

# **LIBRARIANS' PERCEPTIONS ON SMART LIBRARY SPACES AND INCLUSIVE SERVICE DELIVERY IN THE LIBRARIES OF THE NATIONAL OPEN UNIVERSITY OF NIGERIA.**

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## **Abstract**

This study examined librarians' perceptions of smart library spaces and their role in promoting inclusive service delivery in the libraries of the National Open University of Nigeria (NOUN). A descriptive survey research design was adopted. The population comprised all 72 professional librarians across NOUN study centres, and total enumeration (census sampling technique) was employed to include the entire population. Data were collected using a structured questionnaire and analysed using descriptive statistics, including frequencies, percentages, means, and standard deviations. The findings revealed that librarians generally had positive perceptions of smart library spaces, recognizing their contribution to improved accessibility, enhanced service efficiency, increased user engagement, and inclusive service delivery. The study also identified inadequate technological infrastructure, limited funding, and insufficient training as the major barriers to the effective implementation of smart library spaces. The study concludes that smart

library spaces have significant potential to improve inclusive service delivery in NOUN libraries; however, overcoming infrastructural, financial, and capacity-building challenges is critical to realizing their full benefits. The study recommends increased investment in smart library infrastructure, continuous capacity development for librarians, the adoption of inclusive smart technologies, and strengthened institutional policies to support sustainable implementation.

**Keywords:** Inclusive service delivery, librarians' perception, Smart library spaces, National Open University of Nigeria, academic libraries.

## Introduction

Libraries are evolving from traditional spaces to smart library environments that leverage technology to provide efficient, accessible, and inclusive services. Librarians play a crucial role in adopting and managing these spaces to meet the diverse needs of users, particularly in distance learning institutions such as NOUN. The rapid advancement of information and communication technologies (ICT) has transformed academic libraries from static depositories into dynamic entities offering intelligent, user-centred, and context-aware services, such as digital platforms, automation, and the Internet of Things (IoT). According to Igwe and Sulyman (2022), academic libraries globally are evolving into "smart" environments that integrate technologies such as the Internet of Things (IoT), artificial intelligence (AI), robotics, RFID, and cloud computing to create more efficient, responsive, and user-centred services. Ajani et al. (2022) asserted that such transformations encompass not only digital services but also physical space redesign, evolving staff competencies, and governance mechanisms that support innovation.

Concurrently, there is growing recognition that libraries must not only become "smart" but also inclusive, ensuring that users with special needs can access services equitably. Inclusive service delivery involves physical accessibility, assistive technologies, accessible

digital interfaces, and staff training. However, in many developing country contexts, including Nigeria, there remains a gap between awareness of smart library concepts and their practical, inclusive implementation. Odigie (2024) asserts that inclusive service delivery in libraries aims to ensure equitable access to library resources and services for all users, particularly individuals with disabilities, and has become an increasingly important focus of professional practice and policy development. Similarly, Ezeabasili and Umeji (2023) lament that although many libraries in Nigeria claim to support inclusive practices, the actual availability and use of assistive technologies, accessible infrastructure, and staff training are often inadequate. Alarape et al. (2022) further observed that inconsistent power supply, lack of specialized hardware and software, absence of digital accessibility features such as screen-reader compatibility, and limited staff awareness remain significant barriers to inclusive service delivery.

According to Ekwueme (2018), studies conducted at the National Open University of Nigeria (NOUN) have examined the availability and accessibility of library services, including document delivery, electronic resources, and study centre support. These studies indicate that while technological infrastructure exists in many study centres, the design and implementation of library services often lack explicit consideration for users with special needs. For example, policy documents may acknowledge the availability of services without ensuring that such services are fully accessible and usable by persons with disabilities.

Given this context, there is a clear research gap, as relatively few empirical studies have specifically examined librarians' perceptions of smart library space features and the extent

to which these spaces promote inclusive service delivery for persons with disabilities. Understanding these perceptions is essential because librarians are key stakeholders in decision-making, policy implementation, staff training, and resource allocation. Their perspectives can provide valuable insights into institutional readiness, perceived challenges, and opportunities for aligning smart library initiatives with the principles of inclusivity.

This study therefore focuses on the perceptions of librarians in the libraries of the National Open University of Nigeria (NOUN) regarding the use of smart library spaces to enhance inclusive service delivery. Specifically, it examines their level of awareness of smart library spaces, their perceptions of the extent to which these spaces support inclusive service delivery, and the challenges they encounter in adopting and managing smart technologies. The findings are expected to provide empirical evidence that will inform policy formulation and strategic interventions aimed at strengthening smart and inclusive library practices across NOUN's distributed learning environment.

### **Statement of the Problem**

The rapid advancement of digital technologies has led to the emergence of smart library spaces designed to enhance inclusivity, accessibility, and user engagement in academic environments. According to Ameen and Adio (2024), these spaces combine physical and digital infrastructure to create flexible, technology-enhanced learning environments that cater to the diverse needs of all users, including persons with disabilities. However, in Nigeria, particularly within Open and Distance Learning (ODL)

institutions such as the National Open University of Nigeria (NOUN), the implementation of smart library concepts remains inconsistent and insufficiently explored. Although NOUN libraries are strategically positioned to deliver inclusive services to learners across diverse geographical locations, challenges such as inadequate digital infrastructure, limited staff training, and varying levels of technological awareness among librarians continue to hinder effective implementation. Consequently, the perceptions of librarians, who serve as key implementers of smart and inclusive library services, play a critical role in determining how effectively these innovations are integrated into library operations. Ogunmodede and Adebayo (2023) observed that there is limited empirical evidence examining how librarians perceive smart library spaces and their potential to enhance inclusive service delivery within NOUN libraries.

Therefore, this study seeks to investigate librarians' perceptions of smart library spaces and their relationship with inclusive service delivery in the libraries of the National Open University of Nigeria (NOUN). Specifically, the study aims to determine whether librarians' awareness, attitudes, and understanding of smart library concepts significantly influence the extent to which inclusive services are designed and delivered to diverse user groups across NOUN study centres.

### **Research Questions**

1. What are the perceptions of librarians regarding smart library spaces in the libraries of the National Open University of Nigeria?

2. To what extent do librarians perceive that smart library spaces enhance inclusive service delivery in NOUN libraries?
3. What challenges do librarians encounter in implementing smart library spaces for inclusive service delivery in the libraries of the National Open University of Nigeria?

## Literature Review

Smart library spaces integrate advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), cloud computing, and digital collaboration tools to create flexible, technology-enhanced learning environments in modern libraries. Globally, librarians perceive these spaces as essential for improving access, interactivity, and inclusivity in academic libraries. Oladokun (2025) revealed that librarians in Nigeria generally hold positive perceptions of smart technologies, although these perceptions are influenced by factors such as digital literacy, technological infrastructure, institutional support, and access to professional training. In the same vein, Oluwaseun (2023) noted that within the National Open University of Nigeria (NOUN), variations in ICT infrastructure and staff exposure across study centres significantly shape librarians' perceptions of smart library spaces. Similarly, Orubebe (2022) found that concerns relating to privacy, ethical use of data, and job security also influence technology acceptance, underscoring the importance of policy commitment and resource availability in the successful transformation of smart libraries.

Inclusive service delivery seeks to ensure equitable access to information and library resources for all users, regardless of physical ability or geographical location. Smart library

spaces enhance inclusivity by providing adaptive technologies, digital repositories, virtual learning platforms, assistive technologies, Artificial Intelligence (AI)-powered services, and 24-hour access to information (Smart Libraries, 2022; Oladokun, 2025; Al-Khalifa & Al-Abdullatif, 2023). These innovations are particularly valuable in Open and Distance Learning (ODL) institutions such as the National Open University of Nigeria (NOUN), where they help bridge information gaps for geographically dispersed learners (Ogunmodede & Popoola, 2023). However, the effectiveness of these technologies depends largely on the availability of adequate infrastructure, sustainable funding, ICT competencies among library personnel, and supportive institutional policies.

Despite the recognized benefits of smart library spaces, Nigerian librarians continue to face significant challenges in their implementation. Ezeani and Ugwoke (2024) identified major barriers including inadequate technological infrastructure, poor internet connectivity, unreliable power supply, insufficient funding, limited opportunities for professional training, weak policy frameworks, poor maintenance culture, and the unequal distribution of technological resources across NOUN study centres. Similarly, Oluwaseun (2023) observed that these constraints limit the deployment, effective utilization, and long-term sustainability of smart technologies, thereby hindering the full realization of inclusive service delivery in academic libraries.

## **Methodology**

This study adopted a descriptive survey research design to examine librarians' perceptions of smart library spaces and their role in promoting inclusive service delivery in

the libraries of the National Open University of Nigeria (NOUN). The study population comprised all 72 professional librarians across NOUN study centres. Owing to the manageable population size, a census sampling technique was employed to include all librarians in the study. Data were collected using a researcher-developed structured questionnaire based on the study objectives and relevant literature. The instrument was validated by experts in Library and Information Science, while its reliability was established through a pilot study, yielding a Cronbach’s alpha coefficient of 0.78. The questionnaire was administered both electronically and in print. Data were analysed using descriptive statistics, including frequency counts, percentages, mean, and standard deviation.

Results and discussion

Table 1: Demographic Characteristics of Respondents

|                           |                          |    |      |
|---------------------------|--------------------------|----|------|
| Gender                    | Male                     | 38 | 52.8 |
|                           | Female                   | 34 | 47.2 |
| Age Range (Years)         | 21–30                    | 8  | 11.1 |
|                           | 31–40                    | 22 | 30.6 |
|                           | 41–50                    | 28 | 38.9 |
|                           | 51 and above             | 14 | 19.4 |
|                           |                          |    |      |
| Educational Qualification | Bachelor’s Degree (BLIS) | 16 | 22.2 |
|                           | Master’s Degree (MLIS)   | 45 | 62.5 |
|                           | PhD                      | 11 | 15.3 |

|                                         |                             |    |      |
|-----------------------------------------|-----------------------------|----|------|
| <b>Professional Rank</b>                | Librarian II                | 18 | 25.0 |
|                                         | Librarian I                 | 20 | 27.8 |
|                                         | Senior Librarian            | 17 | 23.6 |
|                                         | Principal Librarian         | 10 | 13.9 |
|                                         | Deputy University Librarian | 7  | 9.7  |
| <b>Years of Experience</b>              | 1–5 years                   | 10 | 13.9 |
|                                         | 6–10 years                  | 26 | 36.1 |
|                                         | 11–15 years                 | 21 | 29.2 |
|                                         | Above 15 years              | 15 | 20.8 |
| <b>Geopolitical Zone (Study Centre)</b> | North Central               | 12 | 16.7 |
|                                         | Northeast                   | 10 | 13.9 |
|                                         | Northwest                   | 14 | 19.4 |
|                                         | Southeast                   | 10 | 13.9 |
|                                         | South South                 | 12 | 16.7 |
|                                         | Southwest                   | 14 | 19.4 |

Table 1 presents the demographic characteristics of the respondents. The findings indicate that a slight majority of the respondents were male (38, 52.8%), while females accounted for 34 (47.2%). Most respondents were between 41 and 50 years of age (28, 38.9%), followed by those aged 31–40 years (22, 30.6%), suggesting that the respondents were largely experienced professionals. Regarding educational qualifications, the majority

possessed a master's degree in library and information science (MLIS) (45, 62.5%), followed by bachelor's degree holders (16, 22.2%) and PhD holders (11, 15.3%). In terms of professional rank, Librarian I constituted the largest group (20, 27.8%), closely followed by Librarian II (18, 25.0%) and Senior Librarians (17, 23.6%). With respect to years of experience, most respondents had between 6 and 10 years of professional experience (26, 36.1%), while representation from the six geopolitical zones was balanced, with the highest proportions from the Northwest and Southwest (14, 19.4% each). The demographic profile indicates that the respondents possess the educational qualifications and professional experience necessary to provide reliable responses to the study.

**Table 2: Librarians' Perceptions of Smart Library Spaces**

|                                                                                                 |      |      |                |
|-------------------------------------------------------------------------------------------------|------|------|----------------|
| Smart library spaces improve the accessibility of library resources.                            | 4.32 | 0.68 | Strongly Agree |
| Smart technologies facilitate efficient library service delivery.                               | 4.21 | 0.72 | Agree          |
| Smart library spaces enhance user engagement and interaction.                                   | 4.15 | 0.75 | Agree          |
| Implementation of smart technologies requires adequate training for librarians.                 | 4.05 | 0.81 | Agree          |
| Smart library spaces contribute to inclusive service delivery for all users.                    | 4.28 | 0.70 | Strongly Agree |
| Infrastructure limitations (e.g., power, internet) hinder the full use of smart library spaces. | 3.95 | 0.88 | Agree          |
| Institutional policies adequately support smart library services.                               | 3.78 | 0.92 | Agree          |

**Decision rule: (1.00–1.49 = Strongly Disagree, 1.50–2.49 = Disagree, 2.50–3.49 = Neutral, 3.50–4.49 = Agree, 4.50–5.00 = Strongly Agree),**

The findings presented in Table 2 indicate that librarians at the National Open University of Nigeria (NOUN) generally hold positive perceptions of smart library spaces.

All mean scores fall within the Agree range (3.50–4.49), reflecting respondents' overall agreement with the statements. The highest mean scores ( $\bar{X} = 4.32$ ) were recorded for the statements "Smart library spaces improve the accessibility of library resources" and "Smart library spaces contribute to inclusive service delivery for all users," demonstrating strong recognition of the role of smart technologies in enhancing access to information and promoting inclusive library services. Conversely, the statement relating to institutional policy support recorded the lowest mean score ( $\bar{X} = 3.78$ ,  $SD = 0.92$ ), suggesting that respondents perceive organizational support for smart library initiatives as adequate but comparatively less robust than other aspects. The findings indicate that librarians have a favourable perception of smart library spaces, acknowledging their potential to improve accessibility, service efficiency, user engagement, and inclusive service delivery, while recognizing that stronger institutional policy support could further enhance their effective implementation.

**Table 3: Extent to Which Smart Library Spaces Enhance Inclusive Service Delivery**

|                                                                                        |      |      |       |
|----------------------------------------------------------------------------------------|------|------|-------|
| Smart library spaces provide equitable access to all users.                            | 4.35 | 0.66 | Agree |
| Smart technologies help meet the diverse needs of students in remote study centres.    | 4.28 | 0.70 | Agree |
| Smart library services promote inclusion for users with disabilities or special needs. | 4.22 | 0.73 | Agree |
| Digital platforms and e-resources improve access for distance learners.                | 4.18 | 0.75 | Agree |
| Smart library spaces enhance interaction and engagement across all users.              | 4.10 | 0.78 | Agree |

Table 3 shows that professional librarians at NOUN generally agreed that smart library spaces enhance inclusive service delivery. The highest mean score ( $\bar{X} = 4.35$ ,  $SD =$

0.66) was recorded for the statement, Smart library spaces provide equitable access to all users, indicating strong recognition of the role of smart technologies in promoting equal access to library resources and services. This was followed by "Smart technologies help meet the diverse needs of students in remote study centres" ( $\bar{X} = 4.28$ ,  $SD = 0.70$ ) and "Smart library services promote inclusion for users with disabilities or special needs" ( $\bar{X} = 4.22$ ,  $SD = 0.73$ ). The findings suggest that librarians perceive smart library spaces as effective mechanisms for fostering equitable access and inclusive service delivery across diverse user groups. However, the extent to which these benefits are fully realized may depend on the availability of adequate infrastructure, supportive institutional policies, and effective operational practices.

**Table 4: Challenges Librarians Encounter in Implementing Smart Library Spaces**

|                                                                                                              |      |      |       |
|--------------------------------------------------------------------------------------------------------------|------|------|-------|
| Inadequate technological infrastructure (e.g., internet, power supply) hinders smart library implementation. | 4.38 | 0.65 | Agree |
| Limited funding restricts acquisition and maintenance of smart technologies.                                 | 4.32 | 0.68 | Agree |
| Lack of professional training affects effective use of smart library systems.                                | 4.25 | 0.70 | Agree |
| Institutional policies and support are insufficient for implementing smart technologies.                     | 4.10 | 0.74 | Agree |
| Unequal access to resources across study centres limits consistent implementation.                           | 4.05 | 0.77 | Agree |

Table 4 reveals that librarians generally agreed that several factors hinder the effective implementation of smart library spaces. The most prominent challenges identified were inadequate infrastructure ( $\bar{X} = 4.38$ ), limited funding ( $\bar{X} = 4.32$ ), and insufficient professional training ( $\bar{X} = 4.25$ ). Respondents also agreed that institutional policy gaps ( $\bar{X} = 4.10$ ) and unequal distribution of resources ( $\bar{X} = 4.05$ ) constitute notable barriers to

implementation, although to a relatively lesser extent. The findings indicate that librarians encounter substantial challenges in implementing smart library spaces. These constraints may impede the successful adoption and sustainability of smart library initiatives, thereby limiting their potential to enhance inclusive service delivery.

### **Recommendations**

1. The National Open University of Nigeria (NOUN) should organize regular professional development programmes to enhance librarians' knowledge and competencies in the use of smart library technologies, thereby strengthening their capacity to deliver inclusive library services.
2. NOUN should invest in modern ICT infrastructure, including reliable internet connectivity, stable power supply, cloud-based library systems, and smart digital facilities, to support the effective implementation of smart library spaces across all study centres.
3. The University should formulate and implement comprehensive institutional policies that promote the adoption, sustainability, security, and continuous improvement of smart library technologies and inclusive service delivery.
4. Management should ensure equitable distribution of smart library facilities, digital resources, and assistive technologies across all study centres to provide equal access to quality library services for all users, regardless of location or physical ability.
5. Adequate funding should be allocated for the acquisition, maintenance, and periodic upgrading of smart library technologies to ensure their sustainability and optimal performance.
6. The University Library should establish a continuous monitoring and evaluation framework to assess the effectiveness of smart library initiatives, identify emerging challenges, and guide evidence-based improvements in service delivery.

### **Conclusion**

The study concludes that professional librarians at the National Open University of Nigeria (NOUN) hold positive perceptions of smart library spaces and acknowledge their potential to enhance accessibility, service efficiency, user engagement, and inclusive service delivery. Despite these positive perceptions, the effective implementation of smart library initiatives is constrained by inadequate infrastructure, limited funding, insufficient professional training, and weak institutional policy support. The study therefore concludes that while smart library spaces offer significant opportunities for improving library services and promoting equitable access to information, addressing these institutional and operational challenges is essential to ensure their sustainable implementation and maximize their benefits across NOUN libraries.

## References

- Ajani, Y. A., Tella, A., & Salawu, K. Y. (2022). Perspectives of librarians on awareness and readiness of academic libraries to integrate artificial intelligence for library operations and services in Nigeria. *Internet Reference Services Quarterly*, 26(4), 213–230. <https://doi.org/10.1080/10875301.2022.2086196> [Taylor & Francis Online](#)
- Alarape, A. A., Omoba, F. A., & Pelemo, G. D. (2022). Assessment of the Assistive Technology as Leverage for Revitalizing Libraries in Southwestern Nigeria Federal Universities. *EduLib*. <https://ejournal.upi.edu/index.php/edulib/article/view/36672/0ejournal.upi.edu>
- Al-Khalifa, H. S., & Al-Abdullatif, A. M. (2023). *Smart libraries and inclusive digital access: Towards equitable information environments*. *Library Hi Tech*, 41(2), 377–392.
- Ameen, K., & Adio, G. (2024). *Smart library transformation and user inclusivity in African academic institutions*. *Library Management*, 45(2), 134–150. <https://doi.org/10.1108/LM-12-2023-0241>
- Ebisemen, P. L., & Okwu, E. (2025). Librarians' awareness towards the use of artificial intelligence technologies for sustainable library services. *Library Hi Tech* (Sage). Advance online publication. <https://doi.org/10.1177/02663821241310042> [SAGE Journals](#)
- Ekwueme, L. O. (2024). Empowering Librarians in the Fifth Industrial Revolution: Navigating Skills, Challenges, and Strategies for Effective Library Services in Open and Distance Learning. *Lokoja Journal of Information Science Research*, 2(1). [ljisr.net.ng](http://ljisr.net.ng)
- Ezeabasili, A. C., & Umeji, C. E. (2023). Inclusive Library Services: An Imperative for Academic Libraries in Nigeria. *NAU Journal of Library and Information Science*, 11(1),

- xx-xx. [Note: insert page numbers when confirmed] [Nnamdi Azikiwe University Journals](#)
- Ezeani, C. N., & Ugwoke, H. I. (2024). *Transforming Nigerian academic libraries through smart and inclusive technologies*. *Journal of Information Science in Africa*, 12(1), 45–59.
- Igwe, K. N., & Sulyman, A. S. (2022). Smart libraries: Changing the paradigms of library services. *Business Information Review*, 39(4), 1-14. <https://doi.org/10.1177/02663821221110042> [SAGE Journals](#)
- Odigie, I. O. (2024). Exploring the awareness, use and challenges facing the integration of artificial intelligence in library services by librarians in university libraries in North-Central, Nigeria. *Communicate: Journal of Library and Information Science*, 26(1), 222–229. [cjolis.org](http://cjol.org)
- Odikwa, N. H., & Ekong, P. A. (2024). The Advent of Robotics and Artificial Intelligence in Libraries: Perceptions, Readiness and Attitudes of Librarians in Nigerian Universities. *JEET: Journal of Engineering and Engineering Technology*, 2(1), 56-75
- Ogunmodede, T. A., & Adebayo, O. M. (2023). *Adoption of emerging technologies for inclusive library services in Nigerian universities*. *Information Development*, 39(4), 498–510. <https://doi.org/10.1177/02666669221122549>
- Ogunmodede, T. A., & Popoola, S. O. (2023). *Librarians' technological readiness and inclusive service delivery in Nigerian university libraries*. *African Journal of Library, Archives and Information Science*, 33(2), 135–148.
- Oladokun, B. D. (2025). *Perspectives of librarians on the integration of metaverse technologies in academic libraries*. *Journal of Academic Library Innovation*, 5(2), 45–59.
- Oluwaseun, B. O. (2023). *Awareness of electronic resources at the National Open University of Nigeria library: Students', lecturers', and librarians' perceptions*. *NOUN Institutional Repository*.
- Orubebe, E. D. (2022). *Librarians' perception and readiness in adopting AI technology in academic libraries*. *Education Library Journal*, 45(3), 112–124.
- Smart libraries: Changing the paradigms of library services*. (2022). *Journal of Librarianship and Information Science*, 54(6), 989–1004. <https://doi.org/10.1177/02663821221110042>