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Artificial Intelligence Literacy, Digital Literacy, and Information Fluency in Academic Libraries in Nigeria: A Review

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Abstract

This study reviewed artificial intelligence (AI) literacy, digital literacy and information fluency in Nigerian academic libraries. The study made clear that one must look at how information technologies are evolving and impacting society in order to understand the significance of artificial intelligence digital literacy and information fluency in Nigerian academic libraries. Understanding how artificial intelligence systems work their applications and their effects on society is a prerequisite for AI literacy. Knowing the basics of artificial intelligence such as machine learning, neural networks, natural language processing and robotics is part of this literacy. To successfully navigate the digital world one needs a broad range of skills including digital literacy. Managing digital tools understanding and using digital data communicating online and maintaining ones safety in the digital world are all part of this. Evaluating and using information in an ethical manner are all parts of information fluency. The study pointed out that implementing literacy programmes in academic libraries presents a number of difficulties including inadequate information and communication technology infrastructures, ineffective online access and a lack of comprehensive digital skills and information searching abilities among library staff members and users are some of the factors that prevent academic librarians from using their digital literacy abilities effectively in their work. The study recommended that academic library management should stay in touch with local organizations, policymakers, faculties and educational departments to highlight the importance of AI, digital and information literacy programmes for efficient 21st-century information service delivery.

Keywords: Artificial intelligence, Digital Literacy, Information fluency, Academic Libraries, Nigeria

Introduction

Academic libraries are evolving into centers of technological advancement and information sharing. The way academic libraries retrieve organize and distribute information has been altered by artificial intelligence (AI) tools and digital platforms. Because of this, librarians are having a hard time keeping up with these changes while still using technology to improve their services. The development of information literacy skills for library employees and patrons alike must be given top priority in this case. Libraries can empower people by giving employees and patrons the skills they need to effectively interact with information sources and make informed decisions in the rapidly changing digital world. (Ajani *et al*., 2022).

Every human task has involved technology and the establishment of the internet and information and communication technology (ICT) has significantly altered the libraries traditional role as a location for the presentation and storage of information sources. In this information age academic libraries have a responsibility to gather preserve and share information from any source with their patrons. Academic libraries in Africa and Nigeria specifically have begun incorporating technology into their operations (Oni *et al*., 2018). The use of AI in academic libraries has opened up promising possibilities. The use of microelectronic technologies for information processing management collection retrieval and utilization is becoming more and more important worldwide. The way academic libraries operate and think has been completely transformed by artificial intelligence. These days' academic libraries are forced to embrace technology. Academic libraries have used AI in a variety of ways from distribution to book sorting (Afolayan *et al*., 2020).

In the twenty-first century academic libraries play a crucial role in bridging the gap between information and technology. Academic libraries are now more than just locations for books they are thriving hubs where people can acquire critical skills necessary to succeed in the complicated information landscape of today. Among these skills information fluency digital literacy and AI literacy have become crucial. Making informed decisions using technology efficiently and contributing to scholarly and public discussions are all made possible by these abilities. Literacy has always been a high priority for library services. Academic libraries must meet a variety of literacy needs in the modern world including information fluency digital literacy AI comprehension and traditional reading skills (Spencer 2024). These skills are essential for enabling people to effectively search assess and utilize information in a digital environment.

The abilities required to handle digital data communicate online and use digital tools efficiently are all part of digital literacy. This covers internet navigation retrieving content from the internet and basic computer skills. As for access one well-established field in library science is information literacy (or more recently information fluency) which focuses on assisting people in locating evaluating interpreting and using information from library resources. The ability to locate evaluate and apply information effectively is referred to as information fluency. It involves utilizing critical thinking and problem-solving skills when looking for and utilizing information. For academic research information fluency is essential because it enables users and librarians to assess sources synthesize data and produce scholarly content. Examining how information technologies are evolving and impacting society is crucial to understanding the significance of artificial intelligence (AI), digital literacy and information fluency academic libraries (Baker, 2013).

Concept of Artificial Intelligence (AI) Literacy

In 1956 the science and engineering of making intelligent machines was the original definition of artificial intelligence (AI) . Over the course of the 20th century artificial intelligence (AI) has developed into increasingly intelligent machines and algorithms that can reason and adapt in response to environments and sets of rules that resemble human intelligence (McCarthy 2007). The term artificial intelligence (AI) was expanded by Wang (2019) to include the ability to perform cognitive tasks specifically learning and problem-solving using cutting-edge technological advancements like machine learning natural language processing and neural networks.

Although the vast majority of people are aware that AI services and devices exist they rarely understand the underlying ideas and technology or the potential ethical concerns associated with AI (Ghallab, 2019). Understanding AIs fundamentals uses and ethical issues is the focus of AI literacy a subset of digital literacy. Effective use of AI tools is only one aspect of it other skills include critically assessing their results comprehending their underlying mechanisms and considering the ethical and societal ramifications. Computer specialists are not the only ones who need to be literate. Many current trends and issues highlight the importance of AI literacy in academic libraries. At the same time a number of ethical and privacy issues are emerging due to the quick spread of AI necessitating careful management (Cox, 2022). As AI becomes more prevalent in academic libraries, it is becoming more widely acknowledged that cultivating

AI literacy is essential to enabling library staff, faculty members and students to take advantage of AIs potential while reducing its risks (Ng *et al*., 2021).

According to Ridley and Pawlick-Potts (2021), algorithmic literacy is the ability to understand algorithms and their effects recognize their applications assess their effects and portray people as active contributors to algorithmic decision-making as opposed to passive victims. They contend that algorithmic literacy can be advanced by encouraging explainable AI libraries and integrating algorithmic literacy into information literacy training. AI literacy requires an understanding of and ability to use artificial intelligence concepts. Understanding machine learning data privacy algorithms and the ethical ramifications of AI technologies are all necessary. The increasing use of AI in many aspects of life and work necessitates that both students and librarians understand and make use of AI tools.

AI Application for Academic Library Services Delivery

In this information age academic libraries should reposition themselves to better utilize the potential of artificial intelligence by improving the caliber of library services (Tella, 2020). Like their counterparts in developed nations universities in Nigeria may combine traditional and online teaching approaches. Artificial intelligence and libraries can work together to significantly advance the future of libraries. AI offers more efficient methods to enhance services like research exploration and recovery. Human skills can be enhanced and improved by intelligent information systems. Artificial intelligence can be used by library staff in every facet of providing users with information resources and services. AI will be able to analyze collections and store and send content quickly across a range of platforms. It will foster closer ties between information technology stakeholders and library professionals leading to the development of collaborative technology (Atayero, 2020).

Successful AI implementations can serve as a springboard for the uptake of these cutting-edge technologies and enhance the services and information resources that librarians offer. The following are some examples of artificial intelligence tools and areas in which they can be used in libraries: robotics (taking inventory shelving searching and retrieving information materials from shelves check-in and check-out) chatbots (acquisition descriptive cataloguing query services library instructions and information retrieval) natural language processing (NLP) (knowledge management book/information processing classification of books translation of text from native language reading of information materials as well as information retrieval)

pattern recognition (library material security QR code of materials image indexing and abstracting user identification RFID and security passwords) image processing (archival preservation and archival managing library image and video databases records scanning and user facial recognition) text data mining (citation support and analysis OPAC searching metadata reference services social media appearance and management and Library Trends). Applications of AI in librarianship are unavoidable a library problem can be resolved by utilizing two or more AI techniques which are utilized in many areas of life and academia (Ajakaye, 2023).

Concept of Digital Literacy in Academic Libraries

Digital literacy includes a wide range of abilities needed to successfully navigate the digital world. This covers the skills necessary to operate digital devices comprehend and handle digital data interact online and maintain safety in a digital setting. Digital literacy includes the capacity to communicate and work together online comprehend digital content and use digital tools and platforms efficiently. The ALA defines digital literacy as the ability to use information and communication technologies to find understand evaluate create and communicate information requiring both cognitive and technical skills (Digital Literacy Taskforce, 2011).

The services that academic libraries offer have been totally transformed by digital technology. Due to these technological advancements academic libraries in developing nations are attempting to adapt their services to the new realities of providing library services. The rise of digital technology has put a lot of pressure on librarians to meet the needs of tech-savvy patrons. In the current era academic librarians must possess a certain level of digital proficiency in order to fulfill user demands and carry out their duties efficiently. For librarians to meet the demands of digital librarianship and stay up to date with the rapid evolution of academic libraries in this digital age, they must possess digital competency (Khan & Bhatti 2017).

Digital competencies are the skills necessary for librarians to perform effectively in computerized library environments. These skills encompass the ability to communicate and participate in cooperative networks through the Internet as well as the use of computers and other technological tools to locate evaluate use store create and share information. When working in a digital library the librarian can be productive. Among the fundamental digital literacy skills that librarians in the twenty-first century need to have are basic computer skills, internet navigation, information literacy, media literacy, communication skills, copyright and

intellectual property, data literacy, and privacy and security awareness (European Union, 2018).

Stages of Digital Literacy Evolution

Digital competence digital usage and digital transformation are the three phases of digital literacy. According to Ala-Mutka (2011), these levels outline the necessity for all librarians to possess general digital competency in addition to honing their own digital usage for work-related and other particular objectives.

Information Fluency

Information fluency is a set of skills that people need to be able to identify when they need information and find assess and use that information efficiently. Additionally, information fluency is becoming more and more crucial in the modern world of rapidly evolving technology and an abundance of information sources. However, more and more information is reaching people in unfiltered formats which raise concerns about its validity authenticity and dependability. Information is also accessible through a variety of media such as text audio and graphics which present additional difficulties for people in assessing and comprehending it. The growing amount and ambiguous quality of information present significant problems for society. Without the complementary set of skills required to use information effectively the sheer volume of information will not by itself produce a more informed populace (University of North Texas 2025).

Proficiency in information is essential for academic library success because it allows for in-depth research critical evaluation of sources and ethical presentation of findings. To teach information fluency academic libraries can use techniques like information literacy classes embedded librarianship and one-on-one research consultations. Information fluency can be taught in academic libraries through a variety of methods such as interactive exercises resource guides and instructional sessions. The foundation of lifelong learning is information fluency. Every discipline learning setting and educational level shares it. It makes it possible for students to become more self-directed take charge of their own education and master material and expand their investigations. Recognize the social legal and economic concerns related to information use and access and utilize information in a morally and legally responsible manner (University of North Texas 2025).

According to University of North Texas (2025), an information fluent individual is able to:

- Assess the level of information required.
- Obtain the required information quickly and effectively.
- Analyze information critically including its sources.
- Add a few chosen facts to one's knowledge base.
- Effectively use information to achieve a particular goal.

AI Literacy, Digital Literacy, and Information Fluency

AI literacy, digital literacy, and information fluency are interconnected and mutually reinforcing. The integration of these literacies can create a comprehensive educational framework that prepares librarians for the complexities of the digital age. AI literacy, digital literacy, and information fluency intersect in areas such as data literacy, where understanding AI tools enhances digital literacy, and ethical use of information intersects with both AI and digital literacies (Smith & Garcia, 2022). Smith and Garcia, (2022) further highlights the relationship between AI literacy, digital literacy, and information fluency as follows: Understanding AI and information fluency in this 21st Century require foundational digital literacy skills, such as using digital tools in navigating online information. Digital literacy skills enhance the ability to seek, evaluate, and use digital information effectively.

Strategies for Promoting AI, Digital and Information Literacy

A comprehensive approach to information education should be provided by academic libraries through the development of integrated literacy programmes that cover all three literacies. Academic libraries are able to create all-encompassing literacy programmes that incorporate information fluency digital literacy and AI literacy. Academic libraries can provide resources and programmes that help users become more confident when interacting with these technologies by demythologizing digital literacy information fluency and AI literacy.
AI literacy, digital literacy, and information fluency can be promoted as follows:

Training and Retraining Sessions: regular training sessions through seminars, conferences and workshops covering topics like information fluency, digital literacy and artificial intelligence. Providing librarians with the skills resources and abilities they need to carry out their jobs well adjust to new technologies and procedures and favourably impact the development and growth of academic libraries requires training programmes (Gupta 2025).

Online tutorials and guides: Produce a number of instructional videos tutorials and guides that users can view whenever it's convenient for them. A range of digital literacy skills including artificial intelligence should be covered in these materials along with thorough step-by-step instructions for using various digital tools and resources. When users come across complicated tasks an online tutorial is a type of tutorial document that offers them real-time guidance step-by-step instructions and support through technological delivery methods (Science Direct, 2025).

Tailored Assistance: Help people who want to become more digitally literate by offering them individualized support and advice. These could include chat support, virtual reference services and one-on-one conversations with librarians. Encourage the development of digital content that is accessible and increase awareness of the difficulties associated with digital accessibility. To guarantee that all users can efficiently access and profit from digital materials provide advice on creating accessible documents websites and multimedia resources.

Curriculum Integration:

Work together with academics to incorporate instruction in digital literacy into the curriculum. Educators and librarians can collaborate to create tasks and exercises that promote critical analysis of online content and improve digital literacy. Enhancing users' engagement in a rapidly changing digital world has become possible through the incorporation of AI, digital literacy and information fluency into educational curricula (Mawardi *et al*., 2024).

Assessment and Evaluation: Gather user feedback administers surveys and examine usage data to continuously evaluate the efficacy of AI, digital literacy and information fluency. Since digital literacy is crucial in today's fast-paced technologically advanced world for one's education career and even daily life digital literacy assessments are an important part of contemporary workforce development and educational programmes. Digital literacy is an essential skill for everyone to possess in today's world which is becoming more and more reliant on technology. Digital literacy tests are valuable instruments for determining where people need to improve and how well they can navigate the digital world.

Benefits of AI Literacy, Digital Literacy, and Information Fluency in Academic Libraries

Some benefits of AI literacy, digital literacy, and information fluency in academic libraries according to Durcan (2011) and Cox, (2022) are:

- **Enhanced Learning**: Proficiency in using computers, digital devices, and AI-powered tools can tailor educational content to individual learning styles and needs. AI, digital and information literacy enable users and librarians to leverage AI and digital tools for enhanced information provision and utilisation which may impact learning and research outcomes in the academic environment. Skills to create and share digital content, such as blogs, videos, and social media posts. Improves the ability to find and use high-quality, credible sources.
- **Research Advancements**: Ability to find and evaluate information online. AI, digital and information literacy can assist in data analysis, pattern recognition, and predictive modelling, thereby accelerating research. AI, digital and information literacy prepare librarians and library users for future careers in a tech-driven world. Technology is transforming libraries and education by enabling personalised learning, and providing advanced data analytics. Develops skills to critically assess information and its sources online such library databases. Facilitates the synthesis of information to generate new insights and knowledge.

1. **Administrative Efficiency**: Automating routine tasks allows librarians and library administrators to focus on more critical activities.
2. **Ethical Awareness**: Understanding AI ethics helps users and librarians navigate the moral complexities of AI applications. Ethical awareness teaches how to protect personal information and avoid cyber threats. It also promotes ethical information use and proper citation practices.

Challenges in Implementing Literacy Programmes in Academic Libraries in Nigeria

AI and robotics integration in academic libraries may be hampered by a lack of expertise and the requirement for training before deployment according to Tait and Pierson (2022), limited adoption of AI and bots in library settings is partly due to a lack of knowledge about these technologies. In their examination of the obstacles to the adoption of AI in academic libraries Two main issues: the disruption of traditional library services brought about by AI which still astounds many library professionals and the lack of awareness among librarians regarding how to use AI to meet their service needs (Youssef *et al*., 2022).

Inadequate information and communication technology infrastructures, ineffective online access and a lack of comprehensive digital skills and information searching abilities among library staff members and users are some of the factors that prevent academic librarians from using their digital literacy abilities effectively in their work. Others include a lack of basic information literacy, frequent power outages, a poor internet network, a heavy workload in the office, a lack of time for librarians and insufficient digital skills among library staff members and users (Odu & Omosigho 2017; Emiri, 2015). Lack of awareness regarding AI and bots is the reason for the low adoption rate in libraries. Despite the enormous benefits of chatbots for enhancing reference services in libraries. Kaushal and Yadavs (2022) research on the use of chatbots in university libraries revealed that their primary disadvantage is a significant invasion of privacy which must be eliminated by software designers at the development stage.

Conclusion

In conclusion, AI literacy, digital literacy and information fluency are critical abilities for negotiating the intricate information environment of the twenty-first century. Academic libraries are essential for developing these literacies because they enabling environment to use digital technologies with assurance and responsibility. Academic libraries can remain essential hubs for learning and innovation by creating thorough literacy programmes, tackling obstacles and staying ahead of new trends. For academic libraries to stay at the forefront in information services delivery in the twenty-first century must be equip with digital and information literacies. This study urges academic librarians to embrace their responsibilities as leaders and teachers in literacy instruction encouraging a culture of digital fluency, and lifelong learning within their academic communities.

Recommendations

1. Library staff should be trained to stay updated on AI, digital technologies, and information fluency trends in order to effectively utilise emerging technologies in delivering library services.
2. The institution and academic libraries management should efficiently make use of available resources and seeking additional funding through grants and partnerships to enhance programme development.
3. Academic libraries management should engage with policymakers, local organisations, faculties and educational departments to highlight the importance of AI, digital and

information fluency programmes in the 21st Century for effective academic library services delivery.

4. To ensure the ongoing success of literacy programmes, academic libraries should adopt a culture of continuous improvement, regularly evaluating and updating their programmes.

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