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# AVAILABILITY OF INFORMATION AND COMMUNICATION TECHNOLOGY FACILITIES AND HINDRANCES TO ELECTRONIC RESOURCE SHARING IN FEDERAL UNIVERSITY LIBRARIES IN NORTH-EAST NIGERIA

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**Abstract**
*Information and Communication Technology (ICT) facilities play a crucial role in enabling electronic resource sharing and supporting digital scholarly communication in university libraries. However, Federal University Libraries in North-East Nigeria continue to face infrastructural and operational challenges that limit the effective use of ICT for resource exchange. The objective of this study was to assess the availability of ICT facilities and to identify the hindrances affecting electronic resource sharing in Federal University Libraries within the region. A descriptive survey research design was adopted, and data were collected from library staff in three Federal Universities using a validated questionnaire. The population comprised 344 library staff across the Federal University Kashere Library, ATBU Library, and the Ramat Library of the University of Maiduguri, and a census sampling technique was used since the population was accessible and manageable. The findings indicated that basic ICT facilities such as computers, internet connectivity, online public access catalogues, library management software, and access to electronic resources are generally available in the libraries. In contrast, advanced ICT facilities required for effective and sustainable electronic resource sharing, including institutional repositories, specialised databases, digital scanning equipment, and audio-visual technologies, were found to be inadequate. The study also revealed several hindrances to electronic resource sharing, notably limited funding, inadequate ICT infrastructure, poor communication and coordination among libraries, insufficient staff training, weak institutional policies, low awareness of the benefits of collaboration, security concerns, and geographical constraints. The study concludes that while Federal University Libraries in North-East Nigeria possess foundational ICT infrastructure, significant gaps remain in advanced technologies and institutional support systems necessary for effective electronic resource sharing. The study therefore recommends increased investment in ICT infrastructure, improved internet bandwidth, continuous staff capacity development, strengthened policy frameworks, and the*

*adoption of sustainable digital platforms to enhance electronic resource sharing among Federal University Libraries in the region.*

**Keywords:** ICT Availability, Electronic Resource Sharing, ICT Challenges, Academic Libraries

**Introduction**

Information and Communication Technology (ICT) facilities are central to the transformation of academic library operations globally. Modern university libraries rely heavily on ICT to support the creation, management, dissemination, preservation, and sharing of digital resources (IFLA, 2021; Yaacob, Singh, & Aziz, 2020). ICT has enabled academic libraries to transition from traditional print-based systems to hybrid and fully digital environments, providing platforms for remote access to information, enhancing information retrieval, facilitating electronic resource sharing, and supporting teaching, learning, and research (Adeleke & Olorunsogo, 2020; Fatoki, 2022). The availability and adequacy of ICT facilities ranging from computers, servers, networks, database systems, and institutional repositories to cloud-based services therefore serve as critical indicators of a library's readiness to participate in digital scholarly communication (Dadzie, 2009; Ochai & Lawal, 2020).

In the context of academic libraries, electronic resource sharing has become an essential mechanism for widening access to scholarly materials, reducing duplication of subscriptions, and ensuring cost-effective collection development (Corrall & Pinfield, 2014; Shibanda & Wema, 2022). Through ICT-driven platforms, libraries can exchange e-books, e-journals, digital archives, and research outputs, and collaborate through consortia agreements, union catalogues, shared databases, and interoperable library management systems (Alemna & Adjei, 2021). However, the effectiveness of such initiatives is largely dependent on the robustness of a library's ICT infrastructure. Libraries with adequate ICT equipment, reliable internet connectivity, modern software tools, and well-trained staff are better positioned to engage in electronic resource sharing than those operating with outdated technologies or limited digital capacity (Arif & Mahmood, 2022; Adebayo & Ahmed, 2023).

Federal University Libraries in Nigeria continue to integrate ICT into their operations, but adoption levels differ significantly across regions due to disparities in funding, infrastructure, and institutional support (Ifijeh & Iwu-James, 2020; Odewale, Adebayo, & Bamidele, 2021). Libraries in the North-East geopolitical zone face uniquely challenging circumstances. Issues such as limited budgetary allocations, unstable power supply, socio-political instability, poor bandwidth, insufficient ICT devices, and inadequate technical support have been repeatedly documented as major constraints to effective library automation and digital service delivery in the region (Bello & Sani, 2023; Jimoh, Abdullahi, & Ibrahim, 2019). These constraints directly affect the ability of Federal University Libraries to participate in electronic resource sharing, a practice that requires stable networks, interoperable systems, consistent ICT maintenance, and institutional policies that support collaboration (Musa & Ismail, 2021; Obasi & Onwuka, 2022).

**Statement of the Problem**

Effective electronic resource sharing is vital for expanding access to scholarly information, promoting collaboration among academic institutions, and supporting teaching, learning, and research in universities. In the digital era, academic libraries are expected to rely on functional Information and Communication Technology (ICT) facilities to participate in shared digital platforms and scholarly networks. The availability of adequate ICT infrastructure, therefore, determines the capacity of university libraries to exchange electronic resources efficiently and to contribute meaningfully to digital scholarly communication. In practice, electronic resource sharing requires reliable internet connectivity, functional library management systems, institutional repositories, servers, digital storage infrastructure, stable power supply, and adequately skilled personnel, supported by enabling institutional policies. However, many Federal University Libraries in Nigeria continue to experience challenges such as inadequate ICT infrastructure, limited bandwidth, insufficient staff ICT competencies, and inconsistent institutional support, which collectively hinder effective electronic resource sharing. These challenges are more pronounced in the North-East geopolitical zone, where limited funding, outdated ICT facilities, poor maintenance culture, unstable power supply, and broader infrastructural and security constraints further affect library operations.

Despite the recognised importance of ICT-enabled electronic resource sharing, there is a lack of empirical evidence that systematically examines the availability of ICT facilities and the specific hindrances affecting electronic resource sharing in Federal University Libraries in North-East Nigeria. Hence, this study assesses the availability of ICT facilities and identifies the hindrances limiting effective electronic resource sharing in Federal University Libraries in North-East Nigeria.

**Research Questions**

The following research questions guided the study:

1. What ICT facilities are available to support collaboration and electronic resource sharing in Federal University Libraries in North-East Nigeria?
2. What challenges hinder collaboration and ICT-driven electronic resource sharing in Federal University Libraries in North-East Nigeria?

**Review of Related Literature**

**ICT Facilities Availability in Federal University Libraries**

A wide-ranging body of empirical research has examined ICT availability in Nigerian and African university libraries, revealing significant variations in infrastructure, system deployment, and technological readiness. Several empirical studies confirm that most university libraries in Nigeria possess basic ICT facilities such as desktop computers, scanners, printers, and basic networking devices. Fatoki (2022) surveyed six Federal University Libraries and found that all institutions had computers, OPAC terminals, and internet access, but noted that these facilities were insufficient relative to user demand. Similarly, Jimoh, Abdullahi, and Ibrahim (2019) found that although computer workstations and LAN were available in Federal University Libraries,

most technologies were outdated and lacked routine maintenance. In a related study in Ghana, Alemna and Adjei (2021) revealed that university libraries possessed computers, cataloguing software, and basic Wi-Fi, but inadequate technical support limited full utilisation. Comparable findings were reported by Dadzie (2009) in South Africa, who noted the availability of foundational ICT tools but emphasised uneven deployment across faculties and departments.

Adebayo and Ahmed (2023) surveyed 12 Nigerian Federal Universities and reported that only 34% had functional institutional repositories, while fewer than 25% operated high-capacity servers capable of supporting large-scale digital operations. They concluded that advanced ICT systems are scarce and poorly maintained. Mushi and Shemahonge (2021) also reported that only a small percentage of libraries in Kenya possessed digital preservation systems and cloud-based services required for resource sharing.

Bandwidth quality consistently emerges as a major variable in ICT availability. In a study across seven Nigerian universities, Musa and Ismail (2021) found that bandwidth was insufficient for e-resource access in 71% of libraries surveyed. They attributed this to low internet subscription plans and unstable connectivity. Comparable findings were reported by Shibanda and Wema (2022) in Kenya, who observed that low bandwidth prevented several universities from accessing shared databases efficiently. Empirical studies consistently show that limited staff ICT competence affects ICT utilisation. Tetteh and Armah (2021) reported that librarians in Ghana lacked adequate skills for managing digital repositories, performing metadata creation, or administering e-resources, leading to underutilisation of ICT tools. In Nigeria, Omekwu and Okoye (2021) found that although many librarians were familiar with basic ICT tools, only 18% demonstrated proficiency in advanced systems such as ILS administration, database configuration, or digital licensing competencies essential for resource sharing. Odewale et al. (2021) similarly reported ICT competency gaps among librarians in Federal Universities, concluding that systematic training is urgently needed.

Empirical evidence indicates significant disparities across Nigerian regions. Fatoki (2022) found that universities in the South-West possessed more advanced ICT facilities compared to those in the North-East and North-Central. The review showed that while basic ICT facilities exist in most Federal University Libraries, advanced systems such as repositories, servers, federated search tools, and cloud-based services are scarce. Bandwidth limitations and low staff ICT skills further reduce effective utilisation. These findings suggest that ICT availability in North-East Federal University Libraries remains insufficient to support robust electronic resource sharing.

**Hindrances to Electronic Resource Sharing in Academic Libraries**

Several studies address the challenges hindering electronic resource sharing. Empirical studies reveal multidimensional constraints spanning from technological, institutional, financial, policy-related, human, and environmental domains. Musa and Ismail (2021) found that poor internet connectivity and outdated hardware hindered 76% of Nigerian libraries from accessing consortia resources. Arif and Mahmood (2022) similarly reported that inadequate server capacity and obsolete systems prevented smooth interoperability of digital platforms across institutions. In Tanzania, Kiondo (2004) found that the lack of modern ICT systems significantly affected

participation in interlibrary collaboration networks. Okore and Ekon (2021) reported that the lack of backup servers and unreliable power supply disrupted digital services and discouraged institutions from participating in resource-sharing initiatives.

Empirical studies consistently link inadequate funding with limited electronic resource sharing. Owolabi and Makinde (2019) found that subscription fees for electronic databases and consortia participation were prohibitive for many Nigerian universities. Shibanda and Wema (2022) reported similar findings in Kenya, noting that financial constraints reduced the ability of libraries to upgrade ICT infrastructure or purchase shared databases. Alemna and Adjei (2021) also confirmed that unreliable library funding directly affected licensing agreements, database renewals, and subscriptions, all essential for resource sharing.

Obasi and Onwuka (2022) found that many Nigerian universities lacked formal ICT collaboration policies, resulting in fragmented or unsustained resource-sharing efforts. Corrall and Pinfield (2014) noted that successful resource-sharing systems depend on strong institutional policies governing licensing, interoperability, and digital rights management areas, where many Nigerian institutions are deficient. Kiondo (2004) also observed in Tanzania that the absence of coordinated collaboration policies led to duplication of efforts, low trust, and weak interlibrary cooperation. A recurrent empirical finding is that inadequate ICT skills among librarians hinder electronic resource sharing. Tetteh and Armah (2021) found that a majority of librarians lacked the technical competence needed to manage shared systems. Omekwu and Okoye (2021) similarly identified low ICT literacy and resistance to new technologies as reasons behind the low adoption of digital services. These findings are strengthened by Odewale et al. (2021), who reported that staff ICT skills significantly predicted the success of electronic resource-sharing initiatives.

Limited awareness of resource-sharing opportunities reduces utilisation and institutional support. Ankrah and Atuase (2018) found that students and academic staff in Nigerian universities were unaware of consortia services and shared e-resources available to them. This lack of awareness reduced demand, which in turn limited institutional motivation to invest in resource-sharing platforms. These environmental factors also limited staff mobility for training, consortia meetings, and implementation workshops. Copyright laws and restrictive database licenses limit the extent of digital resource sharing. Borrego and Anglada (2016) empirically found that licensing restrictions were among the top barriers preventing libraries from engaging in interlibrary digital lending and collaborative database purchases.

Moreover, global studies continue to show that successful electronic resource sharing is influenced by multiple variables, including ICT infrastructure readiness, organisational culture, digital skills of staff, leadership support, funding, and the regulatory environment (Thanuskodi, 2011; Okello-Obura & Magara, 2008; Owolabi & Makinde, 2019). In developing countries, digital inequality and technological limitations often compound these challenges, resulting in slower adoption of digital resource-sharing initiatives and poor interoperability between library systems (Tetteh & Armah, 2021; Dadzie, 2009). Within Nigeria, the situation is intensified by inconsistent ICT policies, fragmented national digital strategies, licensing restrictions, and persistent gaps in ICT literacy among library staff (Okore & Ekon, 2021; Omekwu & Okoye, 2021).

Although numerous studies have examined ICT adoption and utilisation in Nigerian

academic libraries, fewer empirical investigations have focused specifically on the dual issues of ICT availability and the hindrances affecting electronic resource sharing in Federal Universities in North-East Nigeria (Adebayo & Ahmed, 2023; Fatoki, 2022). The literature reviewed showed that hindrances to electronic resource sharing are multidimensional. The most severe barriers in the Nigerian and African context include poor ICT infrastructure, insufficient funding, low staff ICT skills, weak institutional policies, limited awareness, and environmental/security-related constraints. Their findings highlight the legal constraints inherent in digital content sharing. These hindrances are more pronounced in the North-East region, where infrastructural and socio-economic challenges persist.

**Research Methodology**

The study adopted a survey research design to obtain systematic information on the forms of collaboration and the challenges affecting ICT-driven resource sharing among Federal University Libraries in North-East Nigeria, a design considered appropriate for examining existing practices and institutional behaviours (Ilori & Onanuga, 2022; Dillman, Smyth, & Christian, 2014). The population comprised 344 library staff across the Federal University Kashere Library, ATBU Library, and the Ramat Library of the University of Maiduguri, and a census sampling technique was used since the population was accessible and manageable (Borg & Gall, 2007). Data were collected using a structured questionnaire covering collaboration types, collaborative practices, ICT-enabled interactions, and challenges hindering resource sharing; its content validity was confirmed through expert review, and reliability was determined, yielding a Cronbach's alpha internal consistency reliability coefficient of 0.782, which meets the recommended reliability threshold (Nunnally, 1978). Data collection was conducted over three weeks with the assistance of six trained fieldworkers after obtaining institutional approval, and ethical procedures such as informed consent and confidentiality were observed. The data were analysed using descriptive statistics, frequencies and percentages and results were presented in tables, in line with Creswell and Creswell's (2018) recommendations for survey research.

**Results**

**Research Question 1: What ICT Facilities are Available in Federal University Libraries in North-East Nigeria?**

The study assessed the availability of ICT facilities in Federal University Libraries across North-East Nigeria. Data collected from 344 respondents revealed significant adoption of foundational ICT infrastructure, as summarised in Table 1.

**Table 1: Availability of ICT Facilities in Federal University Libraries (N = 344)**

| S/N | ICT Facilities | Available (n, %) | Not Available (n, %) |
|---|---|---|---|
| 1 | Computers for users | 312 (90.7%) | 32 (9.3%) |
| 2 | Internet connectivity (Wi-Fi/Ethernet) | 325 (94.5%) | 19 (5.5%) |
| 3 | Online Public Access Catalogue (OPAC) | 290 (84.3%) | 54 (15.7%) |
| 4 | Access to e-books and e-journals | 305 (88.7%) | 39 (11.3%) |
| 5 | Digital scanners and photocopiers | 274 (79.7%) | 70 (20.3%) |
| 6 | Institutional repositories | 268 (77.9%) | 76 (22.1%) |
| 7 | Audio-visual facilities | 258 (75.0%) | 86 (25.0%) |
| 8 | ICT training labs | 276 (80.2%) | 68 (19.8%) |
| 9 | Library management software | 308 (89.5%) | 36 (10.5%) |
| 10 | Subscription to specialised databases (JSTOR, ProQuest) | 261 (75.9%) | 83 (24.1%) |

The results indicated that basic ICT facilities such as internet connectivity (94.5%), computers for users (90.7%), and library management software (89.5%) are widely available. Access to e-books and e-journals (88.7%) and OPAC systems (84.3%) further highlight the libraries' efforts to modernise cataloguing and digital content delivery. These findings align with prior studies indicating that foundational ICT infrastructure supports library operations and electronic resource sharing (Adeleke & Olorunsogo, 2020; Fatoki, 2022; Dadzie, 2009).

Availability of ICT training labs (80.2%), digital scanners and photocopiers (79.7%), and institutional repositories (77.9%) reflects moderate investment in capacity building and digital preservation initiatives, which are critical for supporting scholarly communication (Yaacob, Singh, & Aziz, 2020). Audio-visual facilities (75.0%) and subscriptions to specialised databases (75.9%) were less prevalent but still substantial, suggesting emerging integration of advanced ICT tools in library services.

The findings demonstrate that Federal University Libraries in North-East Nigeria have established foundational ICT facilities necessary for electronic resource sharing and modern library service delivery. However, the lower availability of advanced digital tools and specialised databases indicates gaps in aligning with global standards of ICT-enabled library operations (Arif & Mahmood, 2022).

**Research Question 2: What are the Challenges of Collaboration and Resource Sharing in Federal University Libraries in North-East Nigeria?**

The study further examined the challenges hindering collaboration and resource sharing. Responses were captured on a four-point Likert scale (Strongly Agree to Strongly Disagree). Weighted mean scores were calculated, with items scoring ≥2.8 considered major challenges. Table 2 summarises the findings.

**Table 2: Challenges of Collaboration and Resource Sharing (N = 344)**

| S/N | Statement | SA (n, %) | A (n, %) | D (n, %) | SD (n, %) | Weighted Mean | Decision |
|---|---|---|---|---|---|---|---|
| 1 | Limited funding for collaborative projects | 196 (57.0%) | 102 (29.7%) | 33 (9.6%) | 13 (3.8%) | 3.40 | Major Challenge |
| 2 | Lack of ICT infrastructure to support resource sharing | 180 (52.3%) | 114 (33.1%) | 35 (10.2%) | 15 (4.4%) | 3.33 | Major Challenge |
| 3 | Poor communication and coordination among libraries | 162 (47.1%) | 110 (32.0%) | 49 (14.2%) | 23 (6.7%) | 3.20 | Major Challenge |
| 4 | Inadequate staff training on resource-sharing technologies | 145 (42.2%) | 126 (36.6%) | 54 (15.7%) | 19 (5.5%) | 3.12 | Major Challenge |
| 5 | Institutional policies that hinder collaboration | 130 (37.8%) | 124 (36.0%) | 65 (18.9%) | 25 (7.3%) | 2.98 | Major Challenge |
| 6 | Insufficient awareness of the benefits of collaboration | 150 (43.6%) | 118 (34.3%) | 50 (14.5%) | 26 (7.6%) | 3.09 | Major Challenge |
| 7 | Resistance to change or adoption of new technologies | 138 (40.1%) | 123 (35.8%) | 61 (17.7%) | 22 (6.4%) | 3.04 | Major Challenge |
| 8 | Security concerns regarding shared digital resources | 154 (44.8%) | 121 (35.2%) | 48 (14.0%) | 21 (6.1%) | 3.10 | Major Challenge |
| 9 | Geographical and logistical challenges | 147 (42.7%) | 128 (37.2%) | 46 (13.4%) | 23 (6.7%) | 3.10 | Major Challenge |

**Findings of the Study**

The results indicate that limited funding (86.7% SA + A) is the most critical barrier to collaboration, reflecting chronic financial constraints in North-East Nigerian universities, consistent with Musa and Ismail (2021) and Owolabi and Makinde (2019). Despite the availability of foundational ICT facilities, the lack of ICT infrastructure for resource sharing (85.4% SA + A) remains a major challenge, suggesting that bandwidth limitations, interoperability issues, and outdated systems restrict effective collaboration (Arif & Mahmood, 2022; Bello & Sani, 2023).

Other significant challenges include poor communication and coordination (79.1%), inadequate staff training (78.8%), and institutional policy barriers (73.8%), indicating organisational and human resource factors that impede collaborative initiatives. These findings align with Omekwu and Okoye (2021) and Obasi and Onwuka (2022), highlighting that coordination mechanisms, supportive policies, and human capacity are critical enablers of ICT-driven resource sharing. Cultural and technical barriers, such as resistance to change (75.9%), insufficient awareness of collaboration benefits (77.9%), and security concerns regarding digital resources (80.0%), further constrain resource-sharing practices. Geographical and logistical challenges (79.9%) reflect infrastructural and environmental limitations specific to the North-East region, including poor transport networks and socio-political instability (Bello & Sani, 2023; Kiondo, 2004).

The findings underscore that while foundational ICT facilities exist, advanced collaboration is hindered by multifaceted challenges spanning financial, technical, institutional, human, and environmental domains. This corroborates the literature asserting that successful electronic resource sharing requires robust ICT infrastructure, skilled personnel, supportive policies, funding, and conducive organisational culture (Tetteh & Armah, 2021; Thanuskodi, 2011; Okello-Obura & Magara, 2008).

**Conclusion**

The study further establishes that electronic resource sharing in the region is constrained by interconnected challenges, particularly limited funding, inadequate ICT infrastructure, poor coordination, insufficient staff training, weak institutional policies, security concerns, and geographical constraints. It therefore concludes that despite the availability of basic ICT facilities, effective electronic resource sharing in Federal University Libraries in North-East Nigeria remains limited due to persistent financial, infrastructural, institutional, and capacity-related barriers that require systematic intervention.

**Recommendations**

The following recommendations were proffered:

1. The Federal University Libraries in North-East Nigeria should strengthen and upgrade advanced ICT facilities, particularly internet bandwidth, institutional repositories, specialised databases, servers, and digital equipment, to complement existing foundational infrastructure and support effective electronic resource sharing.
2. The Federal University authorities and library management should address identified barriers by providing dedicated funding, improving ICT infrastructure, enhancing staff ICT training, strengthening institutional policies, improving inter-library coordination, and implementing security and change-management strategies to facilitate sustainable electronic resource sharing.

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