

ARTIFICIAL INTELLIGENCE TOOLS FOR ASSESSMENT IN LIBRARY AND INFORMATION SCIENCE EDUCATION

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Abstract

Artificial Intelligence (AI) has emerged as a transformative technology influencing education, information management, and library operations globally. In Library and Information Science (LIS) education, AI offers opportunities to improve library assessment through automated evaluation, learning analytics, intelligent information retrieval, and evidence-based decision-making. Despite its growing adoption worldwide, the application of AI in library assessment within LIS education in Nigeria remains relatively limited due to infrastructural, financial, and technical constraints. This study investigated the adoption of AI for library assessment in LIS education in Osun State University, the University of Ibadan, and Tai Solarin Federal University of Education, Ijebu-Ode, focusing on the extent of adoption, commonly used AI tools, perceived benefits, and challenges affecting implementation.

Keywords: Artificial Intelligence, Library Assessment, Library and Information Science Education, Academic Libraries, Higher Education, Nigeria.

Introduction

Artificial Intelligence (AI) has become one of the most transformative technologies influencing education, information management, and library services worldwide. By enabling computer systems to perform tasks that normally require human intelligence, such as learning, reasoning, language processing, and decision-making, AI is reshaping teaching, learning, research, and administrative processes in higher education (Russell & Norvig, 2021; Cox, 2023). In educational institutions, AI supports automated assessment, adaptive learning, learning analytics, intelligent tutoring systems, and personalized feedback, thereby improving instructional effectiveness and institutional decision-making (Kasneci et al., 2023; Tlili et al., 2023).

The increasing digital transformation of academic libraries has also accelerated the adoption of AI technologies in Library and Information Science (LIS). Applications such as automated cataloguing, intelligent information retrieval, chatbots, plagiarism detection, recommender systems, machine learning, and natural language processing have enhanced library operations by improving resource organization, service delivery, and user engagement (Asemi et al., 2021; Cox & Mazumdar, 2024). Consequently, LIS education is expected to equip future information professionals with competencies in AI-enabled information management, digital librarianship, and evidence-based assessment.

Library assessment remains an essential component of LIS education because it provides evidence for evaluating students' learning outcomes, library performance, instructional effectiveness, and service quality (Oakleaf, 2010). Traditionally, assessment in many LIS schools has relied on manual grading, examinations, assignments, and other conventional evaluation techniques.

Although these approaches remain relevant, they are often time-consuming, labour-intensive, and less efficient for managing the growing volume of digital information generated within contemporary academic environments. AI-powered assessment systems offer opportunities to improve assessment accuracy, automate repetitive tasks, provide timely feedback, analyse user behaviour, and support data-driven decision-making in libraries and higher education (Hooda et al., 2022; Swiecki et al., 2022).

Despite these benefits, the integration of AI into library assessment within Nigerian higher education remains at an emerging stage. Inadequate ICT infrastructure, unstable electricity supply, poor internet connectivity, limited funding, insufficient technical expertise, and the absence of comprehensive institutional policies continue to hinder effective implementation (Issa et al., 2020; Eleje et al., 2025). Ethical concerns relating to data privacy, transparency, algorithmic bias, accountability, and academic integrity further complicate the adoption of AI technologies in educational environments (Floridi & Cowls, 2019; Dwivedi et al., 2023). Consequently, many LIS programmes continue to depend largely on conventional assessment practices despite increasing global advances in AI-enabled educational technologies.

Although previous studies have examined AI applications in libraries and higher education, limited empirical attention has been devoted to AI-driven library assessment within LIS education in Nigeria. Most existing studies have focused on AI awareness, digital literacy, or technology adoption rather than the specific use of AI in assessment practices. This study addresses this gap by examining the extent of AI adoption, the AI tools used, the perceived benefits, and the challenges influencing AI-based library assessment in selected higher institutions in South-West Nigeria. The findings are expected to contribute to the advancement of evidence-based assessment practices, strengthen LIS education, and support the effective integration of AI into academic library operations.

Literature Review

Artificial Intelligence in Library and Information Science Education

Artificial Intelligence (AI) refers to computer systems capable of performing tasks that normally require human intelligence, including learning, reasoning, decision-making, language processing, and problem-solving (Russell & Norvig, 2021). AI has become a key driver of digital transformation in higher education by supporting adaptive learning, intelligent tutoring systems, automated assessment, learning analytics, and personalized feedback (Kasneci et al., 2023; Tlili et al., 2023). These technologies improve instructional effectiveness, facilitate evidence-based decision-making, and enhance students' learning experiences.

Within Library and Information Science (LIS) education, AI is increasingly influencing curriculum development, teaching practices, research activities, and professional training. AI applications such as machine learning, natural language processing, intelligent search systems, chatbots, recommender systems, and generative AI are transforming the way libraries organize information, deliver services, and support users (Cox, 2023; Cox & Mazumdar, 2024). Consequently, LIS programmes are expected to prepare graduates with competencies in AI-enabled information management and digital librarianship.

Artificial Intelligence and Library Assessment

Library assessment is the systematic collection and analysis of evidence to evaluate library resources, services, programmes, and learning outcomes for continuous quality improvement (Oakleaf, 2010). In LIS education, assessment supports curriculum evaluation, student learning, instructional effectiveness, and institutional accountability. Conventional assessment methods, including examinations, assignments, practical exercises, and manual grading, remain widely used but are often time-consuming and less efficient in digitally intensive learning environments.

AI technologies are increasingly improving assessment by automating grading, analysing learning behaviours, generating real-time feedback, and supporting data-driven decision-making (Hooda et al., 2022; Swiecki et al., 2022). Academic libraries also employ AI-powered tools such as plagiarism detection software, intelligent cataloguing systems, AI-enabled Online Public Access Catalogues (OPACs), chatbots, and learning analytics to improve information retrieval, service delivery, and user engagement (Cox et al., 2023). These innovations reduce routine workloads, improve assessment accuracy, and strengthen evidence-based library management.

Challenges of AI Adoption in LIS Education

Despite its potential, AI adoption in LIS education remains constrained by several institutional and technological factors, particularly in developing countries. Major barriers include inadequate ICT infrastructure, unstable electricity supply, poor internet connectivity, insufficient funding, limited technical expertise, and inadequate institutional support (Issa et al., 2020; Ademola-Popoola & Adesina, 2024; Eleje et al., 2025). Many institutions also lack AI-ready policies, digital infrastructure, and opportunities for continuous professional development, thereby limiting effective implementation.

Ethical considerations further influence AI adoption. Issues relating to data privacy, algorithmic bias, transparency, accountability, intellectual property, and academic integrity require institutions to establish appropriate governance frameworks for the responsible use of AI technologies (Floridi & Cowls, 2019; Dwivedi et al., 2023). Addressing these technological, organizational, and ethical challenges is essential for realizing the full potential of AI in library assessment and LIS education.

Empirical Review

Recent empirical studies demonstrate increasing interest in AI applications within academic libraries and LIS education. Achugbue (2025) reported that AI enhances academic library services through automated cataloguing, digital resource management, predictive

analytics, and AI-supported user services, while emphasizing the need for continuous professional development. Similarly, Odigie (2024) found that although librarians in Nigerian universities exhibited high awareness of AI tools such as ChatGPT and Google Gemini, institutional implementation remained limited because of inadequate infrastructure, insufficient technical expertise, and weak organizational support.

Further evidence by Igbo et al. (2025) indicates that successful AI implementation depends on institutional readiness, including adequate digital infrastructure, supportive policies, skilled personnel, and effective data governance. Likewise, Alao and Olajide (2025) reported that librarians' AI literacy and perceived usefulness significantly influence their readiness to adopt AI technologies. Collectively, these studies indicate that while awareness and acceptance of AI continue to increase, actual implementation remains constrained by infrastructural, financial, organizational, and human-capacity limitations.

Although previous studies have examined AI awareness, digital competencies, adoption readiness, and AI applications in libraries, limited empirical attention has focused specifically on AI-driven library assessment within LIS education in Nigeria. This study addresses that gap by investigating the extent of AI adoption, the AI tools employed, the perceived benefits, and the challenges affecting AI-based library assessment in selected higher institutions in South-West Nigeria.

Methodology

The study adopted a descriptive survey research design. The population comprised 361 respondents. The sample sizes includes 13 LIS lecturers, 21 librarians, and 327 undergraduate LIS students drawn from selected higher institutions offering accredited LIS programmes in South-West, Nigeria. Data were collected using a structured questionnaire titled Artificial Intelligence and Library Assessment Questionnaire (AILAQ). The instrument was validated

by experts in Library and Information Science and Measurement and Evaluation, while reliability was established using the test-retest method and Cronbach's Alpha coefficient. A total of 348 valid questionnaires were analysed, representing a 96.4% response rate. Descriptive statistics, including frequency counts, percentages, mean scores, and standard deviations, were used to answer the research questions.

Methodology

This study adopted a descriptive survey research design to investigate the application of Artificial Intelligence (AI) in library assessment within Library and Information Science (LIS) education in selected higher institutions in South-West Nigeria. The design was considered appropriate because it enabled the collection of data on respondents' perceptions and institutional practices without manipulating the study variables.

The study was conducted in three higher institutions offering accredited LIS programmes: Osun State University, Osogbo; the University of Ibadan; and Tai Solarin University of Education, Ijebu-Ode. The population comprised 361 respondents, consisting of 13 LIS lecturers, 21 librarians, and 327 undergraduate LIS students. Given the manageable size of the population, total enumeration was adopted to ensure adequate representation of all respondent categories.

Data were collected using a structured questionnaire titled **Artificial Intelligence and Library Assessment Questionnaire (AILAQ)**. The instrument contained items on demographic characteristics, the extent of AI adoption, AI tools used for library assessment, perceived benefits of AI, and challenges affecting AI implementation. Responses were measured using a four-point Likert scale.

The instrument underwent **face and content validation** by experts in Library and Information Science and Measurement and Evaluation. Reliability was established through the **test-retest method**, yielding

a reliability coefficient of **0.73**, indicating acceptable stability for the study.

A total of 361 questionnaires were administered, of which 348 valid copies were retrieved, representing a 96.4% response rate. Data were analysed using descriptive statistics, including frequencies, percentages, mean scores, and standard deviations. A criterion mean of 2.50 was used for decision-making, with mean scores of 2.50 and above interpreted as "Agreed", while values below 2.50 were interpreted as "Disagreed."

Ethical principles were observed throughout the study. Participation was voluntary, respondents were informed of the study's purpose, and confidentiality and anonymity were maintained to protect participants' identities.

Results

Characteristics of the Respondents

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	187	53.7
Female	161	46.3
Total	348	100

A total of **361 questionnaires** were distributed to respondents in the selected institutions. Of these, **348 valid questionnaires** were retrieved and analysed, representing a **96.4% response rate**, which was considered adequate for statistical analysis.

Table 2: Distribution of Respondents by Respondent Category

Categories	Frequency	Percentage (%)
LIS Lecturer	13	3.7
Librarians	21	6.0
LIS Students	314	90.3
Total	348	100

The respondents comprised 187 males (53.7%) and 161 females (46.3%), indicating balanced gender representation. By category, 314 (90.3%) were LIS students, 21 (6.0%) were librarians, and 13 (3.7%) were LIS lecturers.

Research Question 1: To what extent has AI been adopted for library assessment in LIS education in South-west Nigeria?

Table 3: Extent of Artificial Intelligence Adoption in Library Assessment Practices.

S/N	AI Application	Mean	SD	Decision
1.	Automated cataloguing system	3.42	0.71	Agreed
2.	AI-based plagiarism	3.61	0.65	Agreed
3.	Chatbots	2.94	0.88	Agreed
4.	AI-supported user analytics	2.87	0.92	Agreed
5.	Machine learning for information retrieval	2.70	0.96	Agreed
6.	Predictive data analysis system	2.51	1.01	Agreed
Grand Mean		3.01		Agreed

Decision rule: Mean ≥ 2.50 = Agreed; Mean < 2.50 = Disagreed.

Table 3 indicates a moderate level of AI adoption in library assessment (Grand Mean = 3.01). AI-based plagiarism detection (M = 3.61) and automated cataloguing systems (M = 3.42) recorded the highest levels of adoption, while predictive data analysis systems recorded the lowest mean (M = 2.51), although still above the acceptance criterion.

Research Question 2: Which AI tools are commonly used for library assessment in LIS education?

Table 4: AI Tools Commonly Used for Library Assessment in LIS Education.

S/N	AI Tools	Mean	SD	Decision
1.	Turnitin	3.72	0.84	Agreed
2.	Grammarly AI	3.60	0.94	Agreed
3.	AI-powered OPAC system	2.97	1.50	Agreed
4.	Chatbots	2.60	1.50	Agreed
5.	Data analytics software	2.34	1.50	Agreed
6.	Machine learning software	2.22	1.48	Agreed
Grand Mean		2.91		Agreed

Decision rule: Mean ≥ 2.50 = Agreed; Mean < 2.50 = Disagreed.

As shown in Table 4, Turnitin (M = 3.72) and Grammarly AI (M = 3.60) were the most commonly used AI tools. AI-powered OPAC systems and chatbots were also utilized, whereas data analytics software and machine learning applications recorded mean scores below the acceptance level. The overall grand mean (2.91) indicates moderate utilization of AI tools for library assessment.

Research Question 3: What are the perceived benefits of AI in the assessment of libraries?

Table 5: Perceived Benefits of AI in Library Assessment

S/N	Benefits of AI	Mean	SD	Decision
1.	Improves assessment accuracy	3.68	0.58	Agreed
2.	Saves time in library operation	3.47	0.55	Agreed
3.	Enhances information retrieval	3.59	0.62	Agreed
4.	Reduces manual workload	3.63	0.60	Agreed
5.	Supports efficient service delivery	3.56	0.66	Agreed
6.	Improves user satisfaction	3.41	0.72	Agreed
Grand Mean		3.60		Agreed

Decision rule: Mean ≥ 2.50 = Agreed; Mean < 2.50 = Disagreed.

Table 5 reveals that respondents perceived AI as beneficial for improving library assessment (Grand Mean = 3.60). Respondents agreed that AI enhances assessment accuracy, reduces manual workload, improves information retrieval, supports efficient service delivery, saves time, and increases user satisfaction.

Research Question 4: What are the challenges affecting the adoption of AI in library assessment in LIS education?

Table 6: Challenges Affecting the AI Adoption in Library Assessment

S/N	Challenges	Mean	SD	Decision
1.	Inadequate ICT infrastructure	3.76	0.49	Agreed
2.	Poor internet connectivity	3.69	0.57	Agreed
3.	Inadequate funding	3.72	0.51	Agreed
4.	Lack of technical expertise	3.55	0.65	Agreed
5.	Resistance to technical change	3.11	0.84	Agreed
6.	Inadequate power supply	3.80	0.46	Agreed
Grand Mean		3.61		Agreed

Decision rule: Mean ≥ 2.50 = **Agreed**; Mean < 2.50 = **Disagreed**.

The findings in **Table 6** show that inadequate power supply, poor ICT infrastructure, inadequate funding, poor internet connectivity, lack of technical expertise, and resistance to technological change constitute major barriers to AI adoption in library assessment (**Grand Mean = 3.61**).

Discussion of Findings

Extent of AI Adoption in Library Assessment

The study found a **moderate level of AI adoption** in library assessment among the selected higher institutions. AI applications such as plagiarism detection software, automated cataloguing systems, AI-supported Online Public Access Catalogues (OPACs), and chatbots were already in use, suggesting that institutions have begun integrating AI into teaching, learning, and library operations.

However, the relatively lower adoption of advanced technologies, including predictive analytics and machine learning, indicates that AI implementation remains at an early stage.

This finding aligns with Achugbue (2025), who reported that Nigerian academic libraries are gradually adopting AI to improve information organization, user services, and operational efficiency. Similarly, Odigie (2024) observed that although awareness of AI technologies among librarians is increasing, institutional implementation remains limited because of infrastructural and organizational constraints. The finding also supports Cox and Mazumdar (2024), who argued that AI adoption in academic libraries is progressing incrementally as institutions strengthen their digital infrastructure and professional capacity.

The moderate adoption level observed in this study suggests that while institutions recognize the value of AI, successful implementation requires sustained investment in infrastructure, digital competencies, and institutional support.

AI Tools Used for Library Assessment

The findings revealed that plagiarism detection software, Grammarly AI, automated cataloguing systems, AI-powered OPACs, and chatbots were the most commonly used AI applications. These technologies assist librarians and educators by improving information retrieval, automating routine processes, supporting academic integrity, and enhancing user interactions. Conversely, more sophisticated AI applications such as predictive analytics and machine learning were less frequently utilized, reflecting the technological and financial limitations experienced by many institutions.

These findings are consistent with Hooda et al. (2022), who emphasized that AI enhances assessment by automating repetitive tasks, improving feedback quality, and supporting evidence-based educational decision-making. Likewise, Cox (2023) observed that AI

applications in academic libraries are increasingly focused on service automation, digital resource management, and intelligent user support. The limited adoption of advanced AI tools, however, underscores the need for increased investment in emerging technologies and staff capacity development.

Benefits of AI in Library Assessment

Respondents generally perceived AI as beneficial for improving library assessment. The findings indicate that AI enhances assessment accuracy, reduces manual workload, facilitates timely feedback, improves information retrieval, supports efficient library services, and strengthens institutional decision-making. These perceived benefits demonstrate AI's capacity to improve both educational assessment and library service delivery.

The findings corroborate the work of Swiecki et al. (2022), who found that AI-supported assessment improves grading consistency, learning analytics, and personalized feedback. Similarly, Kasneci et al. (2023) argued that AI technologies enable educators and librarians to analyse large volumes of educational data more efficiently, thereby supporting evidence-based teaching and learning. These findings also reinforce Oakleaf's (2010) evidence-based assessment framework, which emphasizes the systematic use of assessment data to improve library effectiveness and demonstrate institutional value.

Overall, the results suggest that AI has significant potential to modernize assessment practices within LIS education by increasing efficiency, supporting data-driven decision-making, and improving the quality of library services.

Challenges Affecting AI Adoption

Despite the positive perception of AI, respondents identified several barriers limiting its effective implementation. The major challenges included inadequate ICT infrastructure, unstable electricity supply, insufficient funding, poor internet connectivity, limited technical expertise, inadequate training opportunities, and the absence of

institutional AI policies. These constraints continue to impede the widespread adoption of AI technologies in Nigerian higher education.

These findings are consistent with Issa et al. (2020), who identified infrastructural deficiencies and inadequate investment as major obstacles to digital transformation in Nigerian academic libraries. Similarly, Ademola-Popoola and Adesina (2024) emphasized that sustainable AI implementation depends on adequate funding, institutional commitment, and continuous professional development. The findings also support Dwivedi et al. (2023), who argued that responsible AI adoption requires effective governance frameworks addressing ethical issues such as transparency, accountability, data privacy, and algorithmic bias.

The persistence of these challenges suggests that technological investment alone is insufficient. Successful AI implementation also requires institutional leadership, strategic policy development, workforce capacity building, and sustained financial commitment.

Conclusion

This study examined the application of Artificial Intelligence in library assessment within Library and Information Science education in selected higher institutions in South-West Nigeria. The findings indicate that AI adoption is progressing at a moderate level, with institutions increasingly utilizing plagiarism detection software, automated cataloguing systems, AI-powered OPACs, chatbots, and related technologies to support assessment and library operations. Respondents acknowledged that AI improves assessment accuracy, enhances operational efficiency, reduces manual workload, and facilitates evidence-based decision-making.

However, the study also identified significant barriers to effective AI implementation, including inadequate ICT infrastructure, unstable electricity supply, insufficient funding, poor internet connectivity, limited technical expertise, and weak institutional policy

frameworks. These challenges constrain the adoption of more advanced AI technologies and limit the realization of AI's full potential in LIS education.

The study concludes that the successful integration of AI into library assessment requires coordinated institutional investment in digital infrastructure, human capacity development, governance frameworks, and supportive policies. Strengthening these areas will enhance assessment practices, improve library services, and better prepare LIS graduates for technology-driven information environments.

Recommendations

Based on the findings, the following recommendations are proposed:

1. **Strengthen Digital Infrastructure:** Higher institutions should invest in reliable ICT infrastructure, stable internet connectivity, uninterrupted electricity supply, and modern AI-enabled library systems to facilitate effective library assessment.
2. **Build AI Competencies:** Universities should provide continuous professional development programmes on AI, machine learning, learning analytics, and intelligent information management for librarians, LIS lecturers, and students.
3. **Increase Institutional Funding:** Governments, university management, and development partners should allocate dedicated funding for acquiring, maintaining, and upgrading AI technologies required for library assessment and digital library services.
4. **Develop AI Governance Frameworks:** Institutions should establish comprehensive policies and ethical guidelines addressing data privacy, transparency, accountability, academic integrity, and the responsible use of AI in library assessment and higher education.

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