

INTEGRATION OF ARTIFICIAL INTELLIGENCE IN TEACHING AND LEARNING OF LIBRARY AND INFORMATION SCIENCE IN UNIVERSITIES

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Abstract

Artificial Intelligence (AI) has emerged as one of the most disruptive technologies shaping contemporary higher education. Its influence extends across teaching, learning, research, and professional practice, redefining how knowledge is produced, accessed, and disseminated. This paper is an opinion- and literature-based study that critically examines the integration of AI in the teaching and learning of Library and Information Science (LIS) in universities. The paper discusses the conceptual and theoretical foundations of AI in education, explores key areas of application in LIS teaching and learning, and highlights the benefits of AI integration for students, educators, and the LIS profession. It further analyses the implications of AI for LIS education and practice, identifies major challenges confronting effective integration, and proposes strategies for sustainable adoption. Drawing extensively on recent African and global literature, the paper argues that AI has the potential to enhance instructional delivery, learner engagement, research productivity, and graduate employability when deliberately embedded within LIS curricula. However, infrastructural limitations, inadequate faculty capacity, ethical concerns, and weak policy frameworks continue to hinder optimal adoption in many universities. The paper concludes that coordinated policy development, curriculum reform, capacity building, and sustained investment are essential for leveraging AI to reposition LIS education in universities for relevance in the digital age.

Keywords: Artificial Intelligence, Library and Information Science, Teaching and Learning, Higher Education, Universities

Introduction

The rapid advancement of digital technologies has significantly transformed higher education systems worldwide. Among these technologies, Artificial Intelligence (AI) stands out as a powerful driver of innovation, reshaping pedagogical practices, research methodologies, and professional competencies. Universities are increasingly deploying AI-driven tools to personalise learning experiences, automate academic processes, and improve decision-making through data analytics. In this evolving landscape, academic disciplines that are closely linked to information management, such as Library and Information Science (LIS), are particularly affected.

Library and Information Science is fundamentally concerned with the organisation, retrieval, dissemination, and ethical use of information. Traditionally, LIS education has focused on cataloguing, classification, reference services, collection development, and user education. However, the exponential growth of digital information and the emergence of intelligent systems have altered the nature of information work. Contemporary libraries now rely on AI-powered discovery tools, recommender systems, automated indexing, chatbots, and data analytics to deliver efficient and user-centred services (Bello & Abdulsalam, 2023). Consequently, LIS education in universities must evolve to reflect these realities.

The integration of AI into teaching and learning is largely motivated by the need to align university education with the demands of a digital, data-driven, and knowledge-based

economy. Yakubu (2024) observes that technology-enhanced learning supported by AI promotes flexibility, inclusiveness, and innovation, especially in developing contexts where rigid pedagogical models persist. Similarly, Nna-Kue and Wagbara (2024) contend that AI applications such as intelligent tutoring systems, natural language processing tools, and learning analytics are redefining academic practice in African universities. Despite the growing global discourse on AI in education, the incorporation of AI into LIS education remains uneven and largely conceptual in many universities.

In several LIS schools, AI is discussed theoretically without being systematically embedded in curriculum design, instructional delivery, or student assessment. This paper therefore presents a critical, literature-based discussion on the integration of AI in the teaching and learning of LIS in universities. It examines conceptual and theoretical issues, areas of application, benefits, implications, challenges, and strategies for sustainable integration, with the aim of contributing to scholarly debate on the future of LIS education in the age of artificial intelligence.

Conceptual Clarification of Artificial Intelligence

Artificial Intelligence is commonly defined as the ability of machines or computer systems to perform tasks that normally require human intelligence, such as learning, reasoning, problem-solving, perception, and language understanding. In educational contexts, AI encompasses a wide range of technologies, including machine learning algorithms, expert sy

stems, neural networks, robotics, natural language processing, and predictive analytics (Russell & Norvig, 2021). In the context of LIS, AI refers to the application of intelligent systems to support information organisation, retrieval, analysis, and user services. Examples include automated cataloguing systems, intelligent search engines, virtual reference assistants, plagiarism detection software, and data mining tools used for collection development and user behaviour analysis (Omeluzor & Ojukwu, 2025).

These technologies extend the traditional functions of libraries and demand new competencies from LIS professionals. It is important to distinguish AI from related concepts such as automation and information and communication technology (ICT). While ICT focuses on the use of digital tools for information processing and communication, AI goes further by enabling systems to learn from data, adapt to user behaviour, and make autonomous decisions. This distinction underscores the transformative potential of AI for LIS education and practice.

Theoretical Framework

This paper is anchored on technological determinism and constructivist learning theory as complementary frameworks for understanding AI integration in LIS education. Technological determinism posits that technological innovation is a primary driver of social and institutional change. From this perspective, the emergence of AI inevitably reshapes educational practices, professional roles, and organisational structures. The increasing reliance on

intelligent systems in libraries suggests that LIS education must adapt or risk obsolescence (Suleiman, Okoro, & Udechukwu, 2024). Constructivist learning theory, on the other hand, emphasises active learner participation, knowledge construction, and experiential learning.

Learning is viewed as a process in which learners actively construct meaning through interaction with their environment. AI-powered learning environments align with constructivist principles by enabling personalised learning pathways, immediate feedback, and interactive simulations (Abba, 2025). When integrated into LIS education, AI supports learner-centred pedagogy by allowing students to explore real-world information problems using intelligent tools. The combination of technological determinism and constructivism provides a robust framework for analysing AI integration in LIS education. While technological determinism explains why AI adoption is inevitable, constructivism explains how AI can be used to enhance meaningful learning rather than merely automate instruction.

Integration of Artificial Intelligence in LIS Teaching

The application of AI in LIS teaching is gradually redefining instructional practices in universities. One major area of application is instructional design and delivery. AI-powered learning management systems can analyse student performance data to recommend appropriate learning materials and instructional strategies. According to Holmes, Bialik, and Fadel (2019), adaptive learning systems improve learning outcomes by tailoring instruction to individual learner needs.

In LIS education, lecturers can use AI tools to automate routine academic tasks such as grading objective tests, managing course content, and monitoring student engagement. Tools such as Turnitin, Grammarly, and learning analytics dashboards enhance feedback quality, promote academic integrity, and free lecturers to focus on higher-order cognitive tasks (Bello & Abdulsalam, 2023). AI also supports blended and online learning models, which have become increasingly important in the post-pandemic university environment. Another significant application of AI in LIS teaching is the use of virtual teaching assistants and chatbots. These tools provide real-time responses to students' queries, guide learners through course materials, and support self-directed learning. Suleiman et al. (2024) note that AI-driven instructional support systems enhance interaction and reduce delays associated with traditional lecturer-centred communication.

Artificial Intelligence in Learning Library and Information Science

From the learners' perspective, AI technologies offer personalised, flexible, and interactive learning experiences. LIS students can use intelligent search engines, recommender systems, and automated summarisation tools to access and process vast amounts of information efficiently. Studies have shown that students increasingly rely on AI-driven tools for literature searching, reference management, and research writing (Owolabi, Adeyemi, & Lawal, 2022). AI also enhances experiential learning through simulations, virtual libraries, and augmented reality environments. These technologies allow students to practice cataloguing

, classification, digital archiving, and reference services in simulated settings that mirror real-world library operations.

Fabunmi and Akinyemi (2025) argue that such immersive learning environments bridge the gap between theory and practice in LIS education. Furthermore, AI-supported learning environments promote the development of critical digital literacy. Students learn not only how to use intelligent systems but also how to evaluate their outputs, recognise algorithmic bias, and understand ethical implications. This holistic approach to AI literacy is essential for preparing LIS graduates to function responsibly in technology-driven information ecosystems.

Benefits of Integrating Artificial Intelligence in LIS Education

The integration of AI into LIS education offers numerous pedagogical, professional, and institutional benefits. One major benefit is enhanced teaching effectiveness. AI supports adaptive learning, automated assessment, and interactive content delivery, thereby improving instructional quality and learning outcomes (Holmes et al., 2019). Another significant benefit is improved learner engagement. Personalised learning pathways, immediate feedback, and interactive simulations motivate students and accommodate diverse learning styles. AI also enhances research skills by facilitating efficient information retrieval, citation analysis, and data visualisation. For LIS students, these capabilities are particularly valuable given the research-intensive nature of the discipline.

AI integration also improves graduate employability. The LIS profession increasingly demands competencies in data analytics, digital curation, and human-computer interaction. Exposure to AI during university education equips students with relevant skills and positions them for emerging roles in academic, public, and special libraries, as well as in non-traditional information environments (Abba, 2025). At the institutional level, AI promotes innovation and interdisciplinary collaboration. LIS schools that integrate AI can collaborate with computer science, information technology, and data science departments, thereby expanding research opportunities and enhancing institutional visibility.

Implications of AI Integration for LIS Education and Practice

The integration of AI into LIS education has far-reaching implications for educators, students, and the profession. For educators, AI necessitates a shift from traditional lecturer-centred pedagogy to facilitative and mentorship-oriented roles. Educators must develop competencies in digital pedagogy, data interpretation, and ethical supervision of AI-assisted learning (Suleiman et al., 2024). For students, AI integration implies the acquisition of hybrid competencies that combine traditional librarianship skills with technological and analytical expertise. Graduates must be able to manage intelligent systems while upholding core professional values such as intellectual freedom, privacy, and equity.

Professionally, AI is redefining library services and workflows. Intelligent systems are increasingly used for collection development, user services, and research support. LIS ed

education must therefore prepare graduates to work effectively in AI-enhanced library environments and to participate in policy discussions on ethical AI use in information services.

Challenges of Integrating Artificial Intelligence in LIS Education

Despite its benefits, the integration of AI into LIS education faces several challenges. Infrastructural limitations, including inadequate internet connectivity, unreliable power supply, and limited access to computing facilities, constrain effective implementation in many universities. Financial constraints further limit the acquisition and maintenance of AI technologies. Human capacity challenges are also significant. Many LIS educators lack adequate training in AI applications and digital pedagogy, leading to resistance and anxiety regarding technology adoption (Orubebe, Braide, & Oladokun, 2024). Ethical concerns related to data privacy, algorithmic bias, and academic integrity further complicate AI adoption in educational contexts.

In addition, weak institutional policies and limited national frameworks for AI in education result in fragmented and inconsistent implementation across universities. Without clear guidelines, AI integration efforts remain ad hoc and unsustainable.

Strategies for Sustainable Integration of Artificial Intelligence in LIS Education

Sustainable integration of AI in LIS education requires a comprehensive and coordinated approach. Universities should develop clear institutional policies that define objectives, ethical standards, and implementation strategies for AI use in teaching and learning. Curr

riculum reform is essential to incorporate AI-related courses such as data analytics, machine learning fundamentals, and digital ethics. Capacity building should be prioritised through continuous professional development programmes for LIS educators. Workshops, online certifications, and collaborative training initiatives can enhance digital competence and confidence.

Strategic partnerships with technology firms, professional associations, and international organisations can provide technical support and funding opportunities. Adequate investment in digital infrastructure, including reliable internet connectivity and access to cloud-based AI tools, is critical. Regular evaluation and monitoring of AI initiatives will also ensure alignment with institutional goals and evolving technological standards.

Conclusion

Artificial Intelligence represents a transformative force in the teaching and learning of Library and Information Science in universities. When thoughtfully integrated, AI enhances instructional quality, learner engagement, research productivity, and graduate employability. However, realising these benefits requires addressing infrastructural, human capacity, ethical, and policy challenges. This paper concludes that AI integration in LIS education is both inevitable and necessary for the future of the profession. Universities must therefore adopt deliberate, inclusive, and ethically grounded strategies to embed AI into LIS curricula and pedagogy. Through sustained institutional commitment, curriculum innovation, and stra

tegic investment, LIS education can be repositioned as a forward-looking discipline capable of addressing contemporary and future information challenges.

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