



The Role of Artificial Intelligence in Academic Libraries: Advancing Research, Teaching, and Societal Development in the Digital Age

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ABSTRACT

The emergence of Artificial Intelligence (AI) has significantly transformed information management, education, and knowledge dissemination across the globe. Academic libraries, as critical support systems for teaching, learning, and research, are increasingly integrating AI-driven technologies to improve service delivery and user experiences. This study examined the role of Artificial Intelligence in academic libraries with particular emphasis on its contributions to research, teaching, and societal development in the digital age. The study adopted a quantitative survey research design and was conducted at the University Library, Ahmadu Bello University, Zaria. A total of 200 questionnaires were administered to library users, drawn from undergraduate students, postgraduate students, academic staff, and librarians selected through stratified random sampling, of which 187 were properly completed and returned, representing a response rate of 93.5%. Data were collected through a structured questionnaire and analysed using frequency counts, percentages, and mean scores. The findings revealed that Artificial Intelligence significantly enhances research productivity, facilitates teaching and learning activities, and improves access to information resources. The study also found that users generally possess positive perceptions regarding AI-driven library services. However, inadequate funding, poor ICT infrastructure, lack of technical expertise, and concerns relating to data privacy and security remain major challenges affecting the successful integration of AI into academic libraries. The study concludes that AI has enormous potential to transform academic libraries and contribute to educational and societal development, and recommends increased investment in technological infrastructure, continuous training for library personnel, and the establishment of policies to guide the ethical deployment of AI technologies.

Keywords: Academic Libraries; Artificial Intelligence; Higher Education; Research Support; Societal Development; Teaching and Learning

1. Introduction

The rapid development of Information and Communication Technologies (ICTs) has fundamentally transformed the ways in which information is created, organized, accessed, evaluated, and disseminated. Within this changing information environment, Artificial Intelligence (AI) has emerged as one of the most influential technologies, with applications extending across education, healthcare, business, governance, research, and library and information services. AI broadly refers to the capacity of computer-based systems to perform tasks associated with human intelligence, including learning, reasoning, problem-solving, decision-making, language processing, and pattern recognition. Its increasing application has created opportunities to improve efficiency, personalize services, process large volumes of information, and support evidence-based decision-making (Dwivedi et al., 2023).

Academic libraries occupy a strategic position within higher education because they provide information resources and services that support teaching, learning, research, and knowledge dissemination. However, the rapid growth of scholarly information and changing expectations of library users have created increasing demand for faster, more responsive, and more personalized information services. AI technologies, including machine learning, natural language processing, intelligent search systems, chatbots, recommendation systems, predictive analytics, and automated cataloguing tools, provide academic libraries with opportunities to respond to these demands. Their application can automate routine operations, improve information discovery and retrieval, provide timely reference assistance, and enhance interaction between users and library services.

The relevance of AI is particularly evident in research support. Researchers increasingly have to navigate extensive and rapidly expanding bodies of scholarly literature, making efficient information discovery and evaluation essential to the research process. AI-enabled systems can support literature searching, information retrieval, citation analysis, reference management, plagiarism detection, research trend identification, and the organization and analysis of large datasets. Generative AI has expanded the range of technological support available to researchers through capabilities such as information summarization, idea generation, synthesis of materials, and academic writing assistance. When appropriately integrated into academic library services, these applications can strengthen the library's research-support function and enable users to navigate complex scholarly information environments more efficiently (Dada, 2024).

AI also offers considerable opportunities for teaching and learning. Academic libraries increasingly operate within digital learning environments where students and academic staff expect immediate and relevant access to information. AI-powered virtual assistants, recommendation systems, adaptive learning applications, and personalized information services can help users identify appropriate learning resources and obtain assistance more efficiently. These technologies may also contribute to the development of digital and information literacy by enabling users to interact with intelligent information systems and critically evaluate technology-mediated information. AI therefore has the potential to complement the educational functions of librarians and academic institutions by extending the accessibility, responsiveness, and personalization of information services.

The contribution of AI-enabled academic libraries also has implications for societal development. Access to reliable information is essential to informed decision-making, innovation, lifelong learning, digital inclusion, and participation in an increasingly knowledge-driven society. Academic libraries can contribute to these broader outcomes by facilitating access to knowledge, supporting information and digital literacy, promoting knowledge sharing, and enabling users to make effective use of information resources. AI can strengthen these functions through intelligent search, personalized recommendations, multilingual information support, automated services, and more efficient management of digital resources. The societal contribution of AI in academic libraries can therefore be understood in terms of its capacity to extend the reach and effectiveness of knowledge services, promote inclusive access to information, support innovation and lifelong learning, and contribute to informed participation in social and economic development.

Despite these opportunities, the integration of AI into academic libraries is accompanied by institutional, infrastructural, professional, and ethical challenges. Effective implementation requires adequate funding, reliable ICT infrastructure, appropriate digital systems, skilled personnel, and institutional readiness. Concerns relating to

data privacy, cybersecurity, algorithmic bias, transparency, academic integrity, and the responsible use of AI-generated information complicate adoption. These challenges are particularly relevant in developing-country contexts where limited financial and technological resources may constrain the acquisition, implementation, and maintenance of advanced AI systems (Igbo et al., 2024). Successful integration therefore requires more than technological investment; it also depends on professional capacity development, institutional support, appropriate governance mechanisms, and clear policies for responsible AI use.

Existing scholarship demonstrates growing interest in AI applications within academic libraries, particularly in relation to information retrieval, service delivery, automation, research support, and technology acceptance. However, much of the available literature examines these issues separately or focuses primarily on operational efficiency and adoption. Relatively limited attention has been given to the combined contribution of AI to research, teaching, and societal development within a single academic library setting. There is also limited institution-specific evidence concerning how different categories of academic library users perceive AI-enabled services and the challenges they encounter in their implementation. This is important because undergraduate students, postgraduate students, academic staff, and librarians may interact with AI-enabled library services for different purposes and may consequently have different experiences and expectations.

Against this background, the present study examines the role of Artificial Intelligence in academic libraries, focusing on its contributions to research and teaching, societal development, users' perceptions of AI-driven library services, and the challenges affecting AI integration. The study is situated at the Kashim Ibrahim Library, Ahmadu Bello University, Zaria, where undergraduate students, postgraduate students, academic staff, and librarians interact with library resources and services. By examining these dimensions within one institutional context, the study seeks to provide empirical evidence that can support informed decisions on AI adoption, service improvement, professional development, and responsible technological integration in academic libraries. The specific objective of the study is to investigate the contribution of Artificial Intelligence to research, teaching, and societal development in academic libraries, and to establish users' perceptions of, and the challenges affecting, AI-driven library services.

The study sought to find answers to the following research questions: (i) How does Artificial Intelligence contribute to research and teaching activities in academic libraries? (ii) What are users' perceptions regarding the effectiveness of AI-driven library services? (iii) How does Artificial Intelligence contribute to societal development through academic library services? (iv) What challenges affect the integration of Artificial Intelligence into academic library services?

2. Literature Review

2.1 Review of Empirical Studies

This study examines the contribution of Artificial Intelligence to academic library services, with particular attention to research and teaching, users' perceptions, societal development, and challenges affecting AI integration at Kashim Ibrahim Library, Ahmadu Bello University, Zaria. This section reviews relevant empirical studies on the application, adoption, users' perceptions, benefits, and challenges of Artificial Intelligence in academic libraries.

Ngulube and Mosha (2024) conducted a study on the safe integration of Artificial Intelligence technologies in academic libraries. The study focused on examining the potential benefits of AI integration and the institutional conditions required for its safe and responsible implementation. The researchers adopted a literature-based approach to examine issues surrounding AI use in academic library environments. The study highlighted that AI can improve information access, service delivery, and the efficiency of library operations. However, it also identified the need for appropriate governance, ethical guidelines, data protection, and responsible implementation. The researchers concluded that successful AI integration requires libraries to balance technological opportunities with ethical and institutional safeguards. The difference between Ngulube and Mosha's study and the present study is that their study focused mainly on the safe and responsible integration of AI, whereas the present study examines AI more broadly in relation to research and teaching, users' perceptions, societal development, and challenges within a specific Nigerian university library.

Similarly, Mallikarjuna (2024) examined the application of Artificial Intelligence in academic library management. The study investigated how AI technologies could support library operations, resource management, service delivery, and research activities. The study reported that AI contributes to operational efficiency, improved resource management, and enhanced research support. The researcher concluded that AI provides academic libraries with opportunities to automate routine activities and improve the effectiveness of library operations. The difference between Mallikarjuna's study and the present study is that the former emphasized AI applications in library management and operational efficiency, whereas the present study focuses on users' perceptions and the contribution of AI to research, teaching, societal development, and library services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

Adigun and Igboechesi (2024) conducted a study on the role of generative Artificial Intelligence in academic libraries. The study examined the application of generative AI in information retrieval, knowledge discovery, and academic productivity. The researchers reported that generative AI can support users in locating information, discovering knowledge, summarizing materials, and improving academic productivity. However, the study also identified concerns relating to information accuracy, academic integrity, privacy, and the ability of users to critically evaluate AI-generated information. The researchers concluded that while generative AI provides considerable opportunities for academic libraries, its use requires appropriate guidance and critical evaluation. The difference between Adigun and Igboechesi's study and the present study is that their study focused specifically on generative AI and knowledge discovery, whereas the present study considers Artificial Intelligence more broadly and examines its contribution to research and teaching, societal development, users' perceptions, and implementation challenges.

Akinola (2023) examined Artificial Intelligence adoption and service delivery in Nigerian academic libraries. The study investigated the application of AI technologies, including machine learning and natural language processing, in improving library services and user satisfaction. The study reported that AI has positive implications for virtual library services, information access, and user satisfaction. The researcher concluded that AI adoption can enhance the effectiveness and responsiveness of academic library services in Nigeria. The difference between Akinola's study and the present study is that Akinola focused primarily on AI adoption and service delivery, whereas the present study examines the broader contribution of AI to research and teaching, societal development, users' perceptions, and the challenges of AI integration in a specific academic library.

Mohamed (2025) conducted a study on the acceptance of Artificial Intelligence technologies among academic library professionals using the Technology Acceptance Model (TAM). The study examined the influence of perceived usefulness and perceived ease of use on the acceptance of AI technologies. The study found that perceived usefulness and perceived ease of use significantly influenced users' acceptance of AI. The researcher concluded that users are more likely to accept AI technologies when they perceive them as useful and easy to use. The similarity between Mohamed's study and the present study is the application of the Technology Acceptance Model to understand users' perceptions of AI. However, the difference is that Mohamed focused on academic library professionals and technology acceptance, whereas the present study adopts a broader perspective by examining AI contributions to research and teaching, societal development, users' perceptions, and challenges affecting integration.

In a related study, Atanda et al. (2025) conducted a study on the adoption of Artificial Intelligence technology in Nigerian academic libraries. The study examined factors affecting AI adoption, particularly infrastructural and organizational conditions. The study identified inadequate ICT infrastructure, insufficient technical expertise, limited funding, and other institutional constraints as important challenges to AI adoption. The researchers concluded that academic libraries require adequate infrastructure, human capacity, financial resources, and institutional support to effectively integrate AI technologies. The difference between Atanda et al.'s study and the present study is that their study concentrated mainly on factors affecting AI adoption, whereas the present study examines both the contributions and users' perceptions of AI as well as the challenges affecting its integration at Kashim Ibrahim Library.

Similarly, Atanda (2025) examined the prospects and challenges associated with Artificial Intelligence adoption in Nigerian academic libraries. The study considered the opportunities presented by AI for improving library services alongside the challenges that may hinder its effective implementation. The findings indicated that AI offers opportunities for improved information services, automation, service efficiency, and user support, but its adoption is constrained by inadequate infrastructure, limited technical expertise, funding challenges, privacy concerns, and institutional readiness. The researcher concluded that academic libraries need appropriate resources, policies, and professional competencies to maximize the benefits of AI. The difference between this study and the present study is that it examined the general prospects and challenges of AI adoption, while the present study specifically investigates its contribution to research and teaching, societal development, users' perceptions, and the challenges experienced within Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

The empirical studies reviewed reveal several important similarities and differences. The studies generally agree that Artificial Intelligence has the potential to improve information retrieval, research support, teaching and learning, service efficiency, and user experience in academic libraries. They also identify inadequate infrastructure, insufficient funding, limited technical expertise, privacy concerns, and institutional readiness as major barriers to effective AI integration. Studies such as Mohamed (2025) provide a theoretical connection to the present research through the Technology Acceptance Model, particularly its emphasis on perceived usefulness and perceived ease of use. However, most of the reviewed studies focused on general AI adoption, service delivery, generative AI, management efficiency, or professional acceptance, with limited attention to the combined contribution of AI to research and teaching and societal development from the users' perspective.

The present study therefore differs from the reviewed studies in its scope, context, and integrated focus. It examines Artificial Intelligence within Kashim Ibrahim Library, Ahmadu Bello University, Zaria, and brings together four dimensions: AI's contribution to research and teaching, users' perceptions of AI-driven library services, its contribution to societal development, and challenges affecting its integration. Guided by the Technology Acceptance Model, the study provides a contextualized understanding of how users perceive the usefulness and ease of use of AI-enabled library services and how these perceptions relate to their acceptance and use. The study therefore addresses the identified gap by moving beyond general discussions of AI adoption to provide empirical evidence on its academic and societal contributions and the practical conditions required for its effective integration in a Nigerian university library.

2.2 Theoretical Review: Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a useful framework for understanding users' acceptance of information technologies. The model proposes that perceived usefulness and perceived ease of use are central determinants of an individual's attitude towards a technology and intention to use it. Perceived usefulness concerns the extent to which a person believes that using a particular technology will improve performance, while perceived ease of use refers to the extent to which the technology is perceived as requiring minimal effort.

TAM is relevant to the present study because users' perceptions constitute an important dimension of AI-enabled academic library services. When students, academic staff, and librarians perceive AI applications as useful for locating information, supporting research, improving learning, or enhancing service quality, they may be more inclined to use and support such technologies. Similarly, systems that are difficult to understand or operate may discourage adoption even when users recognize their potential benefits. TAM therefore provides a theoretical basis for interpreting users' perceptions of AI-driven library services and understanding how perceived usefulness and ease of use may shape acceptance of such services within the academic library environment.

3. Methodology

The study adopted a descriptive survey research design to examine the role of Artificial Intelligence in academic library services, particularly its contributions to research and teaching, societal development, users' perceptions, and the challenges associated with AI integration. The population of the study comprised 8,087 registered users of the Kashim Ibrahim Library, Ahmadu Bello University, Zaria, consisting of undergraduate students, postgraduate students, academic staff, and librarians. A sample size of 200 respondents was selected from the study population using a stratified sampling technique to ensure representation of the major categories of library users. The respondents were drawn from the four user categories, with the allocation of the sample reflecting the composition of the identified user groups in the study population.

Data were collected using a structured questionnaire designed in line with the objectives and research questions of the study. The instrument consisted of sections covering the contributions of Artificial Intelligence to research and teaching, users' perceptions of AI-driven library services, the contribution of AI to societal development, and challenges affecting AI integration. Responses to the substantive items were measured using a five-point Likert scale of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1). The questionnaire was subjected to expert review to establish its face and content validity, while a pilot study involving 20 respondents who were not included in the main study was conducted to determine its reliability. The reliability analysis produced a Cronbach's alpha coefficient of 0.82, indicating satisfactory internal consistency of the instrument. The questionnaires were administered to the selected respondents, and 187 were properly completed and returned, representing a response rate of 93.5%. The data were analysed using descriptive statistics, particularly frequency counts, percentages, means, and grand means, in accordance with the research questions. A criterion mean of 3.00 was adopted for interpreting the five-point Likert-scale responses; therefore, items with a mean score of 3.00 or above were regarded as indicating agreement, while mean scores below 3.00 indicated disagreement.

Ethical approval and institutional permission for the study were obtained prior to data collection, and all respondents were informed of the purpose of the study and their right to decline or withdraw participation at any stage. Informed consent was secured from each respondent before administration of the questionnaire, and confidentiality and anonymity of responses were assured and maintained throughout the study.

4. Results and Discussion

A total of 200 questionnaires were administered to library users, out of which 187 were properly completed and returned, representing a response rate of 93.5%. The analysis therefore covers the responses obtained from the 187 participants. The findings are presented and discussed in accordance with the research questions guiding the study. Since the instrument employed a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1), a criterion mean of 3.00 was used in interpreting the responses. Mean scores of 3.00 and above indicate agreement with the respective statements, whereas mean scores below 3.00 indicate disagreement.

4.1 Contributions of Artificial Intelligence to Research and Teaching Activities

Table 1 presents respondents' assessment of the contribution of Artificial Intelligence to research and teaching activities in academic libraries.

Table 1: Contributions of Artificial Intelligence to Research and Teaching

S/N	Item	Mean	Decision
1	AI improves information retrieval	4.31	Accepted
2	AI enhances literature searching	4.18	Accepted
3	AI improves research productivity	4.25	Accepted
4	AI supports teaching and learning	4.16	Accepted
5	AI provides personalised recommendations	4.14	Accepted
Grand Mean		4.21	Accepted

Source: Field survey, 2024.

The results in Table 1 show that respondents generally agreed that Artificial Intelligence contributes positively to research and teaching activities in academic libraries, as indicated by the grand mean of 4.21. Information retrieval recorded the highest mean score of 4.31, suggesting that respondents particularly recognized AI's capacity to improve the speed and effectiveness of accessing relevant information. This was followed by improved research productivity (4.25), enhanced literature searching (4.18), support for teaching and learning (4.16), and personalised recommendations (4.14). The findings indicate that respondents perceive AI as having value across both scholarly and educational functions of the academic library. Rather than being limited to routine automation, AI is perceived as a tool capable of improving how users discover information, undertake research, access learning resources, and receive information that is relevant to their individual needs. The findings agree with Bashorun et al. (2024), who highlighted AI's potential to improve academic library services and information access. From the Technology Acceptance Model (TAM) perspective, the high mean reflects strong perceived usefulness, suggesting that users increasingly view AI as a functional component of contemporary academic library services.

4.2 Users' Perceptions of AI-Driven Library Services

Table 2 presents respondents' perceptions of the effectiveness of AI-driven library services.

Table 2: Users' Perceptions of AI-Driven Library Services

S/N	Item	Mean	Decision
1	AI services are easy to use	4.11	Accepted
2	AI improves service quality	4.26	Accepted
3	AI provides accurate information	4.22	Accepted
4	AI enhances user satisfaction	4.19	Accepted
5	AI should be expanded in libraries	4.12	Accepted
Grand Mean		4.18	Accepted

Source: Field survey, 2024.

Table 2 indicates that respondents have a positive perception of AI-driven library services, with an overall grand mean of 4.18. The highest mean was recorded for the view that AI improves service quality (4.26), followed by the perception that AI provides accurate information (4.22) and enhances user satisfaction (4.19). Respondents also agreed that AI services are easy to use (4.11) and that their use should be expanded in academic libraries (4.12). The consistently high scores suggest that users do not merely recognize the presence of AI in library services but perceive it as useful in improving the quality and responsiveness of those services. This supports the Technology Acceptance Model (Davis, 1989), as perceived usefulness is reflected in the value attached to service quality, while ease of use is reflected in users' favourable assessment of AI interaction. Thus, useful and easy-to-use AI services

are likely to encourage greater user acceptance.

4.3 Contributions of Artificial Intelligence to Societal Development

The study also examined the contribution of Artificial Intelligence to societal development through academic library services. This dimension was incorporated to reflect the broader role of academic libraries in promoting knowledge access, digital inclusion, informed decision-making, innovation, lifelong learning, and participation in a knowledge-based society.

Table 3: Contributions of Artificial Intelligence to Societal Development

S/N	Item	Mean	Decision
1	AI-enabled library services improve access to information for diverse groups of users	4.24	Accepted
2	AI facilitates wider access to knowledge resources and supports digital inclusion	4.18	Accepted
3	AI supports informed decision-making and knowledge sharing	4.21	Accepted
4	AI promotes innovation and lifelong learning among library users	4.16	Accepted
5	AI enhances the capacity of academic libraries to contribute to societal development	4.23	Accepted
Grand Mean		4.20	Accepted

Source: Field survey, 2024.

Table 3 shows that respondents generally agreed that Artificial Intelligence contributes to societal development through academic library services, as indicated by the grand mean of 4.20. The highest mean score was recorded for the view that AI-enabled library services improve access to information for diverse groups of users (4.24), closely followed by the perception that AI enhances the capacity of academic libraries to contribute to societal development (4.23). Respondents also agreed that AI supports informed decision-making and knowledge sharing (4.21), facilitates wider access to knowledge resources and digital inclusion (4.18), and promotes innovation and lifelong learning (4.16). The results suggest that respondents perceive the contribution of AI in academic libraries as extending beyond immediate research and teaching functions to broader knowledge and developmental outcomes, consistent with the broader literature linking AI-enabled libraries with improved information access, digital inclusion, knowledge sharing, and lifelong learning. Although TAM focuses primarily on individual technology acceptance, its perceived usefulness construct helps explain how useful AI services can promote access to knowledge, learning, and informed decision-making. The finding therefore suggests that AI adoption in academic libraries can contribute to broader societal goals, including knowledge accessibility, innovation, digital inclusion, and lifelong learning.

4.4 Challenges Affecting the Integration of Artificial Intelligence into Academic Libraries

Table 4 presents the challenges identified by respondents as affecting the effective integration of Artificial Intelligence into academic library services.

Table 4: Challenges Affecting AI Integration

S/N	Item	Mean	Decision
1	Inadequate funding	4.36	Accepted
2	Poor ICT infrastructure	4.28	Accepted
3	Lack of technical expertise	4.19	Accepted
4	Privacy and security concerns	4.12	Accepted
5	Resistance to technological change	4.15	Accepted
Grand Mean		4.22	Accepted

Source: Field survey, 2024.

The findings in Table 4 demonstrate that respondents identified substantial challenges affecting the integration of Artificial Intelligence into academic library services, with a grand mean of 4.22. Inadequate funding recorded the highest mean of 4.36, followed by poor ICT infrastructure with a mean of 4.28. Lack of technical expertise recorded a mean of 4.19, while resistance to technological change and privacy and security concerns recorded means of 4.15 and 4.12, respectively. The results indicate that the major constraints are not limited to the availability of AI technologies themselves but include the financial, infrastructural, human, organizational, and ethical conditions required for their effective implementation. This agrees with Igbo et al. (2024), who identified infrastructure, technical expertise, funding, data availability, privacy, and security as key requirements for AI adoption, and Atanda (2025), who reported inadequate funding, expertise, and infrastructure as major barriers. From a TAM perspective, these challenges can reduce perceived usefulness and ease of use by limiting access to reliable and effective AI systems. Effective integration therefore requires adequate funding, infrastructure, professional competencies, and responsible governance.

A point warrants critical acknowledgment. The mean scores recorded across all four tables were uniformly high, ranging narrowly from 4.11 to 4.36 on a five-point scale, with every single item accepted well above the 3.00 criterion mean. While this pattern is consistent with a generally favourable disposition towards AI among respondents, such uniformly positive responses, clustered close to the upper end of the scale, also raise the possibility of acquiescence bias or social desirability bias, whereby respondents may be inclined to agree with statements regardless of their actual views, particularly where the technology in question (AI) carries positive connotations of modernity and progress. A related possibility is a ceiling effect, in which the instrument's five-point scale may not have been sensitive enough to capture more nuanced or critical variation in respondents' assessments. Because all constructs in this study — contributions to research and teaching, user perceptions, societal development, and integration challenges — were measured through self-reported perceptions collected from the same respondents at a single point in time, the findings should be interpreted with appropriate caution. Future research would benefit from triangulating self-reported perceptions with behavioural or usage data (such as system logs of AI-tool use), employing mixed-methods designs that incorporate qualitative interviews, or using reverse-worded items to detect and control for acquiescence bias.

5. Conclusion and Recommendations

The study examined the role of Artificial Intelligence in academic library services, focusing on its contributions to research and teaching, societal development, users' perceptions, and the challenges affecting its integration. The findings indicate that Artificial Intelligence is perceived as an important technological resource for strengthening contemporary academic library services. Respondents generally agreed that AI improves information retrieval, literature searching, research productivity, teaching and learning support, and the provision of personalized information services. The findings show that users have a positive perception of AI-driven library services, particularly with respect to service quality, information accessibility, accuracy, user satisfaction, and ease of use. These results suggest that AI has the potential to complement existing library services and respond to the changing information needs of students, researchers, academic staff, and librarians. The study also established that AI has potential contributions beyond the immediate academic functions of the library, including improved access to information, digital inclusion, knowledge sharing, informed decision-making, innovation, and lifelong learning, reinforcing the broader role of academic libraries as knowledge institutions whose services can contribute to educational, technological, and social development. Nevertheless, these benefits cannot be separated from the conditions under which the technology is implemented: the study identified inadequate funding, poor ICT infrastructure, lack of technical expertise, resistance to technological change, and privacy and security concerns as important challenges affecting effective AI integration. Overall, the findings demonstrate that the successful integration of Artificial Intelligence into academic library services requires a balanced approach that combines technological investment with human capacity, institutional preparedness, ethical governance, and user-centred service development; AI should therefore be viewed not as a replacement for librarians or conventional library services but as a complementary technology capable of extending the efficiency, accessibility, responsiveness, and developmental contribution of academic libraries.

Based on these findings, five recommendations are made. First, because inadequate funding and poor ICT infrastructure recorded the highest challenge means (4.36 and 4.28 respectively), academic library management should prioritize investment in reliable ICT infrastructure, internet connectivity, appropriate hardware, and sustainable technological systems, with adequate funding made available for the acquisition, maintenance, upgrading, and evaluation of AI technologies. Second, because lack of technical expertise was also identified as a significant barrier (mean = 4.19), there is a need for continuous professional development for librarians and other library personnel, with training programmes focused not only on the technical operation of AI tools but also on AI literacy, critical evaluation of AI-generated information, data protection, cybersecurity, academic integrity, and ethical use. Third, given that respondents expressed concerns relating to privacy and security (mean = 4.12), academic libraries should develop clear policies and guidelines governing the responsible use of Artificial Intelligence, addressing privacy, data security, academic integrity, transparency, intellectual property, algorithmic bias, and the verification of AI-generated information. Fourth, because respondents perceived AI as contributing to societal development, including digital inclusion and lifelong learning (Table 3), the library should expand AI-enabled services in ways that promote inclusive access to information, designed with the diverse needs of undergraduate students, postgraduate students, academic staff, librarians, and other users in mind, with particular attention to reducing digital barriers. Finally, given the positive user perceptions recorded alongside the identified implementation challenges, university management and library administrators should establish mechanisms for periodically evaluating AI-enabled services based on user feedback, service effectiveness, ethical compliance, and developmental outcomes, so that continued investment in Artificial Intelligence is guided by evidence rather than technological enthusiasm alone.

6. Limitations and Direction for Future Research

This study is subject to several limitations that should be considered when interpreting its findings. First, the study adopted a cross-sectional design, capturing respondents' perceptions of AI-driven library services at a single point in time; this limits the ability to draw conclusions about how these perceptions may change as AI technologies mature or as familiarity with them increases, and future research could adopt a longitudinal design to track such changes over time. Second, the study was restricted to a single academic library, the Kashim Ibrahim Library, Ahmadu Bello University, Zaria, which may limit the generalisability of the findings to other academic libraries with different institutional contexts, resource levels, and user populations; future studies could adopt a comparative, multi-institutional design across Nigerian or other African university libraries. Third, the study relied entirely on self-reported data collected from library users, which is subject to social desirability and acquiescence bias, as reflected in the uniformly high mean scores recorded across all four result tables; because all constructs were measured through the same self-report instrument administered to the same respondents, the findings are also subject to common method bias. Future research could address this by triangulating survey data with behavioural or system-usage data, employing mixed-methods approaches that incorporate qualitative interviews or focus group discussions, or using reverse-worded and validated scale items to reduce response-pattern bias. Finally, future research could extend this study by examining specific categories of AI tools (such as generative AI, chatbots, or recommendation systems) individually, and by exploring the moderating role of user characteristics, such as digital literacy and discipline, on the acceptance and use of AI-driven library services.

References

- Adigun, O., & Igboechesi, C. (2024). Exploring the role of generative artificial intelligence in enhancing information retrieval and knowledge discovery in academic libraries. *International Journal of Library and Information Science Studies*, 10(2), 1–15.
- Akinola, S. A. (2023). Capabilities and apparent implications of artificial intelligence (AI) adoption in Nigerian academic libraries. *University Library at a New Stage of Social Communications Development*, 8, 283–289. https://doi.org/10.15802/unilib/2023_293813
- Atanda, L. (2025). Prospects and challenges of AI adoption in Nigerian academic libraries. *Ethiopian Journal of Education Studies*, 4(2). <https://doi.org/10.20372/xqht4g12>
- Atanda, M. A., Akanbi, M. L., Bello, G. O., & Raji, B. (2025). Adoption of artificial intelligence technology in academic libraries in Nigeria: An analysis of need and hindrances. *IJO — International Journal of Social Science and Humanities Research*, 8(8), 1–15. <https://www.ijojournals.com/index.php/ssh/article/view/1116>
- Bashorun, M. T., Tella, A., Ajani, Y. A., & Adisa, R. M. (2024). Innovating academic library services through the adoption of artificial intelligence technologies in tertiary institutions: The Nigeria experience. *UMYU Journal of Library and Information Sciences*, 1(2), 58–71.
- Dada, O. K. (2024). AI adoption in academic libraries: Practices, challenges, and research opportunities. *Informatio: Journal of Library and Information Science*. <https://jurnal.unpad.ac.id/informatio/article/view/70037>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., & Ahuja, M. (2023). So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI. *International Journal of Information Management*, 71, Article 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Igbo, H. U., Imo, N. T., Jidere, U. J., & Ugwu, F. N. (2024). Adopting artificial intelligence in academic library services in Nigeria: Requirements and challenges. *Nigerbiblios: Journal of the National Library of Nigeria*, 34(1), 1–18.
- Mallikarjuna, C. (2024). Integrating artificial intelligence in academic libraries: An analysis. *DESIDOC Journal of Library and Information Technology*, 44(2), 124–129. <https://doi.org/10.14429/djlit.44.2.18958>
- Mohamed, S. A. (2025). Technology acceptance and artificial intelligence adoption among academic library professionals. *Cyrenaica Journal of Science*, 4(1), 55–70.
- Ngulube, P., & Mosha, N. F. (2024). Integrating artificial intelligence-based technologies 'safely' in academic libraries: An overview through a scoping review. *The Serials Librarian*, 87(1–4), 241–258.