



Awareness and readiness to integrate AI with traditional library services

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ABSTRACT

The rapid development of AI has created opportunities for academic libraries to enhance traditional library services. However, awareness of AI does not necessarily translate into readiness or actual utilization. This study aimed to examine library staff's awareness, readiness, and utilization of AI, potential areas for AI integration, and barriers to integrating AI with traditional library services in selected academic libraries in Kwara State. A quantitative descriptive survey design was employed using a structured questionnaire administered to randomly selected library staff. Of the questionnaires distributed, 120 were valid and analyzed using frequency counts and percentages. The findings indicate that library staff generally recognize the potential of AI, but their readiness to integrate it into traditional library services remains limited. AI was perceived as particularly suitable for information-oriented and user-support services, especially reference services, while its actual utilization remained relatively low. The findings further reveal that concerns about job displacement constitute the most prominent barrier, followed by shortages of AI expertise, unreliable power supply, inadequate infrastructure, and limited government support. The study concludes that effective AI integration requires continuous staff training, adequate technological infrastructure, institutional support, and policies that position AI as a complementary technology while preserving the professional and human-centered functions of library staff.

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ABSTRAK

Perkembangan AI membuka peluang bagi perpustakaan akademik untuk meningkatkan layanan perpustakaan tradisional. Namun, kesadaran terhadap AI tidak selalu diikuti oleh kesiapan dan pemanfaatan yang nyata. Penelitian ini bertujuan untuk mengkaji kesadaran, kesiapan, pemanfaatan, potensi integrasi AI, serta hambatan integrasi AI dalam layanan perpustakaan tradisional di perpustakaan akademik terpilih di Kwara State. Penelitian ini menggunakan desain survei deskriptif kuantitatif dengan kuesioner terstruktur yang diberikan kepada staf perpustakaan yang dipilih secara acak. Sebanyak 120 kuesioner valid diukur menggunakan frekuensi dan persentase. Hasil penelitian secara umum menunjukkan bahwa staf perpustakaan telah mengenal potensi AI, tetapi kesiapan untuk mengintegrasikannya ke dalam layanan perpustakaan tradisional masih terbatas. AI dipandang paling sesuai untuk layanan yang berorientasi pada informasi dan dukungan pengguna, khususnya layanan referensi, sementara pemanfaatannya dalam praktik masih relatif rendah. Kekhawatiran akan kehilangan pekerjaan menjadi hambatan utama, diikuti oleh kekurangan tenaga ahli AI, pasokan listrik yang tidak andal, keterbatasan infrastruktur, serta kurangnya dukungan pemerintah. Kesimpulan penelitian menunjukkan bahwa integrasi AI memerlukan pelatihan berkelanjutan, infrastruktur teknologi yang memadai, dukungan institusional, serta kebijakan yang menempatkan AI sebagai pelengkap teknologi dengan tetap mempertahankan fungsi profesional dan humanis staf perpustakaan.

Kata Kunci: integrasi AI; pelatihan berkelanjutan; penerapan teknologi; perpustakaan akademik

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INTRODUCTION

The rapid development of information and communication technology has transformed how academic libraries organize information resources and provide services. Among emerging technologies, Artificial Intelligence (AI) has become increasingly relevant because of its potential to automate routine tasks, support information discovery, facilitate user assistance, and improve the efficiency of library operations (Barsha & Munshi, 2024; Onunka et al., 2023). AI can be applied to information retrieval, recommendation systems, virtual reference services, cataloging, metadata generation, collection management, and user support. The emergence of generative AI has further expanded these possibilities, requiring academic libraries to respond to technological developments while maintaining their essential roles in supporting teaching, learning, research, and scholarly communication (Oyighan et al., 2024; Oyedokun, 2025). The adoption of AI, however, does not necessarily require the replacement of traditional library services.

Academic library services continue to rely on professional expertise, human judgment, interpersonal communication, and direct user assistance (Khan et al., 2024). AI can therefore function as a complementary technology that supports librarians while preserving their professional roles. Achieving this balance requires more than access to AI tools, as effective integration is also influenced by staff awareness, readiness, technological competencies, infrastructure, funding, institutional support, and perceptions of changing professional roles (Adewojo et al., 2026; Trajkovski, 2024). Previous studies have shown that AI adoption in academic libraries remains uneven, particularly in Nigeria and Africa. Nigerian academic librarians have demonstrated awareness of AI, but institutional readiness has been affected by inadequate funding, technical expertise, infrastructure, power supply, and staff training (Ajani et al., 2022).

Studies in Kwara State have similarly reported positive perceptions of AI alongside challenges related to internet connectivity, expertise, infrastructure, readiness, and utilization (Akanbi et al., 2025; Eiriemiokhale & Sulyman, 2023; Fagbola & Egbebi, 2025). At the broader African level, AI has been recognized for its potential to support resource discovery, collection management, virtual assistance, and information provision. However, limited awareness, financial constraints, and ethical concerns remain barriers to adoption (Nkomo & Matli, 2025). These findings indicate that AI adoption involves interconnected technological, human, organizational, and professional dimensions. Although previous studies have examined AI awareness, readiness, utilization, and implementation challenges in Kwara State, these dimensions warrant further consideration regarding the continuity of traditional library services.

Existing research has already addressed awareness and readiness to integrate AI with traditional library services in the state. Therefore, the research gap does not lie in the absence of studies on AI in Kwara State, but in the need to better understand how awareness, readiness, utilization, potential areas of integration, and implementation barriers relate to efforts to balance technological innovation with established professional library practices. The scientific novelty of this study lies in its integrated examination of these dimensions in relation to the continuity of traditional library services. The study views AI not merely as a technological innovation but as a complementary technology whose integration should preserve librarians' professional and human-centered functions. By bringing together awareness, readiness, potential areas for integration and utilization, and barriers in a single empirical investigation, the study seeks to provide a more comprehensive understanding of the conditions required for balanced AI integration in academic library services.

Despite the growing availability of AI and librarians' increasing awareness of its potential, effective integration remains constrained by differences in readiness, technological competencies, infrastructure, financial resources, institutional support, and perceptions of professional roles (Shahzad et al., 2026; Zondi et al., 2024). The research problem, therefore, concerns the gap between AI's potential and its meaningful integration into traditional library services. This gap involves not only the extent to which library staff are

aware of and prepared to use AI, but also the services that can appropriately incorporate AI, as well as the barriers that may prevent its effective implementation while maintaining professional and human-centered library functions. Four research questions guide the study. The first concerns the level of awareness and readiness of library staff regarding the integration of AI with traditional library services. The second concerns the types of traditional library services that can be integrated with AI to support existing library practices and improve service delivery. The third concerns the extent to which library staff use AI to perform and support traditional library services.

The fourth concerns the barriers encountered by library staff in integrating AI with traditional library services, including challenges related to technological competencies, infrastructure, institutional support, funding, and other factors that may influence effective implementation. Accordingly, this study aims to investigate the awareness, readiness, and utilization of AI, as well as its integration with traditional library services, among library staff in selected academic libraries in Kwara State. Specifically, it examines staff awareness and readiness, identifies traditional services that AI can support, determines the extent of AI utilization, and investigates barriers to integration. The study is expected to provide empirical evidence to inform the development of AI adoption strategies that enhance library services while preserving their professional and human-centered functions. The findings are also expected to inform decisions on staff training, infrastructure, institutional support, and responsible AI policies, while contributing to the literature on balancing technological innovation and traditional library services in academic libraries in Nigeria and across Africa.

LITERATURE REVIEW

Academic Libraries and Traditional Library Services

Academic libraries are integral to higher education institutions because they support teaching, learning, research, and access to scholarly information. Their traditional functions include providing reference assistance, information retrieval, circulation, cataloging, collection management, and user support. Although the delivery of these services has increasingly shifted toward digital environments, their fundamental role in supporting academic activities remains important. The development of information technology, therefore, does not eliminate the functions of academic libraries but requires libraries to adapt how their services are organized and delivered to meet changing information needs (Bashorun et al., 2024; Okunlaya et al., 2022). In Nigeria, this transformation has become increasingly important as academic libraries seek to improve service delivery while responding to technological developments and resource constraints (Agboke & Oladokun, 2024).

Traditional library services should not necessarily be viewed as practices that must be abandoned because of technological development. Rather, existing services can provide a foundation for technological innovation through the appropriate integration of AI. Previous studies have identified several library functions that can benefit from AI, including reference services, information retrieval, cataloging, classification, indexing, circulation, and other repetitive library operations (Asemi et al., 2021; Hasan et al., 2024; Tzanova, 2020; Yudov, 2023). AI can support these functions by reducing repetitive tasks, improving access to information, and increasing operational efficiency. However, AI integration should remain complementary to librarians' professional responsibilities because activities requiring information evaluation, professional judgment, ethical considerations, and interaction with users cannot be reduced entirely to technological processes (Ahmed et al., 2024; Mallikarjuna, 2024).

The Nigerian context makes the relationship between traditional services and AI integration particularly important. Studies have shown that academic libraries in Nigeria are increasingly aware of AI and its potential applications. However, actual adoption remains constrained by inadequate infrastructure, limited funding, shortage of technical expertise, power supply problems, and concerns about changes in librarians'

professional roles (Ajani et al., 2022; Igbo et al., 2025). Research specifically conducted in Kwara State has similarly reported growing awareness of AI alongside relatively limited utilization and challenges in implementing AI-supported library services (Akanbi et al., 2025; Eiriemiokhale & Sulyman, 2023). These conditions suggest that AI integration should be understood not simply as technological modernization but as a process of enhancing existing library services while maintaining their professional and human-centered functions. This perspective provides the basis for examining library staff awareness, readiness, and utilization; potential areas for integration; and barriers to AI adoption in selected academic libraries in Kwara State.

Artificial Intelligence in Academic Library Services

Artificial intelligence (AI) encompasses technologies that enable computer systems to perform tasks associated with human cognitive abilities, including learning, language processing, pattern recognition, information retrieval, and decision-making. In academic libraries, these capabilities can be applied through intelligent search and discovery systems, recommendation tools, chatbots, virtual reference services, automated indexing, cataloging, collection management, and other forms of service automation (Asemi et al., 2021; Das & Islam, 2021; Oyelude, 2021). Systematic reviews have shown that AI research in libraries has expanded across multiple areas of library and information science. However, many applications remain at an experimental or developmental stage rather than being fully embedded in routine library operations (Das & Islam, 2021). The growing use of AI, therefore, creates opportunities for academic libraries to improve information access, service responsiveness, and operational efficiency.

Research has demonstrated that AI has considerable potential to transform academic library services, particularly through automation and intelligent information provision. Studies have identified reference and information services as among the most prominent areas of AI application, including chat-based assistance, automated responses, information discovery, and personalized recommendations (Ayinde et al., 2025; Tella, 2023). AI has also been used for indexing, document matching, content summarization, and other information management activities (Oyelude, 2021). In the African context, AI has been identified as a promising technology for improving academic library operations and information service delivery. However, its implementation is influenced by technological, financial, institutional, and human-resource conditions (Echedoma & Okuonghae, 2021). These findings indicate that the value of AI in academic libraries extends beyond automation to include the development of more responsive, user-oriented information services.

Despite these opportunities, effective AI implementation depends on librarians' knowledge, competencies, perceptions, and institutional capacity. Research among academic librarians in Canada and the United States found that librarians recognized the relevance of AI but also identified a need for additional training concerning its applications in libraries (Hervieux & Wheatley, 2021). Studies of African and Nigerian academic libraries similarly indicate that inadequate infrastructure, limited technical expertise, funding constraints, and insufficient staff preparation can restrict AI adoption (Abayomi et al., 2021; Echedoma & Okuonghae, 2021). More recent systematic evidence further indicates that funding, digital competencies, institutional support, and staff retraining remain important conditions for AI adoption in academic libraries (Ayinde et al., 2025). Consequently, the availability of AI technologies alone does not guarantee successful implementation. Library staff need sufficient awareness and readiness to determine how AI can complement existing services while maintaining professional judgment, ethical responsibilities, and the human-centered functions of academic libraries.

Awareness and Readiness for AI Integration

Awareness is an important initial condition in technology adoption because users need to understand the nature, functions, potential benefits, risks, and implications of a technology before they can meaningfully consider its use. In the context of AI, awareness involves not only familiarity with AI tools but also an understanding of their capabilities, limitations, ethical implications, and relevance to professional activities (Aguilar-Cruz & Salas-Pilco, 2025; Al-Abdullatif, 2025). Readiness, in contrast, is a broader condition that reflects the extent to which individuals and organizations possess the knowledge, competencies, resources, infrastructure, and institutional support required to adopt and implement new technologies (Anomah, 2025). Technology readiness is therefore influenced by both positive perceptions, such as optimism and perceived usefulness, and inhibiting factors, including discomfort, uncertainty, and perceived insecurity associated with technological change (Blut & Wang, 2020).

Empirical research indicates that awareness does not necessarily translate into readiness or actual use of technology. Studies of AI adoption have shown that individuals may recognize the usefulness and potential of AI while remaining uncertain about their ability to use it effectively, particularly when they lack technical competencies, training, or institutional support (Grassini, 2023; Schepman & Rodway, 2020). In library environments, the adoption of AI is influenced similarly by librarians' knowledge, professional competencies, organizational preparedness, and access to appropriate technological infrastructure (Harisanty et al., 2024; Oladokun & Umar, 2025). Research on academic libraries has further emphasized that AI adoption requires staff development and institutional preparation, as librarians need to acquire new skills and adapt existing professional practices to emerging technologies (Cox et al., 2019). These findings suggest that awareness should be examined as an initial dimension of AI adoption. At the same time, readiness provides a broader indication of whether library staff and their institutions are prepared to translate awareness into practice.

The distinction between awareness, readiness, and utilization is therefore essential for examining AI integration in academic libraries. Awareness concerns the extent to which library staff recognize and understand AI and its possible applications; readiness concerns their preparedness and capacity to adopt AI; and utilization concerns the extent to which AI is actually employed in library activities (Wang et al., 2026). These dimensions are related but should not be treated as equivalent because a staff member may be aware of AI without possessing the skills, resources, or institutional conditions necessary for its implementation (Ali et al., 2026; Begum & Elahi, 2025; Jan et al., 2024). Examining these dimensions, together with potential areas for integration and implementation barriers, can therefore provide a more comprehensive understanding of the conditions underlying AI adoption in academic libraries. This perspective is particularly relevant to the present study because it enables investigation into whether awareness among library staff is accompanied by sufficient readiness and actual use of AI in traditional library services.

METHODS

This study employed a quantitative descriptive survey design to examine library staff's awareness and readiness to integrate artificial intelligence (AI) with traditional library services in selected academic libraries in Kwara State. The survey approach was appropriate because the study collected standardized responses from library staff on their awareness, readiness, potential areas for AI integration and utilization, and barriers to AI use. The population comprised library staff in the selected academic libraries in Kwara State. A total of 150 respondents were randomly selected, and 150 questionnaires were distributed. Of these, 120 questionnaires were completed and returned, representing an 80% response rate. The 120 valid responses were used for analysis. Data were collected using a structured questionnaire titled

"Awareness and Readiness to Use AI with Traditional Library Services in Selected Academic Libraries in Kwara State."

The questionnaire consisted of two sections. Section A collected respondents' demographic information, while Section B consisted of five parts addressing AI awareness, readiness to integrate AI with traditional library services, traditional library services that could be integrated with AI, AI utilization, and barriers to AI use. The questionnaire included Yes/No items to capture respondents' views on AI awareness and integration, as well as response categories on readiness, utilization, potential areas for integration, and barriers. The questionnaires were administered to the selected library staff in the participating academic libraries in Kwara State. After collection, the 120 valid responses were coded and analyzed using descriptive statistics, including frequency counts and percentages. These statistics were used to describe respondents' demographic characteristics and their responses regarding AI awareness, readiness, potential areas for integration and utilization, and barriers. The results were presented in tables and interpreted in line with the research questions.

RESULTS AND DISCUSSION

This section presents descriptive statistics from the analysis of 120 questionnaires returned by library staff from the selected academic libraries in Kwara State, followed by an interpretation of the findings in relation to the theoretical framework and prior studies discussed in the preceding sections. The data were analyzed using simple frequency counts and percentage distributions.

Respondent Profile

Before addressing the research questions, the demographic characteristics of the respondents, in terms of gender and work experience, are presented in **Table 1**.

Table 1. Demographic Profile of Respondents

Characteristic	Category	f	%
Gender	Male	53	44.2
	Female	67	55.8
	Total	120	100.0
Working experience	1 - 5 years	27	22.5
	6 - 7 years	53	44.2
	8 - 10 years	40	33.3
	Total	120	100.0

Source: Field Survey, 2025

Table 1 presents the demographic characteristics of the respondents who participated in this study. The distribution of respondents by gender indicates that female respondents constituted the majority, with 67 respondents (55.8%), while male respondents accounted for 53 respondents (44.2%). In terms of working experience, the largest proportion of respondents had six to seven years of professional experience, consisting of 53 respondents (44.2%). This was followed by 40 respondents (33.3%) who had worked for eight to ten years. Meanwhile, 27 respondents (22.5%) reported having between one and five years of working experience, representing the smallest proportion of the sample.

Overall, the respondent profile indicates that participants were predominantly female and had several years of professional experience, suggesting that most had sufficient exposure to traditional library services and workplace practices to provide informed perspectives on integrating artificial intelligence (AI) into library services. The demographic profile of the respondents provides important context for interpreting

the findings of this study, particularly regarding their awareness, perceptions, and preparedness for the use of AI in library settings. Given their varying levels of professional experience, respondents may have encountered different technological developments and changes in library service practices throughout their careers. Therefore, the findings are presented in accordance with the four research questions that guided the study, beginning with respondents' awareness of and readiness to integrate AI into traditional library services.

Awareness and Readiness to Integrate AI with Traditional Library Services

The first research question sought to determine the level of awareness and readiness of library staff to integrate artificial intelligence with traditional library services. The distribution of responses on the level of readiness is presented in **Table 2**.

Table 2. Level of Readiness to Integrate Artificial Intelligence with Traditional Library Services

No	Level of Readiness	f	%
1	Partially ready	45	37.5
2	Not ready	55	45.8
3	Always ready	20	16.7
Total		120	100.0

Source: Field Survey, 2025

Table 2 presents respondents' levels of readiness to integrate artificial intelligence (AI) with traditional library services. The findings revealed that the largest proportion of respondents, 55 individuals (45.8%), reported that they were not ready to integrate AI into existing library services. Meanwhile, 45 respondents (37.5%) indicated they were partially ready, and only 20 (16.7%) were fully or consistently prepared to adopt AI in their professional practices. These results suggest that although awareness of AI may exist among library professionals, a considerable number of respondents still experience uncertainty or limitations in knowledge, skills, institutional support, or confidence in applying AI technologies in library settings.

To gain a more comprehensive understanding of this issue, respondents' readiness levels need to be considered alongside their perceptions of which traditional library services are most appropriate for AI implementation. Examining these perceptions provides further insight into the areas where AI is viewed as beneficial and feasible, thereby offering a clearer picture of potential opportunities for technology adoption in libraries. Accordingly, the following subsection discusses the traditional library services that respondents identified as suitable for AI integration.

Traditional Library Services Suitable for AI Integration

The second research question examined which traditional library services could be integrated with artificial intelligence. **Table 3** presents the distribution of responses.

Table 3. Traditional Library Services That Could Be Integrated with Artificial Intelligence

No	Library Service	f	%
1	Circulation	10	8.3
2	Acquisition	10	8.3
3	Cataloguing	0	0.0
4	Selective dissemination of information (SDI)	15	12.5
5	Current awareness services	15	12.5
6	Reference services	25	20.8
7	User education	15	12.5

No	Library Service	f	%
8	Lending services	15	12.5
9	Printing and photocopying	0	0.0
10	Reservation services	10	8.3
11	Library tour	5	4.2
Total		120	100.0

Source: Field Survey, 2025

As shown in **Table 3**, reference services recorded the highest frequency, with 25 respondents (20.8%) identifying this service as suitable for AI integration. This was followed by selective dissemination of information, current awareness services, user education, and lending services, each identified by 15 respondents (12.5%). Circulation, acquisition, and reservation services were each identified by 10 respondents (8.3%), while library tours were identified by 5 respondents (4.2%). Notably, cataloging and printing/photocopying services were not identified by any respondents as suitable for AI integration.

These findings suggest that respondents tended to perceive AI as more applicable to information and user-oriented services, particularly those involving information provision, information dissemination, and direct assistance to library users, rather than to more routine or conventional operational services. However, identifying library services as suitable for AI integration does not necessarily indicate that AI has already been adopted in practice. Therefore, it is important to examine the extent to which respondents have actually utilized AI when performing traditional library services. The following subsection presents the findings on respondents' actual utilization of AI in their day-to-day library service activities.

Utilization of AI in Traditional Library Services

The third research question addressed the extent of AI utilization in traditional library services. The results are presented in **Table 4**.

Table 4. Level of Utilization of Artificial Intelligence in Traditional Library Services

No	Level of Utilization	f	%
1	Frequently used	20	16.7
2	Partially used	47	39.2
3	Never used	53	44.2
Total		120	100.0

Source: Field Survey, 2025

Table 4 shows that 53 respondents (44.2%) had never used artificial intelligence (AI) to perform traditional library services, while 47 respondents (39.2%) reported partial use of AI. In contrast, only 20 respondents (16.7%) reported frequently using AI to carry out traditional library service activities. These findings demonstrate a noticeable gap between respondents' recognition of AI's potential suitability for library services and its actual use in practice. Although some respondents had begun incorporating AI into their work, the relatively high proportion who had never used AI suggests that adoption of AI within traditional library services remains limited.

The limited utilization of AI may be influenced by various challenges faced by library staff, including insufficient technical knowledge, limited training opportunities, lack of institutional support, concerns regarding the reliability of AI-generated information, and inadequate technological infrastructure. Identifying these barriers is therefore essential to understanding why the integration of AI remains relatively limited despite its perceived potential. Accordingly, the following subsection presents the barriers encountered by library staff in integrating AI with traditional library services.

Barriers to AI Integration with Traditional Library Services

The fourth research question investigated the barriers encountered by library staff in integrating artificial intelligence with traditional library services. **Table 5** presents the distribution of responses.

Table 5. Barriers Encountered by Library Staff in Integrating Artificial Intelligence with Traditional Library Services

No	Barrier	f	%
1	Unreliable power supply	25	20.8
2	Inadequate infrastructure	15	12.5
3	Shortage of AI experts	30	25.0
4	Job displacement concerns	40	33.3
5	Lack of government support	10	8.3
Total		120	100.0

Source: Field Survey, 2025

As presented in **Table 5**, concern about job displacement constituted the most frequently reported barrier to AI integration, identified by 40 respondents (33.3%). This was followed by a shortage of AI experts, reported by 30 respondents (25.0%); unreliable power supply, reported by 25 respondents (20.8%); inadequate infrastructure, reported by 15 respondents (12.5%); and a lack of government support, reported by 10 respondents (8.3%). These findings indicate that the barriers to AI integration extend beyond technological limitations and also involve human and institutional factors. In particular, the prominence of concerns about job displacement suggests that library staff may perceive AI not only as a technological tool but also as a potential threat to existing roles and responsibilities.

At the same time, the shortage of AI expertise, unreliable electricity supply, and inadequate infrastructure highlight structural challenges that may limit the effective and sustainable adoption of AI in library environments. Taken together, the findings from Tables 2 to 5 reveal a consistent pattern: although respondents identified several traditional library services as potentially suitable for AI integration, their actual readiness and utilization remained relatively limited. This discrepancy appears to be influenced by both individual concerns and broader institutional and infrastructure constraints. The findings therefore provide an important basis for interpreting the broader implications of AI adoption in traditional library services. The following section discusses these findings in relation to previous studies, relevant theoretical perspectives, and the practical context of AI integration in library services.

Discussion

The results indicate a clear gap between awareness of artificial intelligence (AI) and actual readiness to integrate it with traditional library services, as the majority of respondents were either not ready or only partially ready to do so. This finding directly supports the conceptual distinction established in the literature review between awareness, readiness, and utilization. Awareness refers to the extent to which library staff recognize and understand AI and its potential applications. In contrast, readiness encompasses the knowledge, competencies, resources, infrastructure, and institutional support required to translate such awareness into practice (Anomah, 2025). Technology readiness is also shaped not only by positive perceptions such as optimism and perceived usefulness but also by inhibiting conditions, including discomfort, uncertainty, and perceived insecurity associated with technological change (Blut & Wang, 2020). Therefore, the relatively low level of readiness identified in the present study suggests that the challenge facing library staff in the selected academic libraries in Kwara State is not necessarily a lack of awareness of AI, but rather a limited capacity and preparedness to implement it effectively.

This finding is also consistent with the empirical literature reviewed in this study. Nigerian academic librarians have demonstrated awareness of AI while institutional readiness remains constrained by inadequate funding, limited technical expertise, and insufficient staff training (Ajani et al., 2022). Similarly,

positive perceptions of AI among university librarians in Kwara State have been accompanied by concerns regarding connectivity and technical expertise (Eiriemiokhale & Sulyman, 2023). Growing awareness of AI alongside relatively limited utilization has also been reported among librarians in Kwara State (Akanbi et al., 2025). These findings reinforce the argument that awareness represents an initial condition of technology adoption but does not, by itself, guarantee readiness for implementation. Individuals may recognize the usefulness and potential of AI while remaining uncertain about their ability to use it effectively when adequate competencies, training, and institutional support are lacking (Grassini, 2023; Schepman & Rodway, 2020).

Compared with research reporting moderate levels of readiness among librarians in Kwara State university libraries, the lower proportion of respondents who reported being fully ready in the present study may reflect differences in sample composition, particularly because the present study included general library staff rather than professional librarians only (Fagbola & Egbebi, 2025). The findings further support the literature review's distinction between readiness and actual utilization. In the present study, a substantial proportion of respondents reported that they had never or only partially used AI in performing traditional library services. This pattern demonstrates that the presence of awareness and even some degree of readiness does not necessarily result in routine utilization. Awareness, readiness, and utilization are related but distinct dimensions of AI adoption, as library staff may be aware of AI without possessing the skills, resources, or institutional conditions necessary for implementation (Ali et al., 2026; Begum & Elahi, 2025; Jan et al., 2024).

AI adoption in library environments is similarly influenced by staff competencies, organizational preparedness, and access to appropriate technological infrastructure (Harisanty et al., 2024; Oladokun & Umar, 2025). The low utilization observed in the present study can therefore be interpreted as evidence that the transition from awareness to actual practice requires not only individual willingness but also institutional conditions that enable staff to experiment with and consistently apply AI technologies. The identification of reference services as the area most frequently considered suitable for AI integration is also consistent with the literature reviewed in this study. Previous research has identified reference and information services as prominent areas for AI applications, particularly through chat-based assistance, automated responses, information discovery, and personalized recommendations (Ayinde et al., 2025; Tella, 2023).

The present findings therefore suggest that library staff recognize the potential of AI, particularly in services involving information provision and direct responses to users' information needs. This is consistent with the view that AI can enhance information access, service responsiveness, and operational efficiency while supporting rather than eliminating the functions of academic libraries (Asemi et al., 2021; Hasan et al., 2024; Tzanova, 2020). Traditional library services can therefore provide a foundation for technological innovation rather than being regarded as functions to be abandoned due to technological development (Bashorun et al., 2024; Okunlaya et al., 2022). The absence of respondents identifying cataloging as suitable for AI integration, despite previous studies identifying cataloging, indexing, classification, and related information-management activities as potential areas for AI applications, represents an interesting divergence between the perceived suitability reported in the present study and the potential identified in previous literature (Asemi et al., 2021; Oyelude, 2021). This difference may indicate that respondents' perceptions are shaped more by their current familiarity with AI applications than by the full range of AI capabilities described in the literature.

In other words, library staff may be more likely to identify AI applications that are visible and directly connected to user-facing services than applications involving technical or back-end processes. This finding further highlights the importance of staff training and exposure to diverse AI applications, particularly because automated indexing, cataloging, classification, and other information-management activities have been identified as potential areas for AI-supported efficiency improvements (Das & Islam, 2021; Oyelude,

2021). The barriers identified in the present study further explain the gap between awareness, readiness, and utilization. Concern about job displacement emerged as the most frequently reported barrier, followed by a shortage of AI experts, unreliable power supply, inadequate infrastructure, and lack of government support. The prominence of concerns about job displacement is particularly relevant to the literature review's argument that AI integration should remain complementary to librarians' professional responsibilities.

Activities involving information evaluation, professional judgment, ethical considerations, and interaction with users cannot be reduced entirely to technological processes (Ahmed et al., 2024; Mallikarjuna, 2024). From this perspective, concerns about job displacement may reflect uncertainty about how professional roles will change as AI becomes more integrated into library services. Rather than indicating that AI will necessarily replace library staff, the finding may suggest a need to clarify how AI can redistribute routine tasks while allowing library professionals to focus more strongly on activities requiring human judgment, ethical reasoning, and user interaction. The shortage of AI experts, unreliable power supply, and inadequate infrastructure identified in the present study are also consistent with the Nigerian and African literature reviewed earlier. Inadequate infrastructure, limited funding, shortages of technical expertise, and power-supply problems have been identified as important constraints on AI adoption in Nigerian academic libraries (Ajani et al., 2022; Echedoma & Okuonghae, 2021; Igbo et al., 2025).

Funding, digital competencies, institutional support, and staff retraining have also been identified as important conditions for successful AI adoption in academic libraries (Ayinde et al., 2025). The convergence of these previous findings and the present results indicates that AI integration in academic libraries in Kwara State is constrained by both human resource and infrastructure factors. As a result, increasing awareness alone is unlikely to produce substantial improvements in AI utilization unless it is accompanied by staff development, adequate infrastructure, institutional support, and opportunities for practical engagement with AI technologies (Abayomi et al., 2021; Echedoma & Okuonghae, 2021). Taken together, the findings provide empirical support for the conceptual framework established in the literature review, in which awareness, readiness, and utilization are treated as interconnected but distinct dimensions of AI integration. The results suggest that awareness among library staff has developed to a greater extent than their readiness and actual utilization.

At the same time, the identification of potentially suitable services demonstrates that respondents can recognize areas where AI may contribute to library operations, while the reported barriers indicate why this potential has not yet been fully translated into practice. This pattern reinforces the literature's argument that successful AI integration depends on the alignment of staff competencies, technological resources, institutional support, and professional considerations (Ayinde et al., 2025; Harisanty et al., 2024). AI integration in traditional library services should therefore be approached not simply as a process of technological adoption but as an organizational and professional transformation that enhances existing library functions through technology. In contrast, their human-centered and professional foundations are maintained. Several limitations should be acknowledged in interpreting these findings. The descriptive survey design used in this study enables identification of patterns in awareness, readiness, service integration, utilization, and barriers, but it does not establish causal relationships among these dimensions. Reliance on self-reported data may also introduce social desirability or recall bias, particularly in respondents' assessments of their own readiness and utilization of AI.

In addition, the study was limited to selected academic libraries in Kwara State, and the findings may not be generalizable to academic libraries in other regions of Nigeria or beyond, where infrastructural conditions, institutional policies, and levels of staff preparation may differ. Despite these limitations, the study contributes to the existing literature by empirically demonstrating the distinction between awareness, readiness, and utilization among library staff in the context of AI integration. In particular, the findings show that awareness of AI does not automatically translate into readiness or routine utilization, thereby

supporting the conceptual position developed in the literature review. The study also identifies job displacement concern as a prominent barrier alongside technical and infrastructural constraints. By examining awareness, readiness, potential areas for integration and utilization, and barriers within a single empirical investigation, the study provides an integrated understanding of the conditions required for the complementary integration of AI into traditional library services in selected academic libraries in Kwara State.

CONCLUSION

This study examined AI awareness, readiness, utilization, potential areas of integration, and barriers among library staff in selected academic libraries in Kwara State. The findings indicate that staff are generally aware of AI and its potential applications, but their readiness to integrate it into professional practices remains limited. This gap suggests that awareness alone is insufficient for effective adoption and must be supported by adequate competencies, confidence, institutional support, and technological resources. AI was perceived as most applicable to information-oriented and user-support services, particularly reference, selective dissemination of information, current awareness, user education, and lending services. However, actual utilization remains limited, indicating that awareness has not yet been translated into consistent practical use. This highlights the need for training, technological competence, infrastructure, and institutional support to facilitate responsible AI utilization.

The main barriers to AI integration were concerns about job displacement, shortage of AI expertise, unreliable power supply, inadequate infrastructure, and limited government support. These findings demonstrate that AI adoption involves human, professional, technological, and institutional factors. AI should therefore be positioned as a complementary technology that enhances library services while preserving librarians' professional judgment, ethical responsibilities, and human-centered support. Overall, AI integration in the selected academic libraries in Kwara State remains at an emerging stage. Academic library management and relevant stakeholders should strengthen staff training, infrastructure, institutional support, and responsible AI policies to help staff progress from awareness to readiness and effective utilization. Future research should examine broader library contexts and use inferential or mixed-methods approaches to explore the factors influencing AI adoption.

AUTHOR'S NOTE

The author declares that there is no conflict of interest regarding the publication of this article. The author affirms that the data and content of the article are free from plagiarism.

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