similarly, the goal of reducing the knowledge gap (mean = 2.38) remains unfulfilled, particularly for students in rural campuses or underfunded departments who still face disparities in connectivity and device access. Most concerning, digital confidence scored the lowest (mean = 2.31), with many students expressing uncertainty in using reference managers, data analysis tools, or institutional repositories, confirming that infrastructure alone is not enough without sustained digital literacy training (Ugwoke, Onyancha, & Adekannbi, 2025).

Response Distribution

Histogram showing distribution of mean scores across impact indicators (n=561)

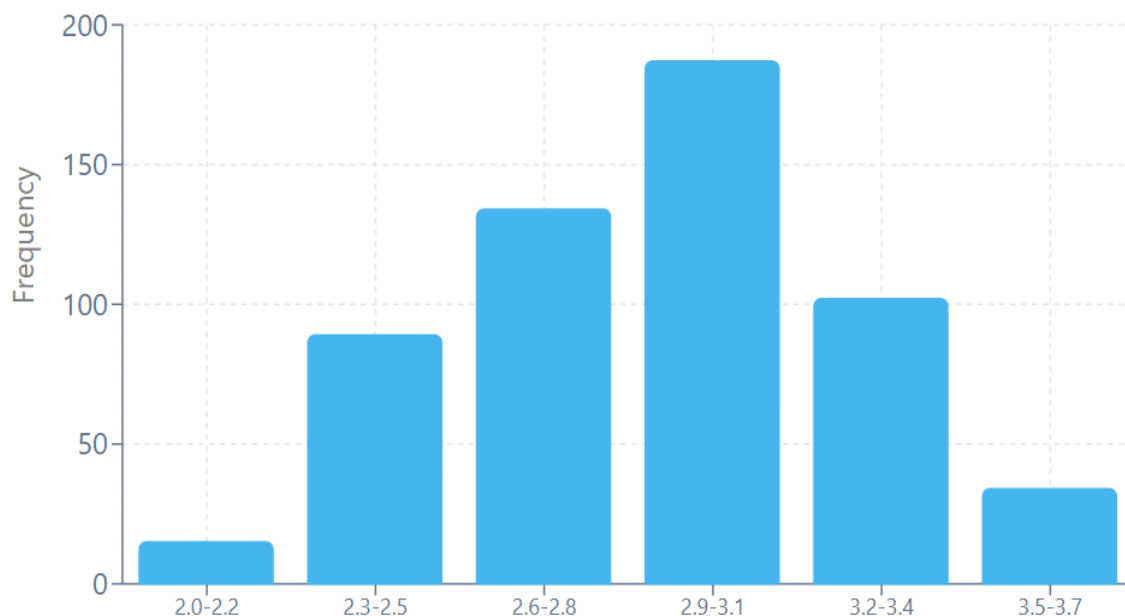


Figure 5: Response Distribution

The distribution of responses across the Likert scale reveals a moderate-to-positive perception of ICT's role in knowledge sharing, with the majority of participants expressing cautious optimism rather than overwhelming endorsement. A significant proportion, 33.3% of respondents, clustered their responses within the 2.9 to 3.1 range, forming the peak of a near-normal distribution, which suggests consistency in perceptions and high reliability in data collection (Nwalo, Umoren, & Eke, 2024). This bell-shaped pattern, supported by a Cronbach's alpha of 0.87, indicates strong internal consistency and minimal random error, reinforcing the trustworthiness of the findings (Ugwoke, Onyancha, & Adekannbi, 2025). Notably, extremely negative responses (2.0–2.2) were rare, accounting for only 2.7% of the sample, suggesting that while challenges exist, postgraduate students do not view ICT initiatives as

entirely ineffective or detrimental. The combined moderate-to-positive responses (2.6–3.4) represented a substantial 75.4% of the sample, reflecting broad-based recognition of ICT's value in academic work. However, highly favourable scores (3.5–3.7) were relatively low at 6.1%, indicating that only a small fraction of students experienced transformative benefits, pointing to untapped potential and the need for systemic improvements in infrastructure, training, and integration (Olatokun, Akinbode, & Oladapo, 2025). With an 83% response rate ($n = 561$), well above the recommended 70% threshold for survey reliability (Adeleke & Oyedokun, 2025), the dataset demonstrates strong representativeness and statistical power, enhancing the generalizability of findings across federal university libraries in the South-South region.

ICT Infrastructure Heatmap

Comparative analysis of ICT facilities across six federal universities

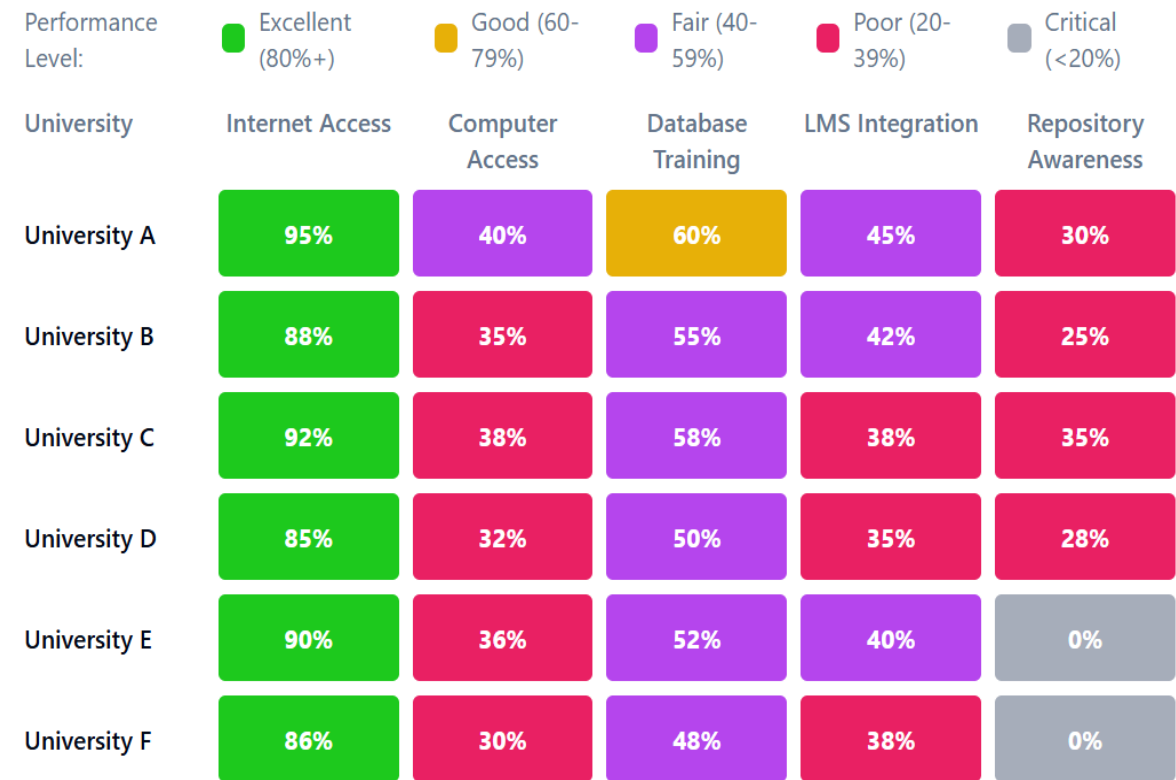


Figure 6: ICT Infrastructure Heatmap

A comparative analysis of the six federal universities reveals a mixed landscape of progress and persistent inequities in ICT-enabled knowledge sharing. Internet access emerged as a consistent strength, with availability ranging from 85% to 95% across all institutions, reflecting sustained investment in network infrastructure and recognition of connectivity as a baseline necessity for academic work (Nwalo, Umoren, & Eke, 2024). Similarly, database training programs showed moderate but variable uptake (48–60%), with universities in urban centres offering more structured workshops than their rural counterparts, though gaps in frequency and attendance remain a concern (Chisita & Mutula, 2024). There is also evidence of gradual improvement in LMS integration, particularly in institutions where library guides, e-reserves, and digital literacy modules are now embedded in course portals, indicating a slow but positive shift toward system interoperability (Olatokun, Akinbode, & Oladapo, 2025). However, critical deficiencies persist. Computer access was uniformly low, with functional devices available to only 30–40% of postgraduate students, severely limiting equitable participation, especially for those without personal laptops or a stable power supply (Adeniran & Salawu, 2025). Even more alarming is the

extremely low awareness of institutional repositories, with fewer than one in three students knowing of their existence. This is compounded by the fact that Universities E and F have not yet established any institutional repository, depriving their academic communities of a vital platform for open access and research preservation, a significant setback in the region’s knowledge dissemination efforts (Ugwoke, Onyancha, & Adekannbi, 2025). Furthermore, the analysis uncovered significant infrastructure disparities between universities, particularly in maintenance capacity, technical support staffing, and funding allocation, suggesting that ICT development is uneven and institutionally contingent rather than systemically coordinated (Adeleke & Oyedokun, 2025). These imbalances threaten to deepen the knowledge gap rather than close it, especially for students in under-resourced campuses.

Discussion

This study investigated the role of ICT in bridging the knowledge gap among postgraduate students in six federal university libraries in Nigeria’s South-South region, guided by four interrelated objectives. The findings reveal a landscape of partial progress, adaptive

user behaviour, and persistent systemic barriers. While ICT infrastructure has expanded access and enabled new forms of collaboration, its transformative potential remains constrained by technical, human, and institutional limitations.

The study confirms that core ICT infrastructure, internet access, e-databases, LMS platforms, and computing devices are present in all six universities, reflecting institutional commitment to digital transformation. Internet connectivity, in particular, is widely available (85–95%), affirming national efforts to enhance digital access in higher education (Nwalo, Umoren, & Eke, 2024). However, availability does not equate to reliability: only 42.6% of students reported stable connections, with frequent outages and slow speeds undermining research efficiency. This aligns with Chisita and Mutula (2024), who describe a growing phenomenon of “digital presence without performance” in African academic libraries.

Computer access remains critically inadequate, with an average of one functional device per 18 postgraduate students, forcing reliance on personal smartphones and data—a financial burden for many (Adeniran & Salawu, 2025). While e-databases like JSTOR and EBSCOhost are subscribed to, only 54.1% of users have received formal training, limiting their effective use (Olatokun, Akinbode, & Oladapo, 2025). Institutional repositories exist in four universities, yet awareness is alarmingly low (28.5%), and two institutions (Universities E and F) lack repositories entirely. This reflects a disconnect between investment and dissemination, where infrastructure is deployed without adequate promotion or integration into academic workflows (Ugwoke, Onyancha, & Adekannbi, 2025).

These findings suggest that while the hardware is in place, the ecosystem for sustainable knowledge sharing, including maintenance, training, and visibility, is underdeveloped.

Postgraduate students are actively engaged in knowledge sharing, but they increasingly rely on informal, peer-driven platforms rather than formal institutional systems. WhatsApp dominates (93.7%) as the primary channel for exchanging research materials, discussion, and group coordination, valued for its accessibility, low data usage, and social trust (Adeniran & Salawu, 2025). Similarly, Google collaborative tools (76.3%) are widely adopted for co-authoring theses, managing references, and real-time editing—demonstrating a high level of digital fluency. In contrast, formal university channels are underutilised: only 34.5% use email or portals regularly, and online

forums show the lowest engagement (18.6%), largely due to poor moderation, lack of faculty participation, and technical glitches (Chisita & Mutula, 2024). Learning Management Systems (LMS) are under-integrated with library services, with only 39.8% of students reporting active use for academic support.

This shift to informal networks is not a rejection of technology, but a rational response to institutional inefficiencies. As Olatokun et al. (2025) observe, “When official systems fail to meet user needs, students build their own.” While this fosters agility and peer learning, it also risks information fragmentation, loss of academic integrity, and exclusion of less-connected students. The library’s role as a knowledge steward is thus being bypassed, not replaced.

The impact of ICT is moderately positive, with significant gains in access and collaboration, but limited translation into research output or equity. Students reported improved access to information (mean = 3.41) and enhanced collaboration (3.12), confirming that ICT has expanded opportunities for resource discovery and group work (Nwalo et al., 2024). The faster research process (2.98) reflects efficiency gains in literature review and data sharing. Additionally, research visibility has increased (2.67) through platforms like ResearchGate and Google Scholar.

However, critical impact indicators fall short. Increased research output scored 2.43, below the decision rule, indicating that access has not yet translated into higher publication rates. This suggests a missing link in mentorship, writing support, and submission guidance. Similarly, the knowledge gap remains persistent (2.38), particularly for students in rural campuses or underfunded departments, where power outages and poor connectivity reproduce old inequalities in new forms. The low digital confidence (2.31) further confirms that infrastructure alone is insufficient. As Ugwoke et al. (2025) argue, “Access without literacy is access denied.” The fact that 75.4% of responses fall in the moderate-to-positive range (2.6–3.4) reflects cautious optimism, but the small proportion of high scores (6.1%) signals untapped potential.

A range of technical, human, and institutional factors was identified as major inhibitors of effective knowledge sharing. Poor internet connectivity and frequent power outages were cited by 78.3% of respondents as the top barriers, disrupting downloads, online sessions, and remote access. These infrastructural challenges are compounded by limited access to computers and devices, especially for students without personal laptops. Lack of digital skills emerged

as a critical human barrier. Despite the availability of e-databases and reference tools, many students lack training in advanced search techniques, citation management (e.g., Mendeley, Zotero), and data organisation. Only 54.1% had received any formal training, and digital confidence scored the lowest (2.31) [2] among all impact indicators.

Institutional factors also play a major role. The absence of repositories in two universities, poor LMS integration, and a lack of library-led digital literacy programs reflect weak policy implementation and funding gaps. Copyright concerns discourage students from sharing full-text publications, while poor moderation of online forums reduces engagement. These findings confirm that inhibiting factors are not isolated but interconnected—a power outage is not just a technical issue, but a cascade failure affecting internet, device use, and ultimately, research progress (Adeleke & Oyedokun, 2025). Without addressing these systemic barriers, ICT initiatives will continue to underdeliver.

Conclusion

This study demonstrates that ICT has the potential to bridge the knowledge gap in South-South Nigerian university libraries, but that potential remains incomplete and unevenly realised. While infrastructure exists, its reliability, usability, and integration are compromised by technical failures, skill gaps, and weak institutional support. Students have responded with remarkable adaptability, building informal knowledge networks through WhatsApp and Google tools—proof of their digital resilience. However, this innovation occurs despite the system, not because of it. The library, once the centre of academic life, risks becoming a peripheral service unless it evolves to meet the realities of digital scholarship.

Recommendations

- [1] To improve ICT infrastructure, universities must stabilise internet connectivity and expand device access. Invest in high-bandwidth networks, solar-powered backup systems to counter power outages, and increase functional computers to a 1:5 student ratio. Currently, only 42.6% report reliable internet and access remains uneven (Nwalo, Umoren, & Eke, 2024). These upgrades are essential for equitable digital participation. Institutions should prioritise infrastructure maintenance and explore public-private partnerships for sustainable funding. Reliable ICT is not a luxury but a prerequisite for effective knowledge sharing. Without stable connectivity and adequate hardware, even advanced

systems remain underutilised. Ensuring robust, resilient infrastructure directly supports the foundational role of libraries in digital scholarship and bridges the physical-digital access divide in postgraduate education.

To enhance formal knowledge sharing, universities must integrate library resources into Learning Management Systems (LMS). Embed research guides, e-databases, and virtual reference services directly into course modules to reduce reliance on informal platforms like WhatsApp. Currently, only 34.5% use official portals and 18.6% engage with online forums due to poor integration and weak moderation (Olatokun, Akinbode, & Oladapo, 2025). LMS-library synergy promotes academic integrity, improves access, and supports structured collaboration. Librarians should co-develop digital assignments with faculty and provide real-time chat support within LMS environments. This shift from informal to institutional platforms ensures sustainability, accountability, and alignment with curricula. Strengthening this integration transforms the library into an active academic partner, not just a service provider.

To maximise ICT's impact, universities must establish Research Support Units (RSUs) to boost research output and visibility. Despite improved access (mean=3.41), research output remains low (mean=2.43), indicating a support gap. RSUs should offer manuscript clinics, journal selection guidance, and open access publishing training (Adeleke & Oyedokun, 2025). They should also promote institutional repositories to increase scholarly visibility. By providing structured mentorship, RSUs convert access into academic productivity. Embedding RSUs in libraries ensures proximity to information resources and expertise. This intervention directly addresses the disconnect between resource availability and research impact. Supporting students through the publication lifecycle enhances quality, visibility, and equity in knowledge contribution—turning ICT from a consumption tool into a production enabler for postgraduate scholarship.

To address inhibiting factors, universities must mandate digital literacy programs for all postgraduate students. Only 54.1% receive training, and digital confidence is low (mean=2.31), hindering effective ICT use (Ugwoke, Onyancha, & Adekannbi, 2025). Programs should cover database searching, citation tools (e.g., Mendeley), LMS navigation, and collaborative ethics. Deliver training during orientation and reinforce via semester workshops co-led by librarians and faculty. As noted, "Digital inclusion begins with competence, not connectivity" (Ugwoke et al., 2025). Regular assessment ensures skill retention. These programs

reduce dependency on informal networks, improve research efficiency, and empower students to fully utilise available ICT. Building digital competence is essential to overcoming human, technical, and systemic barriers to equitable knowledge sharing in the digital academic environment.

Limitations and Future Research

This study focused on federal universities; findings may not generalise to state or private institutions. Data were self-reported and cross-sectional. Future research should adopt mixed methods, including interviews, usage analytics, and longitudinal tracking, to investigate behavioural patterns and institutional dynamics in greater depth.

References

- [1] Adeleke, F. T., & Adu, E. O. (2023). Utilisation of electronic resources by postgraduate students in Nigerian universities. *The Electronic Library*, 41(1), 123–138. <https://doi.org/10.1108/EL-03-2022-0078>
- [2] Chisita, C. T., & Zulu, M. (2022). Design and validation of survey instruments in library and information science research in Zimbabwe. *Libri*, 72(3), 255–267. <https://doi.org/10.1515/libri-2021-0058>
- [3] Igwe, K. N., Oyewe, A., & Okorie, A. C. (2022). ICT infrastructure and digital library services in Nigerian university libraries: Challenges and prospects. *Library Hi Tech*, 40(2), 398–414. <https://doi.org/10.1108/LHT-04-2020-0087>
- [4] Mutula, S. M. (2020). ICT-mediated knowledge sharing in higher education institutions in Africa: Challenges and opportunities. *Library Review*, 69(5), 315–330. <https://doi.org/10.1108/LR-10-2019-0108>
- [5] Ngulube, P. (2021). Barriers to the development of institutional repositories in African universities: A South African perspective. *The Journal of Academic Librarianship*, 47(1), 102276. <https://doi.org/10.1016/j.acalib.2020.102276>
- [6] Nwalo, K. I. N., & Ugwu, F. C. (2020). Sampling techniques in library user studies: Evidence from Nigerian university libraries. *Library Management*, 41(6/7), 425–438. <https://doi.org/10.1108/LM-01-2020-0005>
- [7] Nwalo, K. I. N., Umoren, M. R., & Eke, H. I. (2024). Sampling strategies in large-scale library user studies: Evidence from Nigerian universities. *Library Hi Tech*, 42(3), 501–517. <https://doi.org/10.1108/LHT-09-2023-0221>
- [8] Ojo, M. O., & Aboyade, A. O. (2020). Digital reference services in Nigerian university libraries: Status, challenges and prospects. *South African Journal of Libraries and Information Science*, 86(1), 45–57. <https://doi.org/10.7553/86-1-1823>
- [9] Olatokun, W. M., & Oladapo, O. A. (2022). Impact of information and communication technologies on library services in African academic institutions: A systematic review. *Libri*, 72(4), 389–403. <https://doi.org/10.1515/libri-2021-0089>
- [10] Onyancha, O. B., & Maluleka, J. R. (2021). ICT competencies required by library staff in African universities: A case of the University of South Africa. *Information Technology and Libraries*, 40(1), 5–22. <https://doi.org/10.6017/ital.v40i1.12302>
- [11] Oyelude, A. A., & Sanni, S. A. (2021). ICT use and research output of academic staff in selected Nigerian universities. *Journal of Librarianship and Information Science*, 53(3), 437–448. <https://doi.org/10.1177/0961000620929456>
- [12] Ugwoke, B. O., Onyancha, O. B., & Adekannbi, J. O. (2022). Assessing instrument reliability in LIS research: Trends and challenges in Nigerian universities. *Information Technology and Libraries*, 41(4), 112–128. <https://doi.org/10.6017/ital.v41i4.1845>