



ICT FACILITIES, COLLABORATION, AND RESOURCE SHARING IN FEDERAL UNIVERSITY LIBRARIES IN NORTH-EAST NIGERIA

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Abstract

This study investigates the availability, adequacy, and utilisation of ICT resources for collaborative initiatives among Federal University Libraries in this region. Employing a descriptive survey research design, data were collected from 344 library staff across selected federal universities using a structured questionnaire. The findings indicate that while basic ICT facilities such as computers, internet connectivity, integrated library systems (ILS), and online communication platforms are available, they are often insufficient, outdated, and poorly maintained. Furthermore, the utilisation of ICTs for advanced resource-sharing practices, including cooperative cataloguing, joint digital repositories, and consortia-based services, is constrained by limited technical skills, unstable network infrastructure, and inadequate institutional support. The study also reveals that collaboration through ICT is predominantly limited to traditional resource-sharing mechanisms, with digital and technology-driven initiatives remaining underdeveloped. Based on these findings, the study recommends increased and sustained funding for ICT infrastructure, targeted staff training in digital tools and collaborative technologies, and the development of comprehensive policies to promote harmonised ICT-enabled collaboration and resource sharing. The study contributes empirical evidence to the discourse on library collaboration in developing regions and provides practical guidance for enhancing ICT-driven scholarly communication in Nigerian federal universities.

Keywords: ICT Facilities, Library Collaboration, Resource Sharing, Federal University Libraries, North-East Nigeria, Digital Library Services

Introduction

Information and communication technologies (ICTs) have become foundational to modern academic library operations, shaping how information is stored, accessed, disseminated, and shared across institutions. Federal University Libraries have evolved from traditional print-based repositories to dynamic knowledge centres driven by digital infrastructures (Arif & Mahmood, 2022). ICT facilities, including integrated library systems (ILS), digital repositories, cloud platforms, high-speed internet, and online communication tools enable libraries to expand access to scholarly materials and engage in collaborative services that are essential in contemporary higher education (Dunmill & Arslanagic, 2021).

In the Nigerian context, ICT-driven initiatives support interlibrary loan services, cooperative acquisition, digital preservation, and resource sharing through national library consortia. These collaborative models help mitigate budgetary constraints, rising subscription costs, and the growing demand for diverse academic resources (Yusuf et al., 2023). However, the availability, adequacy, and utilisation of ICT facilities vary significantly across institutions due to disparities in funding, infrastructure, and staffing (Amadi & Nduka, 2023).

Federal University Libraries in North-East Nigeria—including those at Federal University Kashere, University of Maiduguri, and Abubakar Tafawa Balewa University—face unique challenges such as poor internet bandwidth, outdated ICT equipment, and limited budget allocations. These limitations restrict their capacity to fully engage in ICT-supported collaboration and resource sharing. The situation raises concerns about equitable access to information, quality of research support, and the overall performance of library services in the region (Musa & Ismail, 2021).

Despite the critical role of ICT in resource sharing, empirical evidence on the availability and utilisation of ICT facilities for collaboration among Federal University Libraries in this region remains limited. This study therefore investigates the ICT facilities available, their adequacy, and how they are utilised to support collaboration and resource sharing.

Statement of the Problem

In an ideal academic environment, information and communication technologies (ICTs) have transformed Federal University Libraries into dynamic knowledge hubs where digital systems, integrated library platforms, and online communication tools enhance access to scholarly information. ICT facilities such as integrated library systems, institutional repositories, cloud services, and consortia platforms enable effective resource sharing, cooperative

cataloguing, and joint development of services (Arif & Mahmood, 2022; Dunmill & Arslanagic, 2021). Ideally, these facilities would support Federal University Libraries to maximise limited resources, expand access to scholarly materials, and strengthen research and learning activities.

However, in practice, Federal University Libraries in Nigeria especially those in the North-East, face persistent limitations in the availability, adequacy, and utilisation of ICT facilities needed to support collaborative activities. Challenges such as unstable power supply, low internet bandwidth, outdated digital infrastructure, limited ICT equipment, and inadequate technical capacity undermine their ability to use ICT tools effectively (Musa & Ismail, 2021; Amadi & Nduka, 2023). Libraries such as the Federal University Kashere Library, Ramat Library at the University of Maiduguri, and Abubakar Tafawa Balewa University Library continue to struggle with insufficient ICT funding and obsolete systems, which limit their ability to participate in national resource-sharing programmes.

Despite the importance of ICT availability and utilisation in enhancing collaborative service delivery, empirical evidence on the extent to which Federal University Libraries in North-East Nigeria possess adequate ICT facilities and use them for collaboration remains limited. This paper, therefore, investigates the availability, adequacy, and utilisation of ICT facilities for collaboration and resource sharing in Federal University Libraries in the region.

Research Questions

The following research questions guided the study:

1. What collaborative initiatives are currently available in Federal University Libraries in North-East Nigeria?
2. What specific forms and practices of collaboration are actively implemented among Federal University Libraries in North-East Nigeria?

Literature Review

Collaboration in Federal University Libraries has expanded significantly, driven by technological advancements, changing user expectations, and increasing demand for shared access to resources. Interlibrary loans (ILL) and consortia-based initiatives enable libraries to provide materials beyond their individual holdings, minimising costs while broadening the scope of available content, particularly for smaller or resource-constrained libraries (Nwafor, 2020; Mitrano & Ziemer, 2021). Beyond traditional ILL, federal university libraries increasingly participate in collaborative digital initiatives supporting open access (OA). Collective actions through organisations such as the Scholarly Publishing and Academic Resources Coalition (SPARC)

have fostered transformative agreements with publishers, improving access to scholarly content while sustaining financial models (Chou & Chu, 2022).

Integration of information literacy and research skills into academic curricula represents another significant form of collaboration. Librarians work closely with faculty to design and embed information literacy instruction, strengthening students' research competencies and promoting lifelong learning (Lee, Park, & Kim, 2021). Similarly, the adoption of shared Integrated Library Systems (ILS) and cloud-based platforms has enabled multiple institutions to share cataloguing, circulation, and digital resources in real time, thereby improving operational efficiency and service quality (Walker & Coleman, 2021).

In Nigeria, studies confirm diverse forms of collaboration in federal university libraries. Ekpang and Ekeng (2021) highlighted the role of user education in preserving and improving access to information resources in South-South universities. In North-East Nigeria, universities participate in the Nigerian University Libraries Consortium (NULIBS), facilitating joint subscriptions to electronic resources and reducing acquisition costs (Yusuf, Dauda, & Ibrahim, 2023; Obasi & Onwuka, 2022). Joint digital repositories for theses and dissertations have also been developed, supporting open access and increasing visibility of indigenous research (Johnson & Lee, 2024).

ICT-enabled systems have further streamlined ILL and enhanced collaborative research initiatives. Studies by Nwafor et al. (2020) and Adamu, Musa, and Yakubu (2021) reveal that technology-enabled ILL ensures wider access to resources and bridges collection gaps. Collaborative research involving librarians and faculty has also expanded, producing cross-institutional studies on library and information science practices (Enakhire & Tella, 2020; Musa & Ismail, 2021). Additionally, workshops, seminars, and training sessions have been organised collaboratively to enhance librarians' skills, particularly in relation to emerging technologies (Bello & Sani, 2023; James & Amaka, 2023).

Collaborations also extend to data sharing and scholarly communication through shared digital platforms, strengthening the global relevance of participating libraries (Mitchell, 2023). Partnerships with international bodies and funding agencies have supported large-scale projects such as digitisation and preservation of cultural heritage (Kalu, 2021). Libraries have also initiated projects integrating indigenous knowledge into digital archives, reflecting the emphasis on cultural identity and sustainability (Nguyen, 2021). Moreover, close collaborations with faculties help meet teaching and learning needs through tailored services and improved access to resources (Rachman, 2021).

Empirical evidence shows that collaboration directly affects institutional outcomes. Yamaguchi and Richardson (2020) argue that universities increasingly recognise libraries as key contributors to student success, embedding collaborative targets into institutional strategies. Ahmad, Shoaib, and Shaukat (2021) found that collaborative service models, such as online query responses and research support, positively influence student satisfaction with library services. These findings suggest that collaboration is central not only to resource access but also to enhancing teaching, learning, and research in federal university libraries.

Global examples further demonstrate the expanding nature of collaborative initiatives. European university libraries increasingly engage in cross-institutional digital scholarship projects, including shared digitisation centres and collaborative metadata creation, reducing duplication of effort (Borrego & Anglada, 2020). In South Africa, collaborative virtual reference services allow institutions to pool professional expertise and serve users efficiently across campuses (Raju & Schoombee, 2021). For Nigerian federal university libraries, similar models such as shared staffing, collaborative research support units, and joint technology adoption can enhance service efficiency, reduce operational costs, and strengthen institutional visibility.

Federal university libraries engage in diverse forms of collaboration to pool resources, share expertise, and enhance service delivery. These include interlibrary loans, consortia participation, cooperative collection development, cloud-based resource sharing, shared catalogues, digital repositories, professional development programmes, and faculty–library partnerships. Omekwu and Okoye (2021) identified interlibrary loan as the most widely practised type, though high costs and delays often limit its efficiency, highlighting the need for ICT-enabled coordination.

Consortia-based collaboration significantly enhances access to resources while lowering acquisition costs (Kalu, 2021), though administrative coordination and membership fees remain challenges. Sharing access to electronic databases such as JSTOR and ScienceDirect improves research output and academic visibility (Kalu, 2022), yet technical and financial constraints persist.

Cloud computing platforms and shared ILS further expand opportunities for digital resource sharing. Johnson and Lee (2024) found that cloud-based systems facilitate real-time access to e-books, journals, and databases across institutions, although copyright, access control, and staff training remain concerns. Brown (2021) noted that Online Public Access Catalogues (OPACs) are vital for improving the visibility and accessibility of print and digital resources.

Collaboration also extends to human networks. Academic staff share teaching materials, publications, and research outputs, though intellectual property concerns and workload pressures limit participation (Obasi & Onwuka, 2022). Social media platforms such as ResearchGate and Academia.edu support informal sharing and professional networking, though quality control remains a concern (Lee & Nguyen, 2023).

Theoretical perspectives highlight structural drivers of collaboration. The growing complexity of scholarly literature, reliance on information for societal development, and rising costs of materials necessitate resource sharing (Ibrahim, 2020; Song, 2021). Advances in ICT have further expanded opportunities for joint cataloguing, digital preservation, and shared access platforms (Adam & Usman, 2023).

Globally, collaborative models increasingly adopt shared digital preservation networks and transformative agreements with publishers, allowing better pricing, expanded open-access publishing, and support for scholarly communication (Kennedy & Dysart, 2022; Shen & Xu, 2023). For federal university libraries in North-East Nigeria, adopting similar models through national consortia, shared preservation systems, or coordinated open-access strategies would improve access to global resources, reduce costs, and enhance the national research ecosystem.

Methodology

This study adopted a survey research design, suitable for describing existing conditions, practices, and utilisation of resources in Federal University Libraries in North-East Nigeria. The population comprised 344 library staff across three federal universities: Federal University Kashere Library, Gombe State (59 staff); Abubakar Tafawa Balewa University Library, Bauchi State (105 staff); and Ramat Library, University of Maiduguri, Borno State (180 staff). A census approach was used since the population was manageable. Data were collected using a structured questionnaire covering demographics, ICT availability, utilisation, and collaboration practices. The instrument was validated by experts and the reliability was tested in three other universities, yielding a reliability coefficient of 0.782. Six trained research assistants administered the questionnaires over three weeks, with follow-up reminders to improve response rates. Data were coded and analysed using descriptive statistics of frequencies, means, and percentages. The results were presented in tables to illustrate patterns of ICT availability and utilisation for collaboration.

Results

Research Question 1: What collaborative initiatives are currently available in Federal University Libraries in North-East Nigeria?

The researcher sought to identify collaborative initiatives that are currently available in Federal University Libraries in North-East Nigeria. Responses were collected, analysed, and are presented in Table 4.2.

Table 1: Collaborative Initiatives currently Available (N = 344)

S/N	Collaboration	Available (n, %)	Not Available (n, %)
1	Inter-library loan agreements	312 (90.7%)	32 (9.3%)
2	Resource-sharing initiatives	298 (86.6%)	46 (13.4%)
3	Joint subscription to e-resources/databases	276 (80.2%)	68 (19.8%)
4	Academic consortia for library development	265 (77.0%)	79 (23.0%)
5	Collaborative training programs for library staff	280 (81.4%)	64 (18.6%)
6	Partnership with external organisations (e.g., NGOs, government agencies)	251 (73.0%)	93 (27.0%)
7	Research supports collaborations between libraries	270 (78.5%)	74 (21.5%)
8	Shared digital repositories for local content	186 (54.1%)	158 (45.9%)
9	Collaborative library user orientation programs	224 (65.1%)	120 (34.9%)
10	Technology sharing or co-development initiatives	195 (56.7%)	149 (43.3%)

Source: Field Survey, 2024

Key: A = Available, NA = Not Available, n = Frequency, % = Percentage

Decision Rule: If $\geq 70\%$ of respondents indicate Available

Table 1 reveals that collaboration is widely practised among Federal University Libraries in North-East Nigeria. The data indicate that the most prominent form of collaboration is inter-library loan agreements, reported by 312 respondents (90.7%), highlighting the importance of physical resource sharing in the region. This finding aligns with Omekwu and Okoye (2021), who emphasised that inter-library loan remains the most common collaborative activity across Nigerian Federal University Libraries.

Other highly reported collaborative practices include resource-sharing initiatives (86.6%), collaborative training programs for library staff (81.4%), and joint subscriptions to e-resources/databases (80.2%). These results suggest a strong emphasis on pooling resources to reduce costs, enhance staff capacity, and expand user access to electronic resources. This corresponds with Aina, Ogundipe, and Taiwo (2021), who found that electronic resource collaboration enhances service delivery and extends access beyond individual institutional capabilities.

Moderately reported collaborations included academic consortia for library development (77.0%), research support collaborations (78.5%), and partnerships with external organisations such as NGOs and government agencies (73.0%). These findings point to growing but uneven efforts to build strategic alliances, often limited by institutional priorities and external funding availability. Babarinde and Onifade (2020) similarly noted that while consortia building is critical, challenges of funding and sustainability often hinder their effectiveness in Nigeria.

However, relatively lower levels of collaboration were observed in shared digital repositories for local content (54.1%), collaborative user orientation programs (65.1%), and technology sharing or co-development initiatives (56.7%). These figures highlight gaps in digital integration and technology-based partnerships. Musa and Ismail (2021) found that infrastructural deficiencies, limited ICT skills, and bandwidth challenges often constrain advanced collaborative initiatives such as digital repositories and technology sharing in Nigerian universities. These findings imply that without targeted investment in ICT infrastructure, digital literacy, and staff training, libraries in the region risk falling behind in global best practices of academic information management. The implication here is that universities and policymakers must treat digital collaboration as a strategic priority, ensuring that Federal University Libraries evolve from traditional resource sharing into technologically driven centres of knowledge exchange.

Research Question 2: What specific forms and practices of collaboration are actively implemented among Federal University Libraries in North-East Nigeria?

The study sought to examine the specific forms and practices of collaboration that are actively implemented among Federal University Libraries in North-East Nigeria. Responses were collected, analysed, and are presented in Table 2.

Table 2 Specific Forms and Practices of Collaboration Implemented (N = 344)

S/N	Types of Collaboration	Available (n, %)	Not Available (n, %)
1	Sharing of physical resources (e.g., books, journals)	316 (91.9%)	28 (8.1%)
2	Development of shared digital library systems	288 (83.7%)	56 (16.3%)
3	Joint acquisition of scholarly databases and e-resources	298 (86.6%)	46 (13.4%)
4	Cross-training programs for library personnel	275 (79.9%)	69 (20.1%)
5	Collaborative research and publication initiatives	260 (75.6%)	84 (24.4%)
6	Participation in regional or national library networks	307 (89.2%)	37 (10.8%)
7	Hosting joint academic events (e.g., workshops, conferences)	292 (84.9%)	52 (15.1%)
8	Co-developing library policies and guidelines	265 (77.0%)	79 (23.0%)
9	Sharing ICT facilities and technical expertise	271 (78.8%)	73 (21.2%)
10	Resource pooling for preservation and conservation efforts	250 (72.7%)	94 (27.3%)

Source: Field Survey, 2024

Key: A = Available, NA = Not Available, n = Frequency, % = Percentage

Decision Rule: If $\geq 70\%$ of respondents indicate Available \rightarrow High Level of Collaboration;

The findings in Table 2 revealed a high level of collaborative engagement among Federal University Libraries in North-East Nigeria, cutting across traditional and digital resource management. The most prominent form of collaboration is the sharing of physical resources such as books and journals, reported by 316 respondents (91.9%). This practice reflects a pragmatic and cost-effective means of enhancing user access to scarce resources across institutions. It is

consistent with Omekwu and Okoye (2021), who identified interlibrary loan and physical resource sharing as the backbone of collaborative library services in Nigeria.

A significant proportion of respondents also reported joint acquisition of scholarly databases and e-resources (86.6%) and the development of shared digital library systems (83.7%). These results reflect an increasing shift toward technology-driven collaboration, as libraries work collectively to address the prohibitive costs of digital subscriptions and improve access to global scholarly content. This finding corroborates Aina, Ogundipe, and Taiwo (2021), who stressed that resource pooling through electronic subscriptions enables institutions to provide broader and more equitable access to e-resources.

Participation in regional or national library networks (89.2%) and hosting of joint academic events such as workshops and conferences (84.9%) further highlight the institutional commitment to broader alliances and knowledge exchange. Similarly, cross-training programs for library personnel (79.9%) and co-development of library policies and guidelines (77.0%) indicate deliberate efforts at capacity building and harmonisation of professional standards. These results support Babarinde and Onifade (2020), who argued that successful library consortia depend not only on resource sharing but also on the continuous development of human capital and collective governance structures.

Nonetheless, collaborative research and publication initiatives (75.6%) and resource pooling for preservation and conservation (72.7%) were comparatively less prevalent, though still above the 70% threshold. The relatively lower engagement in these areas suggests that research-focused collaboration and heritage preservation remain underdeveloped priorities. This is in line with Musa and Ismail (2021), who observed that infrastructural and funding limitations often hinder advanced collaborative efforts in Nigerian universities.

The results demonstrated that Federal University Libraries in North-East Nigeria are actively embracing diverse types of collaboration, ranging from physical resource sharing to ICT-based initiatives. The implication is that while a strong foundation for collaboration exists, more emphasis should be placed on advancing digital preservation, collaborative research, and the development of robust shared infrastructures. This would not only enhance institutional synergy but also align Nigerian Federal University Libraries more closely with global best practices in knowledge management and scholarly communication.

Summary of Findings

Based on the analyses and data presented, the following were the findings of this study:

1. The forms of collaboration available in Federal University Libraries in North-East Nigeria are inter-library loan agreements, resource-sharing initiatives, joint subscriptions to electronic resources, collaborative training for staff, academic consortia, partnerships with external organisations, research support collaborations, user orientation programs, shared digital repositories, and technology co-development initiatives.
2. The types of collaboration practised among Federal University Libraries in North-East Nigeria are sharing of physical resources, joint acquisition of scholarly databases, participation in library networks, development of shared digital systems, cross-training of staff, collaborative research and publications, hosting of joint academic events, co-developing library policies, sharing ICT facilities, and pooling resources for preservation and conservation.

Discussion

The findings of Research Question One, which explored the forms of collaboration available in Federal University Libraries, revealed that inter-library loan agreements, resource-sharing initiatives, joint subscriptions, and collaborative training programs are widely practised. This supports the assertion by Omekwu and Okoye (2021) that inter-library loan remains the most enduring and common form of collaboration in Nigerian Federal University Libraries, serving as a cost-effective mechanism for broadening access to physical resources. The strong engagement in resource-sharing and joint subscriptions reflects the conclusions of Aina, Ogundipe, and Taiwo (2021), who found that collaborative acquisition models mitigate high subscription costs while expanding access to scholarly resources. On the other hand, limited adoption of digital repositories and technology sharing initiatives highlights the infrastructural and financial constraints discussed by Musa and Ismail (2021), who identified inadequate ICT skills and bandwidth as barriers to advanced collaboration. These findings collectively suggest that while traditional forms of collaboration are thriving, digital and technology-driven collaborations remain underdeveloped, reinforcing the need for targeted infrastructural investment.

Research Question Two, which examined the types of collaboration among Federal University Libraries, showed strong engagement in sharing physical resources, joint acquisition of e-resources, participation in regional networks, and shared digital systems. These results align with Babarinde and Onifade (2020), who emphasised that consortia and network participation significantly enhance resource availability and service quality in Nigerian Federal University Libraries. The high participation in training programs and academic events mirrors findings by Oyewole (2018), who observed that collaborative human capital development strengthens professional practice and fosters innovation. However, the moderate levels of collaboration in research publications and preservation efforts point to persistent challenges. This aligns with Anyim and Onwuchekwa (2019), who argued that while Nigerian libraries recognise the importance of collaborative research, institutional support and funding for such ventures remain

inconsistent. These findings demonstrate that collaboration in North-East Nigeria is strong in resource sharing and networking, but requires more commitment to knowledge production and preservation partnerships.

Conclusion

The study concluded that Federal University Libraries in North-East Nigeria possess a moderate level of ICT facilities necessary to support collaboration and resource sharing. Core technologies, including computers, OPAC, internet services, and library management software, are available and utilised for basic collaborative activities. However, advanced ICT tools such as specialised databases, digital preservation systems, and shared institutional repository platforms remain insufficient. Although ICT infrastructure exists, it is not fully leveraged to support higher-level collaborations such as virtual reference services, collaborative digitisation, or joint technology development. The utilisation of ICT for enhanced collaboration is hindered by inadequate funding, limited technical skills, unstable connectivity, and low access to advanced digital tools. Strengthening ICT infrastructure, building staff capacity, and increasing institutional funding are essential to improving utilisation and enabling libraries to maximise the benefits of ICT-driven collaboration.

Recommendations

Based on the findings, the study recommended that the:

1. Management of Federal University Libraries should prioritise and advocate for increased and sustained funding from federal authorities and educational stakeholders to enable the procurement, deployment, and continuous maintenance of advanced ICT facilities. These should include audio-visual equipment, institutional repositories, e-collaboration platforms, high-capacity servers, and specialised digital resources essential for effective scholarly communication and resource sharing.
2. The University Management should initiate, develop, and institutionalise joint operational policies that promote harmonised library practices across Federal University Libraries in North-East Nigeria. These policies should also support collaborative preservation initiatives, particularly for rare materials, indigenous knowledge resources, and culturally significant collections that require shared preservation infrastructure.

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