INKUNABULA
Journal of Library Science and Islamic Information
E-ISSN: 2829-9531 | P-ISSN: 2829-9507
Journal homepage: https://jurnal.uindatokarama.ac.id/index.php/inkunabula

Application and Perceived Benefits of AI Literacy: A Phenomenological Study in Academic Librarianship

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KEYWORDS

Artificial Intelligence
Literacy
Academic Librarianship
Phenomenological Analysis

ABSTRACT

This study investigates how artificial intelligence (AI) literacy is applied and perceived by academic librarians in university libraries across Kwara State, Nigeria. Employing a phenomenological approach, fifteen academic librarians were interviewed to explore their lived experiences in utilizing AI-related tools and services. The findings reveal that AI literacy is practiced through various technologies, including virtual assistants, research platforms, chatbots, and discovery engines, which enhance access to scholarly resources and improve library service delivery. However, several challenges hinder effective adoption, such as limited funding, inadequate professional training, ethical concerns, and insufficient Internet infrastructure. The study concludes that although AI literacy provides significant benefits for academic library services, its successful integration requires strategic planning, strong institutional support, and appropriate ethical governance. This research contributes to the literature by situating AI literacy within the lived experiences of academic librarians in a developing-country context, offering new insights into both the opportunities and the constraints of AI adoption in university libraries.

How to Cite this Article: Kayode, A. I., Eromosele , G. O., & Oguntayo , S. A. (2026). Application and Perceived Benefits of AI Literacy: A Phenomenological Study in Academic Librarianship. *Inkunabula: Journal of Library Science and Islamic Information*, 5(1). https://doi.org/10.24239/inkunabula.v5i1.4310

1. Introduction

The fast growth of digital technology has brought major changes to many fields like healthcare (Li et al., 2024), mathematics (Awang et al., 2025), entertainment (Hussain et al., 2024), education (Niloy et al., 2024), politics (Battista & Mangone, 2025), and librarianship (Tella et al., 2025; Eromosele & Kayode 2025; Tella & Ajani, 2022; Kayode et al., 2020). These innovations are now part of everyday life and work. In this tech-driven world, artificial intelligence (AI) is more than just a tool, it is a powerful force changing how people think, work, and interact (McKinsey & Company, 2023). AI, a key part of the Fourth Industrial Revolution, includes smart systems that can perform complex tasks such as understanding language, analyzing data, and providing recommendations (Hodgson et al., 2022; Tella, 2020).

In libraries, AI adoption is growing rapidly (Ayanwale et al., 2024; Suh & Ahn, 2022; Quinn & Coghlan, 2021), shifting focus from traditional literacies to AI literacy (IFLA, 2020; Choice, 2023). AI literacy refers to the ability to use, understand, and critically evaluate AI tools and concepts

https://doi.org/10.24239/inkunabula.v5i1.4310
Received 11 September 2025; Received in revised form 07 January 2026; Accepted 10 January 2026
Available online 29 March 2026

(Ng et al., 2021). It encompasses technical skills, ethical awareness, and practical application. Scholars such as Lo (2023) and Cetindamar et al. (2022) emphasise that AI literacy should not be restricted to technology experts but should be accessible to all. Within academic libraries, AI literacy supports research, teaching, ethical decision-making, access to information, and collaboration (Alam et al., 2024; Lo, 2024).

Existing studies have documented AI tools in libraries, including expert systems, natural language processing, deep learning, and robotics (Tella et al., 2023). Alam et al. (2024) highlighted how robots like Bobbie and Robbie assist with guiding users and scanning thousands of books. These examples demonstrate that AI literacy enhances library services and efficiency. Cox (2022) noted benefits such as improved research, learning, administration, ethics, and cataloguing. Many libraries have integrated AI into their strategic plans with positive outcomes (Ali & Richardson, 2025). Nonetheless, challenges remain, including poor infrastructure, limited funding, and skill gaps.

Even though the benefits of AI literacy appear to outweigh the challenges, concerns persist. Cox (2022) warned about reduced human interaction, potential job displacement, and technological errors. Ali and Richardson (2025) argued that AI cannot replace human judgment and requires human oversight. Without proper guidance, AI integration in libraries may be ineffective.

The broad objective of the study was to examining the application and perceived benefits of artificial intelligence (AI) literacy following the lens of academic librarianship. The specific objectives of the study were to, a) examine the practical applications of AI literacy in academic libraries; b) assess the perceived benefits of AI literacy among academic librarians; and c) identify the challenges associated with AI literacy integration in academic libraries.

Despite the growing global literature on AI literacy in libraries, empirical studies focusing on African academic libraries remain scarce. Much of the existing research originates from Europe, North America, and Asia, with limited attention to the unique infrastructural, cultural, and policy contexts of African institutions. Few studies have systematically explored how academic librarians in Africa perceive, apply, and navigate AI literacy in their daily practice. This gap is significant because African libraries face distinct challenges, such as inadequate funding, poor Internet infrastructure, and limited training opportunities, that shape the adoption and effectiveness of AI tools.

2. Literature Review

2.1. The Concept of AI Literacy in Academic Librarianship

The literature presents multiple definitions of AI literacy, each emphasizing the need for proficiency across diverse domains. Scholars have identified key components such as AI competencies (Carolus et al., 2023; Long & Magerko, 2020), AI-related abilities (Laupichler et al., 2022; Pinski & Benlian, 2023; Deuze & Beckett, 2022), and foundational knowledge and understanding of AI systems (Dai et al., 2020; Hermann, 2021). Collectively, this holistic proficiency enables librarians to engage with AI technologies in an effective, ethical, and autonomous manner. Moreover, AI literacy empowers users to actively apply AI tools in academic libraries and daily life, while also equipping them to critically evaluate AI systems and their outputs (Carolus et al., 2023; Cetindamar et al., 2022; Dai et al., 2020; Hermann, 2021; Kong et al., 2021; Laupichler et al., 2022; Long & Magerko, 2020; Ng et al., 2022). This evolving competency is not only technical but also philosophical, reflecting the growing need for reflective and responsible engagement with emerging technologies in academic librarianship.

In the field of Library and Information Science (LIS), the integration of artificial intelligence (AI) literacy has initiated a transformative shift in how information is structured, retrieved, and disseminated. Echedom and Okuonghae (2021) underscore the influence of AI literacy in reshaping technical services and patron engagement, signalling a significant evolution in the operational dynamics of academic libraries. As AI-driven applications and software become increasingly embedded in library workflows, AI literacy has emerged as a central topic of discourse within the academic library community (Tzanova, 2024). Hovde (2025) notes that the adoption of new technologies in academic libraries alters the information literacy landscape for both librarians and users, necessitating ongoing training and skill development. Consequently,

AI literacy has become indispensable across multiple sectors including information and communications technology, healthcare, higher education, business, marketing, and LIS itself. Without foundational AI literacy skills, librarians may find it challenging to meet the evolving needs of their users effectively. As Gül (2023) affirms, AI literacy equips academic librarians with the ability to identify relevant technologies, communicate effectively with AI systems, understand their limitations, and apply them in practical, service-oriented contexts. This competency is essential for ensuring that librarians remain responsive, ethical, and innovative in an increasingly digital and data-driven environment.

2.2. Applications of AI Literacy in Academic Libraries

Numerous applications have been created and are still being developed to help academic libraries provide effective services in the face of the rapidly expanding amount of information. Among these systems are Google Assistant, Google Translate, chatbots, ResearchRabbit, robots, EndNote, Andisearch, and natural language processing (NLP) technologies. The efficiency of these tools, however, primarily rests on how well they fit into the workflows of library employees, who are in charge of using them to assist users. As Adejo and Misau (2021) conducted a qualitative study on the use of artificial intelligence in Nigerian academic libraries. Their research aimed to explore the potential applications of AI in library services. The findings revealed promising opportunities for AI integration across various functions, including reference services, technical services, indexing, acquisition, NLP, pattern recognition, and robotics. The study recommended two key strategies for Nigerian academic libraries: first, to embrace AI literacy in their operations; and second, to provide staff training in the use of AI tools for service delivery.

Building on this, Adetayo (2023), Kong et al. (2021), Laupichler et al. (2022), Long and Magerko (2020), and Ng et al. (2022) highlight the value of incorporating tools such as Bing Chat, which enables the integration of visual content and fosters a more dynamic conversational interface. This functionality has been shown to enhance personalised learning experiences for users. Nevertheless, the successful use of these AI literacy applications depends on the presence of skilled and adaptable library professionals. Given their central role in implementing AI literacy within academic libraries, it is essential that librarians possess strong patron orientation skills to maximise the benefits of these technologies.

2.3. AI Literacy Benefits among Academic Librarians

It can be argued that the benefits of artificial intelligence (AI) literacy in academic libraries outweigh the associated challenges. This is particularly evident in the substantial time and human resources required to manage the vast volumes of information and data sets handled by academic libraries. Legacy systems such as the Machine-Readable Catalog (MARC), introduced by the Library of Congress over four decades ago, laid the groundwork for the efficient organization and retrieval of large-scale bibliographic data. This historical precedent underscores the potential advantages that AI literacy systems are poised to bring to contemporary library environments. To meet the demands of emerging technologies, the Library of Congress is currently developing advanced online prototypes capable of processing extensive datasets using computer vision and neural networks an innovation that exemplifies the transformative potential of AI literacy in academic librarianship (Castellano & Vessio, 2021).

In today's technological landscape, academic libraries stand to benefit from AI literacy in multiple ways. AI systems can perform complex and labor-intensive tasks that may be difficult or time-consuming for humans, execute operations more rapidly, and reduce the likelihood of errors and defects (Laupichler et al., 2022; Pinski & Benlian, 2023; Deuze & Beckett, 2022). Additionally, AI literacy enables libraries to leverage tools such as GPS, Wi-Fi, and RFID to locate patrons and optimize service delivery. Through image acquisition and trajectory tracking, user behavior can be analyzed to offer personalized services and identify demographic characteristics such as age, nationality, and educational background (Kumar, 2025; Alam et al., 2024).

2.4. Challenges Associated with AI Literacy in Academic Libraries

Artificial intelligence (AI) literacy, while promising increased efficiency across industries, presents notable challenges within academic libraries (Subaveerapandiyan et al., 2023). This study

identifies three key barriers: resistance to change due to job insecurity (Kumar & Sheshadri, 2019; Oladokun et al., 2025; Ogungbenro et al., 2025), inadequate funding for AI tools, and limited technical skills among librarians. Lund et al. (2020), using diffusion of innovation theory, found that many library staff feared AI would negatively affect their job status.

Beyond personal concerns, structural issues such as poor infrastructure and lack of training hinder AI integration (Hussain, 2023; Subaveerapandiyan et al., 2023). Ethical dilemmas, data privacy, and user illiteracy further complicate adoption (Cox, 2022). In low-income regions, unreliable power and limited data facilities exacerbate these challenges. Studies also highlight algorithmic bias, weak regulatory frameworks, and the digital divide (Adewojo et al., 2023; Amini, Vakilimofrad, & Saberi, 2021; Adetayo, 2023; Barsha & Munshi, 2023). The absence of institutional policies on ethical AI use adds to the uncertainty (Ren & Wu, 2025).

To address these issues, collaboration among stakeholders is essential. Clear guidelines, ethical standards, and inclusive training programs are critical for the responsible integration of AI literacy into academic librarianship.

3. Research Methodology

This study adopted a phenomenological research design to explore the lived experiences and perceptions of academic librarians regarding the application of artificial intelligence (AI) literacy in service delivery (Dabengwa et al., 2020; Creswell & Creswell, 2018; Kendrick, 2014). Phenomenology was chosen because it enables a deep understanding of how individuals interpret and engage with a phenomenonin this case, the integration of AI literacy into library workflows. A total of fifteen academic librarians were purposively selected from higher education institutions in Kwara State, Nigeria. This sampling strategy ensured that participants were professionals actively engaged in library operations and familiar with AI literacy applications. All participants had prior experience using AI literacy and generative AI tools, making them well-suited to provide rich insights into the study's objectives. Data were collected using a structured interview protocol designed to elicit detailed responses about participants' experiences with AI literacy, perceived benefits, and challenges encountered. Although the protocol was initially developed for telephone interviews, all sessions were conducted face-to-face to allow for richer interaction and observation of non-verbal cues. Each interview lasted approximately 20-30 minutes and was audio-recorded with participants' consent. The structured format ensured consistency across interviews, while open-ended questions provided flexibility for participants to elaborate on their experiences.

The interviews were analysed using narrative analysis, which allowed the researchers to organize and interpret participants' accounts into coherent themes. The analytical procedure involved several steps: All interviews were transcribed verbatim to preserve participants' voices, researchers read and re-read transcripts to gain an overall sense of the narratives, initial codes were generated to capture recurring ideas, experiences, and perceptions related to AI literacy, codes were grouped into broader themes (e.g., perceived benefits, challenges, ethical concerns, infrastructural barriers and themes were contextualised within the broader literature on AI literacy and librarianship, highlighting both convergences and unique insights from the Nigerian academic library setting. This systematic approach facilitated a deeper understanding of how AI literacy is integrated into academic library workflows and its influence on professional practices.

The study adhered to established ethical standards. Participants were fully informed about the purpose of the research and their rights as subjects. They were assured of confidentiality and anonymity, with all information used solely for academic purposes. Participation was voluntary, and informed consent was obtained prior to the interviews. All fifteen librarians completed the process and provided usable data for analysis.

4. Results and Discussion

4.2. Application of AI Literacy in Academic Libraries

Academic librarians in Kwara State identified several active applications of AI literacy within their institutions, with a strong emphasis on accessibility services for students with disabilities. Tools

such as automated transcription and image recognition were highlighted for enhancing inclusive access. One participant explained:

> *"AI tools like transcription software have made it easier for our visually impaired students to follow lectures in real time."*

Respondents also noted that AI literacy enables personalised learning through recommendation systems and supports staff training in evaluating AI-powered tools such as Google Assistant, Google Translate, ResearchRabbit, chatbots, NLP systems, EndNote, and Andisearch. As one librarian put it:

> *"We now guide faculty on how to ethically use chatbots and research platforms, because students often assume these tools are infallible."*

These findings resonate with Long and Magerko's (2020) AI Literacy Framework, which emphasizes competencies in understanding, using, and critically evaluating AI systems. The librarians' emphasis on accessibility and personalisation reflects the framework's dimensions of

> *"AI as a tool for empowerment" and "AI as a partner in learning."*

Additional feedback emphasised the role of AI literacy in critically assessing vendor platforms, advocating for transparency, and addressing ethical concerns such as data privacy and algorithmic bias. Ten out of fifteen respondents confirmed widespread use of AI tools, reinforcing the global relevance and growing adoption of AI literacy in academic libraries. These findings align with Adetayo (2023), Kong et al. (2021), and Ng et al. (2022), who highlight the value of conversational AI interfaces in enhancing personalized learning.

4.2. Benefits of AI Literacy Among Academic Librarians

Participants consistently emphasised the transformative benefits of AI literacy within academic librarianship. Librarians reported that AI literacy strengthens their role as educators by enabling them to teach students and faculty how to use tools like GPS, Wi-Fi, and RFID, while also fostering critical thinking. One respondent noted:

> *"AI literacy has given me confidence to explain not just how to use RFID, but why it matters for data ethics and privacy."*

These findings align with Kumar (2025) and Alam et al. (2024), who highlight improved access to discovery platforms and citation managers. The librarians' accounts also reflect Ng et al.'s (2021) model of AI literacy, which stresses critical awareness and ethical reflection alongside technical skills. For example, predictive analytics were described as enhancing personalised service delivery, but librarians emphasised the need to question how demographic data is used.

Additionally, AI literacy tools were recognised as cognitive partners that assist in generating subject headings and bibliographic entries. This echoes Laupichler et al.'s (2022) argument that AI literacy fosters "collaborative intelligence" between humans and machines.

4.3. Challenges Associated with AI Literacy in Academic Libraries

Despite positive feedback, respondents pointed out serious challenges. Most mentioned issues such as low budgets, misinterpretation of AI outputs, and gaps in digital literacy. One librarian explained:

> *"Without basic knowledge of computer science or ethics, it is difficult to judge whether an AI tool is reliable."*

Another added:

> *"There is no standard training; we are just figuring things out as we go, which makes our practices inconsistent."*

These challenges align with Tella et al. (2023) and Ogungbenro et al. (2025), who identify poor infrastructure and limited digital skills as major barriers in African academic libraries. Importantly, the findings question whether global AI literacy models, developed largely in Western contexts, are fully applicable in African settings. Librarians emphasised the need for localised adaptation

of AI literacy frameworks that account for indigenous knowledge systems and infrastructural realities.

This critical engagement underscores that while AI literacy offers significant benefits, its integration into academic librarianship requires structured training, institutional support, and ethical oversight. The findings extend existing models (Ng et al., 2021; Long & Magerko, 2020) by demonstrating how librarians in resource-constrained contexts negotiate AI literacy through grassroots initiatives, peer learning, and adaptive practices.

4.4. Implications for Theory

The findings of this study contribute to the theoretical development of AI literacy in academic librarianship by situating global models within the lived experiences of librarians in a developing-country context. Existing frameworks, such as Long and Magerko's (2020) AI Literacy Framework and Ng et al.'s (2021) model, emphasise competencies in understanding, using, and critically evaluating AI systems. The experiences of librarians in Kwara State both confirm and extend these models. First, the emphasis on accessibility and inclusivity through tools like automated transcription and image recognition demonstrates how AI literacy supports equity in information access, a dimension less emphasised in prior frameworks. Second, the librarians' accounts of grassroots adoption and peer learning highlight a bottom-up pathway to AI literacy development, contrasting with the institutionalised training programs assumed in much of the literature. This suggests the need to incorporate informal and community-driven learning mechanisms into AI literacy theory. Third, the challenges identified, particularly infrastructural deficits, ethical concerns, and uneven digital skills, underscore the importance of contextual adaptation of AI literacy models. Global frameworks often assume robust infrastructure and standardised training, but the findings here reveal that librarians in resource-constrained environments negotiate AI literacy through improvisation, selective adoption, and critical reflection. This extends theoretical discussions by foregrounding the role of local context, institutional support, and ethical oversight as essential components of AI literacy. Finally, the study demonstrates that AI literacy in librarianship is not merely technical but deeply tied to professional identity, ethics, and the preservation of core library values. By integrating these dimensions, the research advances a more holistic understanding of AI literacy that bridges global theory with African practice.

5. Conclusion

This study explored the application, perceived benefits, and challenges of AI literacy in academic libraries, focusing on the lived experiences of fifteen librarians in Kwara State, Nigeria. The findings reveal that librarians actively employ AI literacy in areas such as accessibility services, personalised learning, staff training, citation management, and collection development. Tools including chatbots, NLP systems, ResearchRabbit, EndNote, Google Assistant, and Google Translate were identified as central to enhancing service delivery. Importantly, librarians emphasised that AI literacy should complement human expertise rather than replace it, reinforcing the profession's role in guiding ethical and responsible use of technology. While AI literacy offers transformative benefits, such as improved access, efficiency, and adaptability, its integration requires strategic planning, institutional support, and ethical oversight to ensure sustainability and alignment with core library values.

5.1. Limitations

Despite its contributions, the study has several limitations. First, the sample size was relatively small, comprising fifteen librarians from a single Nigerian state, which limits the generalisability of the findings to broader African or global contexts. Second, the reliance on structured interviews, without triangulation from other methods such as observations or document analysis, may have restricted the depth of contextual insights. Third, the study focused exclusively on librarians' perspectives, excluding the views of students, faculty, and administrators, which could have provided a more comprehensive understanding of AI literacy in academic environments. Finally, given the rapid pace of AI development, some tools and practices identified may evolve quickly, potentially limiting the long-term applicability of the findings.

5.2. Future Research

Future studies should expand the scope by including larger and more diverse samples across multiple regions to capture variations in infrastructure, policy, and cultural contexts. Comparative research between African and non-African academic libraries would help assess the adaptability of global AI literacy models to local realities. Methodologically, mixed-methods approaches, combining interviews with surveys, ethnographic observations, or usage analytics, could provide richer and more triangulated insights. Including the perspectives of students, faculty, and policymakers would broaden understanding of how AI literacy influences teaching, learning, and institutional governance. Longitudinal studies are also recommended to track the evolution of AI literacy practices over time, particularly in response to emerging technologies. Finally, future research should focus on developing localised AI literacy frameworks that integrate indigenous knowledge systems, ethical considerations, and infrastructural realities, ensuring that AI adoption in African academic libraries is both sustainable and contextually relevant.

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Authors' Contributions

Adeniyi Isaiah Kayode: Writing original draft preparation. Ideas; formulation or evolution of overarching research goals and aims. **George Osas Eromosele:** Expanded the review of existing scholarship on AI literacy and academic librarianship, integrating global perspectives to strengthen the study's foundation. **Sunday Adebisi Oguntayo:** Co-wrote sections of the findings and discussion, particularly focusing on the perceived benefits of AI literacy in professional practice.

Conflict of Interests

The authors declare that there are no conflicts of interest regarding the conduct of this study, the interpretation of the findings, or the preparation of this manuscript. The research was carried out independently, without any financial, institutional, or personal relationships that could be perceived as influencing the outcomes.

AI Usage Declaration

Artificial intelligence (AI) tools were used only in supportive roles during the preparation of this study. Specifically, AI applications assisted with grammar and style refinement (Grammarly, Copilot). No AI systems were employed to generate, fabricate, or alter primary data, and all analysis, interpretation, and conclusions. The author(s) remain fully responsible for the content of this manuscript.