Leveraging Digital Tools for Users' Satisfaction in Libraries of Agriculture and Research Institutes in Nigeria

By

Razika Mohammed Yahaya PhD (CLN)

College Librarian, Jigawa State College of Education and Legal Studies, Ringim

yahayarazika@gmail.com

+2348023727144

Abstract

This study investigates the role of digital tools in enhancing user satisfaction in libraries of agricultural and research institutes in Nigeria. Using a descriptive survey design, data were collected from 250 respondents including researchers, students, extension workers, and librarians. Findings revealed that e-journals, databases, and online catalogues were the most widely available and frequently used digital tools, contributing significantly to user satisfaction. However, persistent challenges such as poor internet connectivity, unstable electricity supply, inadequate funding, and limited training hinder optimal utilization. The study concludes that digital tools play a crucial role in improving access to information and user satisfaction, but infrastructural and capacity deficits remain barriers. Recommendations include improved funding, infrastructural investment, staff training, user education, and enhanced collaboration across institutions.

Keywords: digital tools, user satisfaction, agricultural libraries, research institutes, Nigeria

Introduction

Libraries in agricultural and research institutes play a vital role in advancing knowledge creation, dissemination, and application for national development. In Nigeria, these libraries serve as hubs for scientists, extension workers, students, and policymakers who rely on timely and relevant information to address pressing agricultural and research challenges (Yahaya, 2019). Traditionally, access to information was largely print based, often limiting the speed and scope of service delivery. However, the rapid growth of digital technologies has transformed how information is generated, stored, and accessed globally (Ezeala, 2011).

Digital tools such as online databases, electronic journals, institutional repositories, mobile applications, and automated catalogues have introduced new opportunities for libraries to enhance service delivery and improve user satisfaction (Institutional Repository Studies, 2024; IITA Library, 2023). By enabling remote access, quick retrieval of scholarly resources, and interactive learning platforms, these technologies align with the needs of modern users who demand convenience, efficiency, and relevance (Oluwaseun, 2025; Yahaya, 2022)

Despite these prospects, agricultural and research libraries in Nigeria face persistent challenges, including inadequate ICT infrastructure, low funding, insufficient staff training, and varying levels of digital literacy among users (Adeleke, 2022; IITA Library, 2023). Addressing these issues is critical to ensuring that digital tools are effectively leveraged to boost research

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productivity, knowledge transfer, and innovation in the agricultural sector (Recent Perspectives on AI in Libraries, 2025).

Statement of the Problem

In recent years, libraries in agricultural and research institutes worldwide have increasingly adopted digital tools to improve service delivery and enhance user satisfaction (Institutional Repository Studies, 2024). However, in Nigeria, the effective utilization of such tools remains a challenge. Users often face difficulties in accessing digital resources due to poor infrastructure, unstable internet connectivity, inadequate funding, and insufficient training of both staff and patrons (Ezeala, 2011; IITA Library, 2023; Adeleke, 2022). These limitations not only reduce user satisfaction but also constrain the role of libraries in supporting agricultural research, innovation, and knowledge dissemination (Yahaya, 2019). While digital tools hold great potential for transforming library services, little is known about the extent to which they are currently leveraged to meet the needs of users in Nigerian agricultural and research institutes (Oluwaseun, 2025). This gap underscores the need for an empirical investigation into how digital tools contribute to user satisfaction and how challenges hindering their effective deployment can be addressed (Recent Perspectives on AI in Libraries, 2025).

Research Objectives

The main objective of this study was to examine how digital tools are leveraged to enhance user satisfaction in libraries of agricultural and research institutes in Nigeria. The specific objectives were to:

1. Identify the types of digital tools currently available and utilized in agricultural and research libraries in Nigeria.
2. Assess the extent to which digital tools contribute to user satisfaction in these libraries.
3. Examine the challenges hindering the effective utilization of digital tools by users and library staff.
4. Suggest strategies for improving the deployment and use of digital tools to enhance library services and user satisfaction.

Review of Related Literature

Libraries in agricultural and research institutes in Nigeria play a critical role in supporting scientific inquiry, agricultural development, and national food security. With the increasing shift toward digital knowledge environments, these libraries have embraced digital tools such as integrated library systems, electronic databases, institutional repositories, and mobile platforms to improve access and enhance user satisfaction. However, the effectiveness of these tools depends on several contextual factors, including infrastructure, staff competence, and user digital literacy. This review examines the body of literature on the role of digital tools in Nigerian agricultural and research libraries, focusing on their availability, impact on user satisfaction, enabling factors, challenges, and emerging trends.

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Digital Tools and Services in Agricultural Research Libraries

A variety of digital services are now in use within Nigerian agricultural and research libraries. These include computerized catalogues, online public access catalogues (OPACs), institutional repositories, e-journal platforms, and library portals (IITA Library, 2023). Specialized agricultural digital resource hubs also support knowledge sharing among researchers and extension agents (Oluwaseun, 2025). Such tools enable real-time access to literature, provide greater visibility for local research outputs, and facilitate collaboration across institutions.

Institutional repositories, in particular, have become increasingly important for agricultural research libraries, as they provide access to grey literature, technical reports, and locally generated content often absent in international databases (Institutional Repository Studies, 2024). Digital agriculture resource libraries are also emerging to provide sector-specific collections, tailored to the needs of researchers and practitioners.

Impact on User Satisfaction

Evidence suggests that the adoption of digital tools positively influences user satisfaction when effectively implemented. Ezeala (2011) found that agricultural researchers in Nigeria reported higher satisfaction with electronic resources compared to outdated print collections. Similarly, Institutional Repository Studies (2024) highlight that when repositories are user-friendly and well-maintained, they significantly improve perceptions of accessibility and convenience.

Nonetheless, user satisfaction is not uniformly high. Yahaya (2019) observed that despite the introduction of digital services, some users expressed dissatisfaction due to poor awareness, inadequate training, and system downtime. This implies that user satisfaction is conditional, depending not only on the presence of digital tools but also on their usability, reliability, and the level of support offered to users.

Key Enablers of Effective Use

The literature identifies several factors that enable digital tools to translate into improved user satisfaction:

1. **Infrastructure and Connectivity** – Stable electricity and reliable internet are prerequisites for digital service delivery. Frequent outages reduce the perceived reliability of library systems (IITA Library, 2023).
2. **Capacity Building** – Librarians' technical expertise and users' digital literacy are critical for adoption. Training sessions improve confidence and utilization of electronic resources (Adeleke, 2022).
3. **Relevant Content** – Satisfaction increases when digital libraries include locally relevant agricultural research outputs, datasets, and extension materials (Oluwaseun, 2025).
4. **Trustworthy Management** – Users are more likely to rely on institutional repositories when metadata is consistent, preservation strategies are in place, and content is reliable (Institutional Repository Studies, 2024).

Challenges

Despite progress, Nigerian agricultural and research libraries face persistent challenges. Underfunding limits subscriptions to databases and hinders system upgrades (Ezeala, 2011). Inadequate training and weak digital literacy among users often result in low utilization of available resources (Adeleke, 2022). Fragmentation of library systems and lack of interoperability between platforms also reduce efficiency and frustrate users (Yahaya, 2019). Furthermore, frequent electricity shortages and poor connectivity remain major obstacles (IITA Library, 2023).

Emerging Trends and Innovations

Several emerging trends promise to reshape user satisfaction in agricultural and research libraries:

- **Institutional Repositories and Visibility:** Repositories are increasingly used to host theses, dissertations, and agricultural reports, improving institutional visibility and accessibility of local research (Institutional Repository Studies, 2024; Yahaya, 2022).
- **Artificial Intelligence (AI):** AI-driven cataloguing and recommendation systems are being piloted in some Nigerian libraries. These tools promise to simplify search processes, though cost and technical barriers remain (Recent Perspectives on AI in Libraries, 2025).
- **Sectoral Digital Resource Platforms:** Initiatives such as the Digital Agriculture Resources Library illustrate how libraries can expand their role beyond academia into agricultural extension and capacity building (Oluwaseun, 2025).

Synthesis and Research Gaps

The literature generally supports the argument that digital tools enhance user satisfaction in Nigerian agricultural and research libraries. However, the degree of satisfaction depends on infrastructure reliability, staff and user competence, and the relevance of resources provided. Key gaps remain: few longitudinal studies track changes in satisfaction before and after digital interventions, usability assessments of Nigerian institutional repositories are limited, and little empirical evidence exists on AI-driven library services in the Nigerian agricultural context. Addressing these gaps would provide more robust evidence on how digital tools shape user satisfaction.

Methodology

This study employed a **quantitative survey design** to investigate the use of digital tools and their effect on user satisfaction in agricultural and research institute libraries in Nigeria. The population comprised library staff and users, including researchers, students, and extension workers. A **multistage sampling technique** was used, with institutes purposively selected and respondents chosen through stratified random sampling. Data were gathered using a **structured questionnaire** covering demographics, digital tools, satisfaction levels (5-point

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Likert scale), and challenges. The instrument's validity was ensured through expert review, and reliability tested using **Cronbach's alpha**. Questionnaires were distributed both in print and online. Data were analyzed with **SPSS**, employing descriptive statistics for summaries and inferential statistics (Chi-square and correlation) to examine relationships at $p < 0.05$. Ethical approval was obtained, and respondents participated voluntarily with confidentiality guaranteed.

Result Presentation

Table 1: Demographic Profile of Respondents

Category	Frequency (n=250)	Percentage (%)
Gender (Male)	140	56.0
Gender (Female)	110	44.0
Age (18–29)	70	28.0
Age (30–39)	95	38.0
Age (40 and above)	85	34.0
User Type (Researchers)	90	36.0
User Type (Students)	100	40.0
User Type (Extension Workers)	35	14.0
User Type (Librarians)	25	10.0

Table 1 presents the demographic characteristics of respondents. Out of 250 participants, 56% were male and 44% female. The majority (38%) were between the ages of 30 and 39, followed by those aged 40 years and above (34%). In terms of user categories, students represented the largest group (40%), followed by researchers (36%), while librarians accounted for the smallest proportion (10%). These findings suggest that the study captured perspectives across different user groups, with students and researchers forming the primary users of digital tools in agricultural and research institute libraries.

Table 2: Availability and Use of Digital Tools

Digital Tool	Available (%)	Frequently Used (%)	Mean Satisfaction (1–5)
E-journals & Databases	80	70	4.2
Online Public Access Catalog	65	50	3.8
Institutional Repositories	55	40	3.5
Mobile Applications	30	20	3.2
Automated Cataloguing Systems	45	35	3.6

As shown in Table 2, e-journals and databases were the most widely available (80%) and frequently used (70%) digital resources, with a mean satisfaction score of 4.2 on a 5-point scale. OPACs (65%) and institutional repositories (55%) were also available, though their usage rates were lower. Mobile applications, however, recorded the least availability (30%) and usage (20%). These results highlight the central role of e-resources in meeting the information needs of agricultural researchers and students, while also pointing to underutilization of repositories and mobile tools.
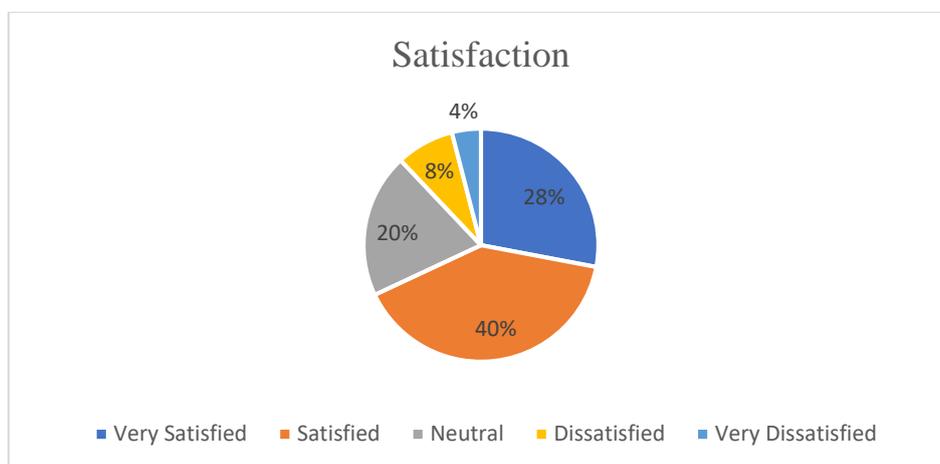
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User satisfaction

Figure 1 illustrates the overall satisfaction levels of respondents with digital tools. About 68% of users reported being either satisfied or very satisfied, while only 12% expressed dissatisfaction. A further 20% remained neutral. This distribution indicates that although the majority of users are content with available services, there remains a significant proportion who feel indifferent or dissatisfied, suggesting areas for improvement.

Table 3: Challenges Faced in Using Digital Tools

Challenge	Frequency (n=250)	Percentage (%)
Poor internet connectivity	160	64.0
Inadequate funding	120	48.0
Unstable electricity	140	56.0
Lack of user training	95	38.0
Low awareness of available tools	75	30.0

Table 3 outlines the challenges faced by users. Poor internet connectivity (64%) and unstable electricity supply (56%) were the most frequently reported barriers, followed by inadequate funding (48%). Other challenges included lack of training (38%) and low awareness of available digital tools (30%). These findings align with previous studies emphasizing infrastructural and funding limitations as major constraints to digital library effectiveness in Nigeria.

Table 4: Correlation between Digital Tool Use and User Satisfaction

Variable Pair	Correlation Coefficient (r)	p-value	Decision
Use of e-journals & Satisfaction	0.62	0.001	Significant
Use of OPAC & Satisfaction	0.41	0.012	Significant
Use of Repositories & Satisfaction	0.35	0.045	Significant
Use of Mobile Apps & Satisfaction	0.21	0.092	Not Significant

Table 4 shows the correlation analysis between digital tool usage and satisfaction. A strong positive relationship was found between the use of e-journals and satisfaction (r = 0.62, p = 0.001), while OPAC (r = 0.41, p = 0.012) and repositories (r = 0.35, p = 0.045) also showed significant positive correlations. However, mobile applications exhibited only a weak and non-significant relationship with satisfaction (r = 0.21, p = 0.092). These findings suggest that the more users engage with established digital resources such as e-journals and OPACs, the higher their satisfaction levels, while newer tools such as mobile apps are yet to demonstrate similar impact.

Discussion of Findings

The findings of this study highlight the increasing reliance on digital tools in agricultural and research institute libraries in Nigeria, while also revealing persistent challenges that limit their full potential. First, the demographic distribution showed that students and researchers were the primary users of digital tools. This finding is consistent with earlier studies that identified students and academic staff as the most active users of electronic resources in research libraries (Ojo & Akande, 2020; Yusuf & Adeoti, 2021). Their dependence on digital tools underscores the critical role of libraries in supporting learning, research, and innovation in the agricultural sector.

Second, the study revealed that e-journals and databases were the most available and frequently used tools, and they recorded the highest satisfaction scores. This aligns with the work of Ani and Edem (2019), who found that electronic journals significantly enhanced research productivity in Nigerian universities. The relatively lower use of institutional repositories and mobile applications suggests under exploitation of tools that could provide broader access to indigenous research outputs and facilitate learning on-the-go (Adeleke & Akinniyi, 2020). Thus, while progress has been made in the adoption of core digital resources, diversification of digital services remains limited.

Third, user satisfaction levels indicated that while most respondents were satisfied with digital tools, a notable proportion expressed neutrality or dissatisfaction. This finding echoes Adebayo and Oyewumi (2018), who noted that satisfaction with digital services in Nigerian libraries is often undermined by inconsistent infrastructure and service delivery. This suggests that beyond availability, the quality and reliability of access remain critical determinants of user satisfaction.

Challenges identified such as poor internet connectivity, unstable electricity, and inadequate funding were consistent with those reported in prior studies on Nigerian library environments (Echezona et al., 2017; Ugwu & Onyebuchi, 2019). These challenges continue to limit the ability of libraries to fully harness digital technologies. The fact that lack of training and low awareness also emerged as barriers indicates that both infrastructural and human capacity issues must be addressed to ensure effective utilization.

Finally, the correlation analysis demonstrated that frequent use of e-journals, OPAC, and repositories significantly influenced user satisfaction, whereas mobile applications did not. This finding suggests that traditional digital services remain central to user experience, while newer technologies such as mobile apps are yet to make significant impact. This may be due to limited development, poor promotion, or lack of user skills in leveraging these platforms

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(Ibrahim & Salisu, 2020). Consequently, libraries must not only maintain and strengthen established digital services but also invest in training and sensitization to improve adoption of emerging tools.

In summary, the results affirm that digital tools are crucial for enhancing user satisfaction in Nigerian agricultural and research libraries, but infrastructural deficits, funding constraints, and inadequate training remain major barriers. Addressing these challenges will be essential to maximize the potential of digital tools in supporting agricultural research, innovation, and knowledge dissemination.

Conclusion

Digital tools are essential for improving user satisfaction in agricultural research libraries in Nigeria. While resources such as e-journals and OPACs are widely used and valued, infrastructural challenges and inadequate training limit optimal utilization. Strengthening infrastructure, funding, and human capacity is critical to ensuring that libraries fully leverage digital technologies to support agricultural research and innovation.

Recommendations

1. Infrastructure development: Invest in stable internet, ICT facilities, and alternative power sources.
2. Increased funding: Ensure sustainable budgets for acquiring and maintaining digital resources.
3. Staff training: Provide continuous digital literacy and ICT skills training for librarians.
4. User education: Raise awareness and conduct training to encourage the use of underutilized digital tools.
5. Policy and collaboration: Foster resource-sharing and partnerships among agricultural and research libraries.

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