Adoption of Artificial Intelligence in Academic Libraries in African Universities: A Scoping Review

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Abstract

Purpose

The adoption of Artificial Intelligence (AI) in academic libraries is transforming information management globally. However, its implementation across African universities remains poorly understood. This scoping review explores empirical literature on AI adoption within academic libraries in Africa, with the aim of identifying publication trends, current practices, and the systemic and behavioral barriers that influence adoption.

Design/methodology/approach

Guided by the PRISMA-ScR framework, literature was systematically sourced from databases including Scopus, ERIC, Google Scholar, ProQuest Dissertations & Theses Global, and African Journals Online (AJOL). A total of 62 empirical studies published between 2005 and 2024 were reviewed, with 73% appearing between 2022 and 2024 highlighting a recent surge in interest.

Findings

Findings reveal that while awareness of AI's potential is growing, actual implementation remains limited. Most institutions are still in exploratory phases, with few practical applications such as chatbots, machine learning-based recommendation systems, and automated cataloging services in place mainly in South Africa, Nigeria, and Kenya. Financial constraints, inadequate infrastructure, digital literacy gaps, cultural resistance, and the absence of clear policies and ethical frameworks were identified as critical barriers. Conversely, emerging opportunities include strategic planning, AI literacy initiatives, open-source technologies, and international partnerships.

Originality/value

This review provides a foundational understanding of the AI adoption landscape in African academic libraries. It underscores the need for context-sensitive strategies that address structural challenges while leveraging localized innovation. The findings offer valuable insights for policymakers, library professionals, and researchers seeking to guide sustainable and inclusive AI integration across the continent's higher education libraries.

Keywords: Artificial Intelligence, AI Adoption, Academic Libraries, Digital transformation, Library , scoping review.

1. Introduction

Artificial Intelligence (AI) is rapidly transforming industries worldwide, with apparent consequential effects in the education sector, resulting in academic libraries being significantly impacted. Recognized as a blend of technologies enabling machines to perform tasks that typically require human intelligence such as sensing, comprehension, and action, AI is increasingly being integrated into various aspects of modern life (Li et al., 2018; Mannuru et al., 2023). In the same vein, studies by Jinendran and Kumar (2023) and Mvula (2023) contend that the adoption of AI presents a transformative opportunity for academic libraries to be able to offer enhanced service delivery and greater efficiency in information management.

It must be pointed out that existing literature suggests that the adoption of AI in academic libraries varies significantly across regions, the variations are influenced by a range of social, economic, technological, and other regional factors (Orubebe et al., 2024; Zondi et al., 2024). In technologically advanced regions with substantial funding opportunities such as North America and Western Europe, academic libraries have embraced AI technologies across multiple domains. AI-powered applications are increasingly used for search optimization, where algorithms enhance the accuracy and efficiency of library searches by improving keyword recognition, contextual understanding, and ranking relevance (Welker et al., 2020; Ali, 2021). Similarly, virtual reference services, such as AI-driven chatbots, provide 24/7 support by assisting users with inquiries through automated responses on diverse topics, including research guidance (Ali, 2021; Yoon, 2021). These tools significantly enhance user experiences by streamlining interactions and reducing response times.

It is also worth noting that AI is employed for user behavior analysis, enabling libraries to study search patterns, preferences, and engagement metrics (Cox and Rutter, 2019; Zeb et al., 2025). Such data-driven insights help institutions tailor their services, improve resource allocation, and enhance the overall user experience. Library cataloging and classification have also benefited from AI, as machine learning algorithms automate metadata tagging, indexing, and categorization of vast digital and physical collections (Choukimath, 2019; Okunlaya et al., 2022). Additionally, these libraries are utilizing AI-based recommendation systems to optimize their suggestive responses and improve information retrieval efficiency for their users.

In contrast, parts of Southeast Asia and Central Asia have encountered slower AI adoption due to several interrelated factors. One major barrier is the limitation in technical expertise in many institutions to

develop, implement, and maintain AI-driven library systems (Choukimath, 2019; Yoon, 2021). The availability of AI specialists, particularly those with expertise in library science applications, remains scarce, creating a gap in adoption.

Additionally, political instability in some countries has hindered long-term investment in AI technologies (Adel 2024; Socol and Iuga, 2024). Political instability negatively affects governments commitments towards prioritizing the development of policy measures to fund and develop AI-driven library systems to champion digital transformation in academic institutions, focus would rather be directed towards immediate economic and social concerns. Another critical issue is that the uneven development of technological infrastructure affects academic library services in AI by creating disparities in access, implementation, and efficiency, limiting some institutions' ability to integrate AI-driven tools for research support and information management (Yoon, 2021). (Agarwal, 2018; Madan & Ashok, 2023). It is clear that at a global level the uneven state of AI utilization denotes the recognition of varying factors perpetuating its adoption and integration in core services in academic libraries. Similarly, while its benefits are increasingly recognized, concerns about insufficient AI deployment and resource allocation in less developed regions remain.

In Africa, the adoption and use of AI in academic libraries may mirror some of the challenges seen in Asia. Studies by Echedom (2021) and Oyetola (2023) suggest that it is important for African countries to develop capabilities for leveraging AI, as doing this will be crucial for libraries to thrive in the 5th Industrial Revolution (5IR) which is characterised by emphasis of harmonious integration of humans and machines. It is also worth noting that despite the growing global interest in AI, there is still a notable gap in empirical research that specifically focuses on how academic libraries in Africa are adopting AI technologies. Additionally, though some studies exist, much of the research lacks a comprehensive understanding of how AI technologies are shaping user experiences and library operations within the unique socio-economic, technological, and cultural contexts of Africa (Welker et al., 2020; Ali, 2021; Zondi et al., 2024). These sentiments are shared by Agarwal (2018) and Madan and Ashok (2023) contending that while some libraries have successfully adopted AI, the process often requires rethinking of organizational culture, workflows, and workforce capabilities and not just advancements in technological functionalities. To address this gap, a scoping review was conducted to examine the complexities surrounding AI adoption in academic libraries across African universities. The review aimed to identify the current state of AI utilization and specific challenges and opportunities related to AI implementation, as well as investigating the ethical considerations that arise from its use.

2. Objective

To explore AI adoption in African academic libraries, identifying the current use, challenges, opportunities and ethical considerations. The specific questions for this review include:

- What is the current state of artificial intelligence (AI) utilization in Academic Libraries in African Universities?

- What specific AI technologies are being integrated in Academic Libraries in African Universities?
- What are the key barriers to the adoption of AI in Academic Libraries in African Universities?

3. Methods

Following the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews) guidelines, a comprehensive search strategy was employed to identify relevant studies. The search process adhered to the detailed procedures outlined by Pérez and Granger (2007) and Page et al. (2021), ensuring a systematic and transparent approach to data collection. This involved the following:

Inclusion and Exclusion criteria

For a study to be included in this review, it needed to focus on the adoption of AI in academic libraries in Africa. Only English-language papers were considered due to language limitations among the authors. Additionally, key international studies were included if they provided comparative insights applicable to Africa. These studies were selected based on citation impact, methodological rigor (e.g., systematic reviews, empirical research), or direct relevance to AI adoption in African academic libraries. Studies were excluded if they did not specifically focus on AI in academic libraries. Research that examined AI adoption in education without reference to library services or studies on AI in public, national, or special libraries without relevance to academic libraries in Africa was omitted. To maintain credibility, grey literature from non-reputable sources, such as personal blogs and opinion pieces, were excluded.

Source of Information and Search Strategy

To identify relevant studies, a comprehensive search was conducted across multiple electronic databases and grey literature sources from November 2023 to December 2024. The databases searched included Scopus, ERIC, Dimensions, and African Journals Online (AJOL) to ensure broad coverage of peer-reviewed academic literature related to AI adoption in African academic libraries. To capture unpublished and grey literature, additional searches were conducted in Google Scholar, ProQuest Dissertations & Theses Global, and thesis and dissertation databases. The use of academic theses and dissertations was necessitated by the fact that these sources are likely to have theoretical underpinnings and a research design in contrast to other categories of documents in the grey literature and are a useful indicator of scholarly growth in an area (Wang et al.,2022).

An initial scoping search in Scopus was performed to identify key terms, synonyms, and index terms relevant to AI adoption in academic libraries. A structured search strategy using Boolean operators and keyword combinations was then applied across all databases, as per details furnished   in Table 1. Since this review included only English-language studies, searches were conducted in English. Additionally, the reference lists of all included studies were screened to identify relevant papers that may have been missed during the database search. This multi-step search approach ensured comprehensive coverage while maintaining transparency, credibility, and alignment with the inclusion and exclusion criteria.

Table 1: Keywords and queries for the search strategy

Primary Terms	Synonyms
Artificial intelligence (AI)	Automated Reasoning, Machine Learning (ML), Humanoid Intelligence, Deep learning, Chabot's, Robotics, Neural Networks, Natural Language Processing (NLP), ChatGPT, Intelligent Robotics, Cybernetics, Computational Intelligence, Cognitive Science, Intelligent Systems, intelligent Agents, Smart Systems, Emerging Technologies.
Adoption	Acceptance, Utilization, Uptake, Implementation, Usage, Integration, Application, Enactment, Incorporation, Embedding, Assumption.
Academic Libraries	Higher Education Libraries, University Libraries, African University Libraries, Research libraries, College Libraries, Scholarly Libraries, Educational Libraries, Campus Libraries, Institutional Libraries, Learning Resource Centers.
Africa	African University Libraries, African Continent.

Screening of Studies

Studies were selected based on predefined eligibility criteria. After retrieval from various databases, all articles were imported into Mendeley for reference management. Duplicate records were identified and removed by one of the reviewers. The remaining articles were then uploaded to the Rayyan platform for screening. A pilot screening of 20 studies was conducted to ensure consistency and shared understanding of the inclusion and exclusion criteria among reviewers. Following the pilot phase, three reviewers independently screened the titles and abstracts of the remaining studies. Discrepancies were resolved through discussion and, where necessary, with the input of a fourth reviewer. Full-text articles that met the inclusion criteria were then retrieved for in-depth review and data extraction.

Data Extraction

A data extraction table was jointly developed by the review team to determine the key variables to extract. The team then charted the data, discussed the results, and continuously refined the data charting form through an iterative process. This approach allowed for flexibility if new, relevant data types emerged during the review, they were incorporated as deemed necessary by the team. The extracted information is summarized in Table 2 below.

Table 2: Data Extraction Table

Data	Data Description
Article Information	Author(s) name, Year of publication, Location of study (Country where the information source was published or the study conducted), Institution name
Types of Information Sources	Peer reviewed journals, grey literature

Aim/Purpose of Study	Main aims and objectives of the study
Design of Study	Quantitative, Qualitative, Triangulation
Research Methods of Study	Methodological approach utilized
Results of Study	Findings related to scoping review question/s
Additional Information	Additional types of data necessary or important to the questions

4. Results

Overview of Included Studies

Out of the initial 3,480 citations identified from searches of electronic databases and grey literature sources, 2560 were selected after an initial title screening using Mendeley, with 920 titles removed as duplicates. However, a more detailed review was done using Rayyan software to determine relevance of titles based on abstracts resulting in exclusion of 2252, with 308 as articles sort for retrieval. However, 42 full texts were unavailable, reducing the number of eligible articles to 165 for assessment based on the inclusion and exclusion criteria. Following an in-depth review and analysis, 62 articles were deemed eligible for inclusion in this scoping review. The summarized article filtering process is shown in Figure 1.
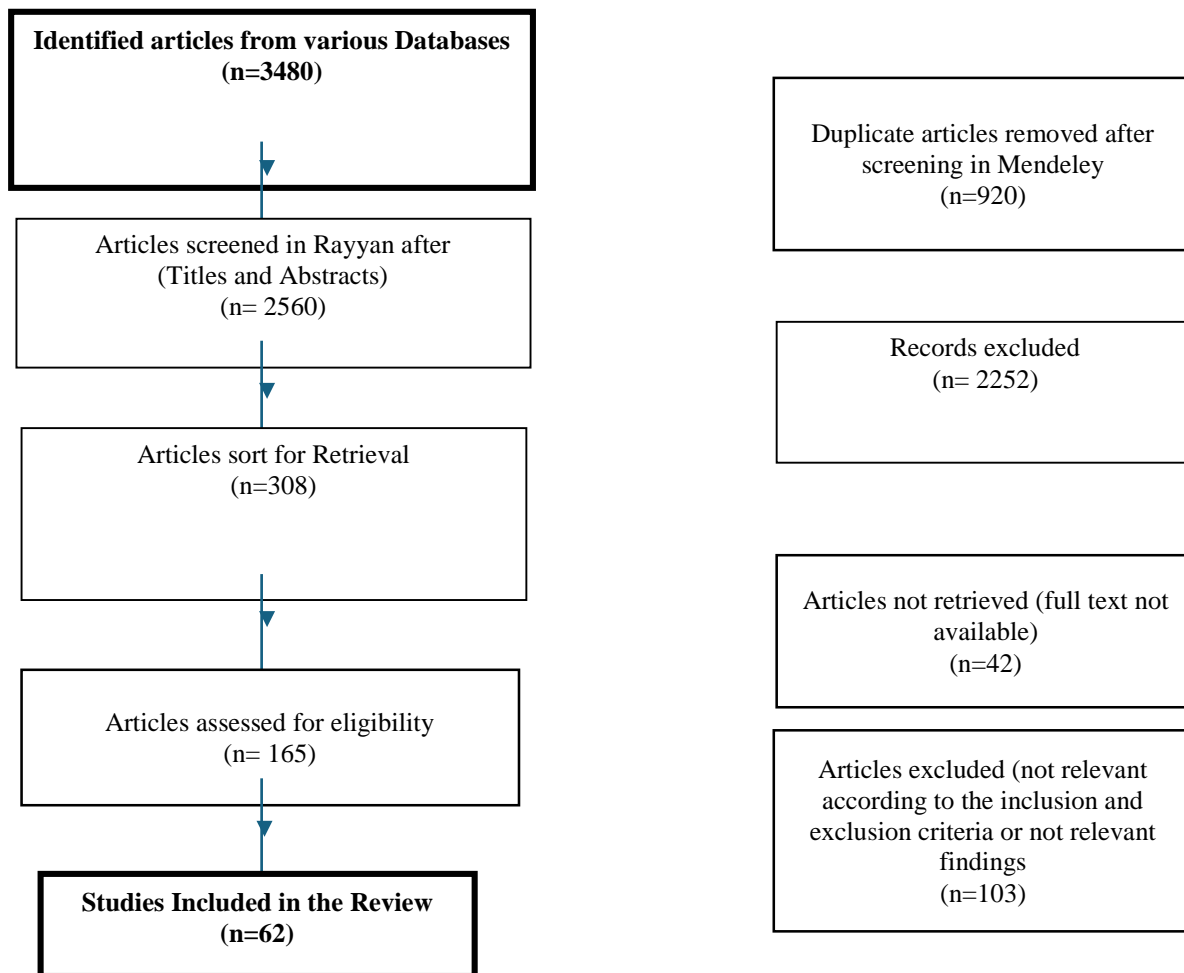
Figure 1: PRISMA ScR flow Diagram.

Publication trend

The review extracted data from scholarly articles published between 2005 and 2024. The main purpose was to establish the trends of publication on AI adoption in academic libraries in African universities. The findings, presented in Figure 2, revealed a significant increase in research on this topic in recent years. Specifically, 73% of the reviewed publications were published between 2022 and 2024, indicating a growing scholarly interest in AI adoption in academic libraries. In contrast, only 6.4% of the reviewed studies were published between 2005 and 2018, with the earliest publication dating back to 2005. Overall, the findings highlight a tremendous surge in publications on this subject since 2022.
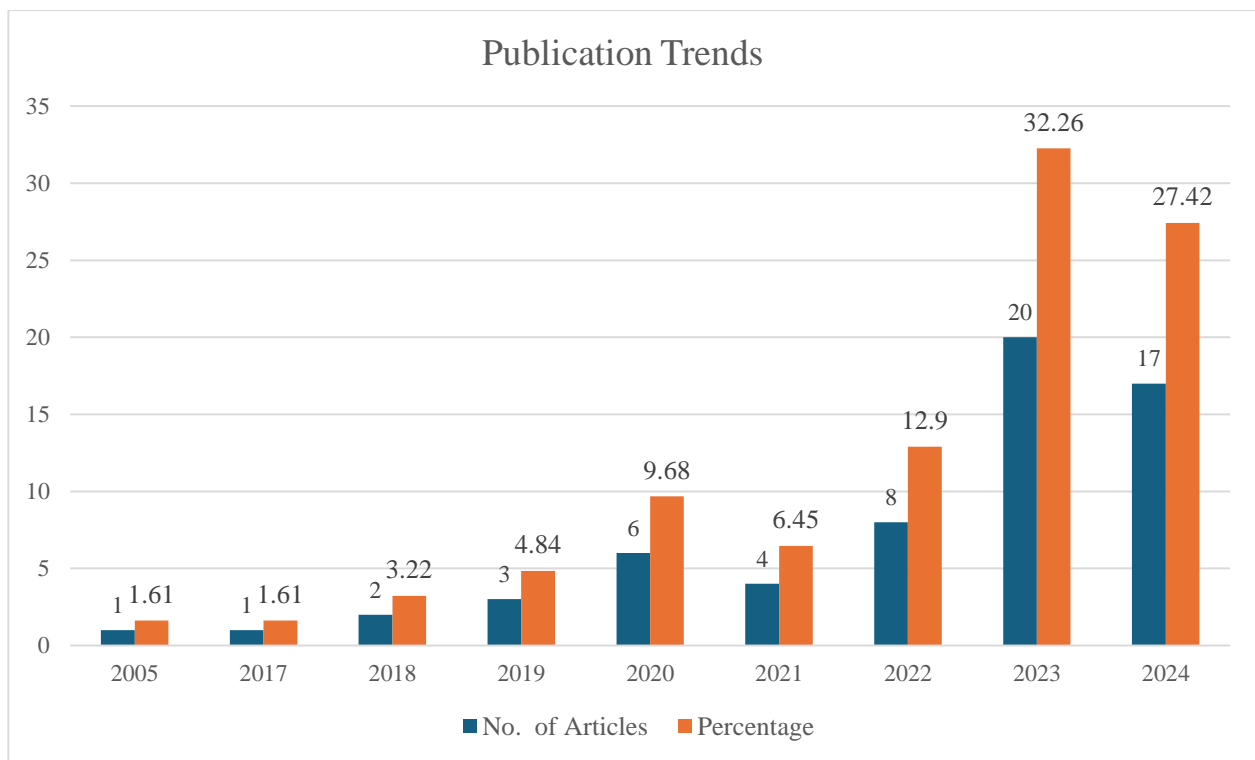
Figure 2: Publication Trends

Research design used

To obtain insights into the research designs used in previous studies which focused on AI adoption in academic libraries in African universities, data on research methodologies were extracted and analyzed. Examining research designs was crucial in understanding the types of studies done in this field. The findings, summarized in Figure 3, provide a comprehensive overview of the types of research used in studies on AI adoption in academic libraries. The results show that various research designs have been employed in the reviewed publications. Specifically, more than a third (22.58%) of reviewed studies utilised a mixed methods design while more than a quarter (19.35%) used systematic review approach respectively. Additionally, the results indicate that an insignificant only a small percent (4.83%) of the reviewed studies relied on desk research designs. This provided a basis for a discussion to determine the adoption of AI in the given African context and make inferences.
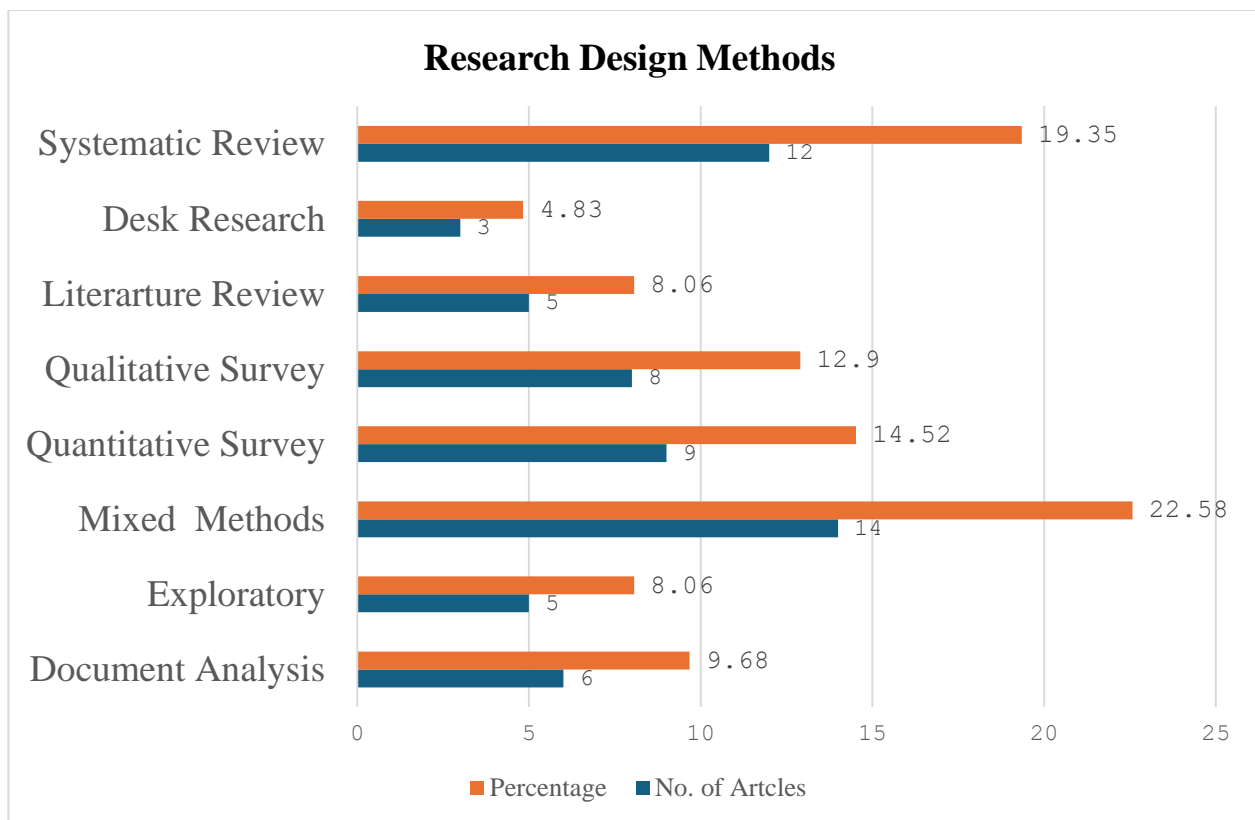
Figure 3: Research Design Methods

5. Discussion of Findings

To ensure clarity and coherence, this paper discussed its findings in relation to its objectives. This structured approach not only summarized the key insights but also provided a detailed exploration of the current state of AI adoption, the specific AI tools implemented, and the barriers to adoption in academic libraries in the African context. Additionally, any patterns or trends observed in the findings were analyzed, along with their possible implications. Where relevant, comparisons with previous research were made to situate the findings within the broader academic and practical landscape.

Current State of AI Adoption in African Libraries

The adoption of AI across African academic libraries remains highly uneven. Literature suggested that although awareness of AI technologies has grown significantly over the past decade, actual implementation at the institutional level continues to lag behind, shaped by divergent infrastructural capacities, institutional priorities, and national digital transformation agendas (David Phillips, 2017; Kyle et al., 2020; Orubebe et al., 2024; Huang et al., 2023). Notably, a closer examination of country-specific data revealed important nuances often overlooked in broader discussions. For instance, a study by Ocholla and Ocholla (2020) in South Africa found that although 64% of academic libraries had adopted digital resources such as e-books and databases, only 4% had formally integrated AI technologies into their service delivery. Crucially, this study evaluated adoption at the service level, assessing institutional deployment of AI-enabled tools such as chatbots, recommendation systems, and automated cataloging services. This represents a more stringent measure of adoption, focused on operational integration.

In contrast, Bakiri et al. (2023), reporting on Tanzanian academic libraries, found that while 68.3% of librarians expressed awareness of AI, 23% reported having adopted AI. However, this figure is based on self-reported individual level use by library professionals, rather than organizational or system-wide implementation. This discrepancy highlights a critical methodological distinction: the Tanzanian data likely reflects informal or exploratory use of AI tools by individual librarians such as generative AI for reference support or AI-powered search tools rather than formal, library-managed deployments. As such, comparisons between countries must account for differing definitions and scopes of what constitutes AI adoption.

Further, despite growing interest, most academic libraries across the continent remain in the exploratory or pilot stages of adoption (Masinde, 2024; Zondi et al., 2024). A few nations namely South Africa, Nigeria, and Kenya have demonstrated comparatively higher levels of integration, attributed to more robust digital infrastructure, better-resourced higher education systems, and the presence of enabling policy frameworks (Orubebe et al., 2024; Kyle et al., 2020). For example, academic libraries in South Africa at Durban University of Technology and University of Pretoria use chatbots, predictive analytics, and automated cataloging, improving service efficiency. Additionally, Zimbabwe is still in adoption stage; librarians remain unprepared, with no comprehensive AI policies raising concerns over data security and plagiarism while in Ghana, recommendations have emerged via focused scoping reviews, though empirical adoption data remain limited

Nevertheless, systemic constraints continue to limit widespread adoption. Recent studies (Huang et al., 2023; Orubebe et al., 2024; Rosenberg, 2005) contend that many academic libraries in developing African nations lack the foundational infrastructure such as reliable internet, modern library management systems (LMS), and cybersecurity measures required for meaningful AI integration. Moreover, legacy systems used by libraries in some institutions are not AI-compatible, creating additional technical and financial barriers to implementation.

Equally significant are institutional and behavioral challenges. Many university libraries operate without clear AI adoption strategies or implementation frameworks. Studies by Harisanty et al. (2023) and Masinde (2024) emphasize the absence of localized, context-sensitive models to guide AI integration in African library environments. This gap has further widened disparities between early adopters and institutions still grappling with basic digital transformation.

In addition, though there is a growing body of literature focusing on AI awareness, fewer empirical studies have examined how to overcome barriers in its adoption through targeted interventions such as capacity building, policy development, and the adaptation of open-source AI tools to low-resource contexts. This lack of implementation-oriented research has limited the ability of institutions to move beyond the awareness phase into strategic deployment.

Overall, AI adoption in African academic libraries remains fragmented and inconsistent. Factors such as institutional readiness, financial investment, digital skills, and policy alignment significantly influence progress. Without a coordinated effort to bridge these gaps through strategic frameworks, partnerships, and scalable pilot programs the potential of AI to transform academic library services across Africa will remain largely unrealized.

AI Technologies Integration in Academic Libraries in African Universities

Several studies have highlighted the integration of AI in academic libraries (Echedom, 2021; Oyetola, 2023). For instance, Ocholla and Ocholla (2020) reported that some African academic libraries have adopted AI-driven robotics to automate routine tasks such as book sorting, shelving, and self-service checkouts, improving operational efficiency. Additionally, libraries are leveraging AI-powered recommendation systems based on machine learning algorithms to enhance information retrieval, personalize user experiences, and provide tailored resource suggestions.

Similarly, Amoah and Minishi-Majanja (2023) examined Ghanaian university libraries' preparedness for the Fourth Industrial Revolution (4IR) and found that while most were not fully ready for AI integration, some had begun implementing AI-driven cybersecurity measures, cloud computing, and Internet of Things (IoT) applications to enhance data security, facilitate remote access to digital resources, and streamline library management systems.

Furthermore, various AI applications such as AI-powered Chatbots and Virtual Assistants, Natural Language Processing (NLP), Data Analytics, and Predictive AI have been integrated into some academic libraries across Africa (Bakiri et al., 2023; Barsha et al., 2023; Sibanda and Ndlovu, 2023; Shahzad et al., 2024a, 2024b, 2024c). However, even with these advancements, full-scale AI adoption remains limited (Kaushal and Yadav, 2022; Mannuru et al., 2023; Oyetola, 2023; Masinde, 2024; Shahzad et al., 2024b).

Barriers to Adoption of AI in Academic Libraries

It must be pointed out that though existing literature has identified numerous challenges hindering AI adoption in African academic libraries, a brief discussion cannot fully address them. However, key challenges that hinder the adoption of AI can be viewed in the deeply interconnected dimensions of infrastructure, financial constraints, culture and psychological factors with each one having a bearing on the other in complex ways. ,

a). Infrastructure Dimension

Studies indicate that most research on AI adoption in African university libraries examines challenges primarily through the lens of technological lag, infrastructure deficits, and resource constraints (Rosenberg, 2005; Owolabi, 2022; Jha, 2023; Abba, 2024; Orubebe et al., 2024). However, a deeper analysis suggests that these barriers stem from broader systemic issues, including institutional preparedness, political will, and socio-economic conditions (David Phillips, 2017; Kyle et al., 2020; Bakiri et al., 2023). This complexity creates a multi-layered barrier, where AI adoption is not merely about acquiring new technology but also about overcoming cultural resistance, financial instability, and inconsistent policy support. Comparatively, Huang et al. (2023) and Orubebe et al. (2024) argue that most library systems in developing countries are not AI-compatible due to low AI readiness, further reinforcing these systemic challenges.

Beyond internal limitations, the digital divide in AI adoption is also shaped by global technological inequities (Huang et al., 2023; Socol and Iuga, 2024; Vercelli, 2024). Western technology companies tend to prioritize high-density, high-income markets where institutions can afford advanced digital tools,

leaving resource-poor African libraries especially those in rural areas without access to the same innovations (African Union Commission, 2023; Barsha and Munshi, 2023 Tomiuk et al., 2024). This lack of investment exacerbates existing disparities, making it difficult for many African academic institutions to keep pace with AI advancements (Barsha and Munshi., 2023; Kipkemboi, M., and Ogwokh, 2022).

Even when AI technologies are introduced, sustainability remains a major issue, as these systems require ongoing technical support, software updates, and reliable Internet connections resources that are often scarce in regions with limited bandwidth and few trained IT professionals (Huang et al., 2023; Socol and Iuga, 2024; Vercelli, 2024)

b). Financial Constraints Dimension

The high upfront costs of AI infrastructure including software, hardware, and specialized training pose a significant barrier to adoption, particularly for academic libraries in developing economies (Socol and Iuga, 2024; Vercelli, 2024). As service-oriented units, academic libraries often receive less funding compared to faculties, which are perceived as more direct contributors to cre business activities at universities (Moustapha and Yusuf, 2023; World Bank, 2023; Sang, 2024). This funding disparity affects the pace and feasibility of digital transformation, making it difficult for libraries to implement ai-driven initiatives while balancing other competing financial needs. Study by Cox et al. (2019) and Wheatley and Hervieux (2019) suggest that academic libraries can explore AI adoption through phased approaches. They also report that libraries could start with cost-effective AI applications, such as automated cataloging systems or AI-powered search engines, and gradually scale up as resources allow, helping to manage financial constraints.

c). Cultural Dimensions

The Theory of Planned Behavior (TPB) has often been used to analyze librarian attitudes, particularly toward adopting new technologies, implementing new services, or making professional decisions (Kyle et al., 2020; Okunlaya and Abdullah, 2023; Omotayo and Idowu, 2023). TPB highlights perceived behavioral control and subjective norms as key determinants of behavior, but these factors are deeply influenced by cultural beliefs about technology and its societal implications especially in African contexts (Phillips, 2017; Okunlaya and Abdullah, 2023; Omotayo and Idowu, 2023). Research indicates that many African societies exhibit mistrust toward AI, fearing that it may erode the human-centered nature of librarianship and undermine indigenous knowledge systems (Phillips, 2017; Subaveerapandiyan and Gozali, 2024). Similarly, academic libraries, traditionally viewed as custodians of local knowledge, are concerned that AI-driven automation might reinforce Western-centric perspectives, sidelining traditional African methods of knowledge organization and preservation (Phillips, 2017; Kyle et al., 2020; Ridley, M., 2022; Abba, T., 2024).

Further, Okunlaya and Abdullah (2023) and Yakubu et al. (2023) emphasize that AI adoption in Africa is not simply a matter of technological progress but a complex, socio-cultural process. They argue that meaningful AI integration must account for the linguistic and epistemological diversity of African knowledge traditions. If external frameworks are imposed without cultural sensitivity, they risk marginalizing indigenous ways of knowledge creation and dissemination. This concern aligns with broader debates on AI bias, where dominant technological paradigms often shaped by Western

epistemologies fail to reflect the realities of diverse knowledge systems. In contrast, Phillips (2017) stresses that to navigate these challenges, stakeholder sensitization, ethical AI design, and transparency must be prioritized. Dispelling myths about AI and framing it as a collaborative tool rather than a replacement for traditional library functions is crucial to fostering ethical and culturally respectful AI adoption (Jha, S.K., 2023; Molaudzi and Marutha, 2024).

d). Psychological Dimension

Beyond cultural concerns, the psychological resistance to AI remains prevalent, particularly regarding job displacement, ethical risks, and data privacy (Kyle et al., 2020; Subaveerapandiyan and Gozali, 2024). In regions where employment opportunities are already scarce, library professionals fear that automation may reduce human involvement, leading to workforce reductions and job insecurity (Omotayo and Idowu, 2023; Gozali, 2024; Orubebe et al., 2024). This anxiety mirrors global debates on AI's impact on labor markets but is particularly pronounced in Africa, where libraries serve not only as information hubs but also as key sources of employment for skilled professionals (Kyle et al., 2020; Huang et al., 2023).

It must be argued that though these concerns are valid, they often overlook AI's potential to improve libraries's efficiency by automating repetitive and time-consuming tasks, such as cataloging, metadata management, and routine queries (Orubebe et al., 2024; Huang et al., 2023). By freeing librarians from mundane tasks, AI enables librarians to focus on higher-order responsibilities, such as digital curation, research support, information literacy training, and user engagement. Thus, rather than replacing librarians, AI can act as an enabler, allowing professionals to deliver more specialized and value-added services in the academic and research ecosystem (Jha, S.K., 2023; Gozali, 2024; Molaudzi, A.I. and Marutha, N., 2024).

Global Comparative Perspective

While lessons from the Global North can be valuable, the socio-economic and infrastructural contexts of India, Brazil, and other regions in the Global South are more closely aligned with Africa's challenges (Gozali, 2024; Orubebe et al., 2024; Zondi et al., 2024). In India, libraries are collaborating with local technology startups to develop AI tools for resource discovery and cataloging (Subaveerapandiyan and Gozali, 2024; Vercelli, A.H., 2024). However, like African libraries, Indian institutions face significant challenges related to cost and technical expertise. Brazil offers a more sustainable approach by integrating AI-powered systems in low-resource settings through partnerships with local organizations and international NGOs (Gozali, 2024; Vercelli, A.H., 2024). This model demonstrates how strategic collaborations can help overcome financial and infrastructural limitations, making it particularly relevant for African libraries.

To facilitate AI adoption, African libraries should prioritize partnerships with local technology startups and non-profits to gain access to affordable, culturally relevant AI solutions. Establishing regional innovation hubs could further enhance knowledge exchange among Global South countries such as India, Brazil, and African nations leading to shared solutions for common challenges in AI implementation (David Phillips, 2017; Kyle et al., 2020; Bakiri et al., 2023).

Study Implications

This scoping review highlights that for AI adoption in African academic libraries to be successful, they must develop strategic, context-sensitive approaches that address infrastructural, financial, and digital literacy challenges. The findings contribute to the growing academic discussion on AI in library science, particularly within the Global South, by emphasizing the need for tailored AI implementation strategies that align with local realities.

From a practical standpoint, the study underscores the necessity of structured AI implementation, capacity-building initiatives, and collaborative partnerships. The proposed phased approach, supported by an AI advisory body and regional roadmaps, provides a framework that policymakers, library administrators, and technology developers can use to guide AI adoption in academic libraries. These insights are valuable for designing AI-driven solutions that empower librarians rather than replace them, ensuring sustainable technology integration.

In terms of policy implications, this study highlights the importance of governmental and institutional support for AI adoption in libraries. The introduction of AI policy incentives, ethical regulatory frameworks, and funding mechanisms such as public-private partnerships and international grants will be crucial in facilitating sustainable AI-driven library services. The study also underscores the need for ethical AI governance to ensure that AI applications in libraries promote inclusivity and mitigate biases in automated systems.

The study also identifies key areas for future research, including the long-term impact of AI-powered services on academic research, digital literacy gaps among librarians and users, and the ethical considerations of AI-driven decision-making in libraries. Further studies should also explore the adaptability of AI tools in diverse African academic contexts, ensuring that AI solutions are both effective and equitable. By outlining these theoretical, practical, and policy implications, this study provides a foundation for continued research and action. The findings serve as a roadmap for stakeholders to ensure that AI integration in African academic libraries is sustainable, inclusive, and beneficial to both librarians and the academic communities they serve.

Conclusion

The adoption of AI in African academic libraries presents a transformative opportunity to enhance service delivery, improve research support, and provide users with more efficient access to information resources. However, this potential comes with complex challenges that go beyond technology adoption. Socio-cultural factors, economic constraints, and political influences significantly shape the ability of libraries to integrate AI successfully. These challenges highlight the need for a context-specific approach to AI adoption, recognizing the diverse realities of African academic libraries.

Further, despite these challenges, studies indicate that some African academic libraries have already begun integrating AI into their operations, automating routine tasks and leveraging machine learning for information retrieval. These libraries can draw valuable insights from both the Global North and Global South, adapting AI strategies to align with their institutional needs and available resources. As the digital

landscape continues to evolve, African academic libraries stand at a pivotal moment where strategic investment in AI can redefine their role in knowledge dissemination and academic research. By fostering a culture of innovation, prioritizing digital literacy, and addressing structural barriers, these libraries can position themselves at the forefront of digital transformation in the information sector. It is clear that the future of AI in African academic libraries is not only about technology adoption, but also about building inclusive, sustainable, and forward-thinking library ecosystems that advance academic excellence and educational equity across the continent.

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