

Professional Development and Use of Artificial Intelligence (Ai) by Librarians in Universities in Southwestern Nigeria

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Abstract

This article explores professional development and use of artificial intelligence by librarians in universities in Southwestern, Nigeria. The integration of AI into library services and operations is reshaping the role of librarians and the services they provide. The paper highlighted technical proficiency, user-oriented design, ethical awareness, programming, data management, using and managing big data AI literacy, and troubleshooting skills, as skills needed by librarians in university libraries in Nigeria to harness AI's potential fully. Therefore, training in the use of AI is essential for librarians to handle this transition. This study also offers a professional development roadmap that emphasises flexible training programs, workshops, certification programs and collaboration with technology firms, incorporation of Artificial Intelligence (AI) into library education, and continuous learning opportunities as strategies to develop librarians professionally. It is concluded that as libraries in Nigeria evolve into technologically advanced knowledge centers, librarians must acquire competencies that extend beyond traditional librarianship to include advanced ICT skills. It was therefore recommended that libraries should promote lifelong learning and AI use by offering continuous training programs, including

webinars, certification and ethics workshops, ensuring staff remain updated on emerging technologies and regulatory frameworks. Universities should also collaborate with other universities, technology experts and form consortia to share resources and collectively address AI-related challenges.

Keywords: Artificial Intelligence, Professional Development, Librarians, Universities

Introduction

Artificial Intelligence (AI) refers to the ability of machines to act similarly to human intelligence. According to Heath (2018), AI is a technology that allows machines to possess skills such as planning, learning, reasoning, problem-solving, movement, and a degree of creativity. AI represents another advancement that skillfully utilizes machines to perform tasks that humans can undertake, often at a quicker pace, such as analyzing vast amounts of data and making predictions (Wheatley and Hervieux, 2019). Artificial Intelligence is a transformative force that alters the intellectual, social, and professional realms of humanity; it represents more than just a technological trend (Redek, Marčič, Maldonado, Da Silva and Shenstone, 2023). The application of AI in libraries can be regarded as a set of methods that allow machines to perceive, comprehend, act, learn and perform administrative tasks, equipping libraries with advanced technologies. Consequently, AI has emerged as the latest trend for librarians and libraries.

Historically, librarians have been seen as custodians of information who ensure that knowledge is preserved, organised and accessible to all. However, with advancements in AI, the role of librarians could expand to include the curation of digital and AI-generated materials. To foster ethical usage of AI technologies and ensure accountability and transparency in their implementation, librarians will need to take proactive steps. Beyond helping users navigate the complex landscape of AI-driven resources, future librarians will also act as vigilant observers of the potential risks that these technologies may pose. The rise of AI and other innovative technologies is intricately connected to the future of librarianship in Nigeria.

Over the years, the profession of librarianship has undergone significant transformations. The role of librarians has evolved consistently, starting from the early days of manual book cataloging to the late 20th century when digital technologies came into play. We are now on the brink of yet another major shift with the introduction of AI into the core of library management and services. As the digital landscape continues to advance, AI technologies possess the ability to radically change how libraries operate, engage with users, organize information and offer services.

To remain relevant and effective in their roles, future librarians will need to acquire new skills and partake in specialized training and professional development within this ever-changing environment.

Professional development, according to Agbo, Odunlade, and Ojo (2021), refers to the process of gaining the knowledge, skills and attitudes necessary for employees to operate effectively and efficiently in order to meet organizational goals and objectives. The knowledge and skills acquired are intended to help librarians enhance their utilization of AI. Justifying the overall importance of professional development for librarians, Agada and Tofi (2020) argued that untrained librarians contribute little or nothing to the library's advancement, hindering its ability to achieve its goals and objectives. As a result, librarians may struggle to implement the latest technologies and tools, such as AI, for information delivery among other tasks. This suggests that the extent to which librarians can use AI in libraries is linked to the degree of training and development they receive.

In a future shaped by AI, librarians are encountering a pivotal moment within a swiftly changing profession. The incorporation of AI into library functions and services is transforming both the role of librarians and the offerings they provide. To flourish in this AI-centric age, librarians in Nigeria, similar to their counterparts worldwide, need to acquire new skills and knowledge. This will ensure that innovations driven by AI are advantageous to the wider community and reinforce libraries' status as vital organizations within the knowledge society. The library profession has the potential to thrive in the context of AI by preparing the upcoming generation of librarians in Nigeria with the necessary skills, knowledge, and mindset. This study, therefore, investigated the critical AI competencies needed and the professional development opportunities available for librarians in Nigeria to effectively adapt and succeed in an AI-enhanced landscape.

Literature Review

AI skills required by librarians.

As libraries adopt advanced technologies like artificial intelligence (AI), the skills required for librarians are evolving rapidly. Librarians now need a diverse set of new abilities that blend traditional library expertise with modern technological proficiency to effectively manage this transition to an AI-driven environment. As noted by Anthonia and Idiodi (2024) and Jan et al.

(2024), in addition to basic and intermediate ICT skills, librarians should also have advanced ICT competencies, including Natural Language Processing (NLP), Cloud computing, Machine Learning (ML), Big data analytics, algorithm design and programming to make the most of AI technologies.

Sarwari et al. (2023) also carried out a systematic review focusing on the vital skills necessary for the successful implementation of AI and its significant impact on human communication. The findings suggested that in order to thrive in the AI era and apply this advanced technology effectively, individuals must understand its significance, advantages, challenges, and acquire the essential skills. The study revealed that AI provides more innovative features and enhances connectivity, but this necessitates a range of skills, including a positive attitude towards AI technologies, language proficiency, technical knowledge, an understanding of the benefits and challenges associated with AI, effective prompting, collaboration and teamwork for successful AI application. For librarians, these results underscore the importance of building robust AI literacy and associated skills to successfully incorporate new technologies into library offerings. By fostering technical expertise, language skills, and a constructive approach to AI, librarians can boost information dissemination, enhance user interaction and adjust to changing digital landscapes.

Verma et al. (2022) also examined the skill requirements listed in job postings for positions in artificial intelligence and machine learning, revealing that AI jobs necessitate more generic skills such as communication, while machine learning roles prioritize technical abilities like data mining, programming, statistics and big data. The study also highlighted that expertise in data analysis, visualization and reporting is highly sought after in the field of AI. The findings suggested that these skills could be beneficial for the recruitment process and could also inform updates to current course offerings to meet the growing demands of the job market. Accordingly, David-West (2023) emphasized that integrating these skills into the librarians' toolkit equips them to manage the complexities associated with AI implementation in libraries, ensuring that AI-powered services are both efficient and centered around user needs while complying with ethical and data privacy standards. According to Mane (2025) and David-West (2023), some of the skills needed by librarians to thrive in this current AI-driven era includes:

Technical Proficiency

Technical expertise in the age of artificial intelligence is an essential component of librarian training, as it equips librarians to effectively navigate and oversee increasingly digital and automated information landscapes. This expertise encompasses a comprehensive understanding of AI principles, including machine learning, natural language processing and recommendation algorithms, which are now integrated within numerous library systems and discovery tools. It is imperative for librarians to possess data literacy, enabling them to analyze usage analytics, search behaviors, and patterns that guide collection development, user services and digital strategy.

Data Management Skills

Librarians with strong data management abilities can utilize AI tools to improve the discovery, analysis and curation of resources, resulting in information systems that are efficient, secure and easily accessible. In addition to basic data management, they can apply AI to automate the creation of metadata, enhance search accuracy and tailor user experiences. Their proficiency in handling large and intricate datasets allows librarians to maintain data accuracy, consistency and long-term preservation. Moreover, having a thorough understanding of data privacy laws and ethical implications is vital for preserving user trust and adhering to professional standards. This blend of technical skill and ethical insight positions librarians as key players in the creation of intelligent information ecosystems.

User-Oriented Design

The capability to create and execute user-friendly AI applications, alongside inclusive design principles and empathy-driven approaches, is essential for improving user experiences. This will ensure that the applications provide personalized, seamless and effective experiences that enhance engagement and promote lifelong learning across various library communities. Well-crafted interfaces that are user-friendly, efficient and pleasing can significantly influence a user's perception and interaction with AI. On the other hand, poorly designed interfaces can result in frustration, reduced productivity, and might even lead users to reject the technology altogether (Emma, 2024). The foundation of user-oriented interface design lies in the concept of usability which means developing interfaces that are logical, effective, and straightforward to navigate. Usability is a vital element in guaranteeing that users can interact with a system or application fluidly, without encountering frustration or confusion.

For librarians, the creation and deployment of AI applications that prioritize user-friendliness are essential for improving the accessibility and usability of library services. Librarians can guarantee that a variety of users, ranging from students to researchers, encounter smooth interactions with digital platforms by utilizing inclusive design principles. Thoughtfully designed AI interfaces allow librarians to offer customized services, enhance information retrieval, and promote user involvement. This reinforces the library's position as a supportive, user-centric space that fosters lifelong learning and adaptability to technology.

Trainings for Librarians

Training and ongoing professional development are vital for ensuring librarians possess the necessary skills to navigate the shift towards AI-driven technologies in libraries. Librarians must continually adapt to the swift advancements in AI, data management and digital tools to stay relevant. For both current and aspiring librarians, placing a strategic emphasis on AI literacy and the ethical use of AI is important. Furthermore, librarians should cultivate self-training abilities to stay informed about the evolving landscape of information technologies (Chiparausha et al., 2024). Typically, librarians acquire digital competencies through foundational education in library programs, ongoing professional development, or through initiatives of self-directed learning. To address and improve any existing weaknesses, it is advisable for librarians to regularly engage with social media tasks. Additionally, performing skills gap analyses within the research department can help pinpoint specific areas for improvement and aid in the selection of focused training programs.

AI Literacy

According to Long et al. (2021), AI literacy is defined as a collection of skills necessary to comprehend, utilize, supervise and critically assess AI applications. This concept of AI literacy emphasizes the essential skills that the general populace should have, primarily targeting learners who lack a background in computer science (“non-experts”). Scott-Branch et al. (2023) suggested that AI literacy comprises knowledge, skills and experiences related to understanding and employing AI, as well as a thorough examination of its drawbacks and a willingness to investigate unexplored areas of AI further. Understanding AI entails grasping its principles, uses, and ethical considerations. This encompasses not only the proficiency to effectively utilize AI tools but also

the ability to critically assess their outputs, comprehend their fundamental mechanisms, and reflect upon their ethical and societal effects (Lo, 2024).

A strong understanding of AI allows librarians to make informed decisions regarding the implementation of AI and to address the ethical concerns associated with AI technologies. Training programs should include the basics of AI and its uses in libraries, such as recommendation systems, automated cataloging, and personalized user services. Mane (2025) argued that in order to provide more efficient and user-friendly services, librarians need to be knowledgeable about AI tools like chatbots, virtual assistants and automated information retrieval systems. Acquiring this expertise places librarians in a better position to assist users who approach the library with inquiries about how to utilize AI in their own endeavors.

Ethical Consideration and Fairness Assurance

Given the ethical implications surrounding AI, Ogun (2022) argued that librarians must navigate these challenges when adopting AI-driven services. Librarians ought to be knowledgeable about the ethical standards related to AI, such as fairness, transparency, accountability, and privacy (David-West and Ig-Worlu, 2023). This knowledge aids in making ethical choices. Furthermore, librarians need to be able to detect bias in AI systems. If AI models are developed using datasets that don't accurately represent the diversity of the local community, they can perpetuate stereotypes or omit crucial cultural aspects. The patterns, predictions and suggested actions generated by AI depend on the quality and dependability of the datasets used for their training, in addition to the assumptions and biases of the algorithm developers (Schwartz et al., 2022). Librarians should be skilled in identifying biases within training data, algorithms and their results. Additionally, librarians require expertise in creating and implementing strategies to address bias and ensure fairness in AI systems. This could include retraining models, reassessing data sources or utilizing algorithms designed to correct bias.

Data privacy remains a critical issue for librarians utilizing AI technologies, as these systems frequently depend on extensive datasets that may include sensitive user information to operate efficiently. The gathering, storage, and handling of this data can pose serious risks to individual privacy if not handled appropriately. Rubin (2020) emphasized the necessity of strong data protection strategies to avert unauthorized access and the misuse of personal information within libraries that implement AI. AI systems are heavily dependent on large volumes of data, often containing sensitive details about library patrons, such as their reading preferences, research

topics, and personal details, making it crucial to maintain the confidentiality and security of this information. The European Union's General Data Protection Regulation (GDPR) establishes a high benchmark for data privacy, stressing the importance of transparency, user consent, and strict data protection measures. Librarians are obligated to comply with these regulations to build trust and acceptance among users. When patrons are assured that their data is being managed securely and ethically, they are more inclined to accept AI technologies (Rubin, 2020).

Librarians, as custodians of information and who advocates for equal access, face the challenge of balancing the use of technological advancements with the implementation of ethical practices in their services. The ethical implications of AI for librarians are interconnected matters that demand thorough contemplation and proactive strategies. Protecting data privacy, tackling biases, and fostering transparency are crucial ethical responsibilities that libraries must maintain. The ethical issues related to AI are intricate and diverse, involving concerns such as privacy, equity, clarity, responsibility, employment, independent decision-making and societal consequences. Confronting these ethical dilemmas necessitates a cross-disciplinary approach, engaging technologists, ethicists, lawmakers, and the broader community. By emphasizing ethical standards in AI applications, librarians can exploit its transformative capabilities while ensuring the rights and welfare of library users are protected (Bamigbola and Joseph, 2025).

Troubleshooting Skills

Due to their experience in delivering diverse training programs for library clients, librarians are anticipated to have instructional knowledge to address minor issues with library systems that do not necessitate expert intervention (Ferguson and Harrington, 2020; Raju, 2020). The benefit of having fundamental troubleshooting abilities is that it shortens the duration of time one must wait for services to be provided. In the context of AI use, librarians equipped with fundamental troubleshooting abilities can successfully resolve small technical problems that occur while utilizing AI tools, thereby ensuring continuous service delivery. This skill set enables them to sustain the seamless functioning of AI-based systems without needing to frequently depend on outside specialists. Additionally, it facilitates faster problem-solving, which enhances user satisfaction and confidence in AI-driven services. In the end, such competencies empower librarians to effectively oversee and support AI technologies in their libraries.

Programming and Scripting

The ability to code in languages like Python has become more crucial for librarians as they incorporate AI technologies (Ahmed, 2019). These capabilities enable librarians to tailor AI applications to their specific library needs by creating or altering code, incorporating AI features through APIs to link with library systems and services, and designing automation scripts to reduce repetitive tasks, which enhances productivity and allows for a greater emphasis on more valuable activities. Furthermore, the ability to write programs will allow librarians to create user-centered designs. Implementing user-centered design is vital for ensuring that AI-based services align with the requirements and expectations of library patrons (Okoro, 2020). This involves librarians performing user research to gain insights into user behaviors, preferences, and challenges; crafting user-friendly, intuitive, and accessible interfaces.

Using and Managing Big Data

In today's AI-driven landscape, librarians must possess skills and expertise in handling and utilizing big data, electronic data management, data curation, building embedded relationships, engaging in digital humanities, and facilitating scholarly communication (Lawal, 2021, Tella, 2023). The application of big data within libraries is essential, as it offers solid evidence that can assist libraries in enhancing their services and products. For librarians, developing expertise in big data management and related skills is crucial for making data-informed choices and improving service delivery in the age of AI. By skillfully analyzing and organizing large datasets, librarians can uncover user trends, assess resource utilization, and enhance library operations. These capabilities allow them to create data-driven services that address the changing requirements of their communities. In the end, big data enables librarians to transition from conventional roles to essential players in the digital transformation.

Professional Development of Librarians

The professional growth of librarians in today's AI-driven environment can be enhanced through collaborations, partnerships, and certifications. Library organizations can offer credentials in digital technologies and AI, helping librarians gain specialized expertise. Working together with data science programs or forming alliances with technology firms can provide librarians with practical experience and knowledge of current trends. Fostering lifelong learning and offering chances for ongoing professional development, such as webinars, peer learning groups and

conferences, libraries can promote a culture of continuous education. In a world increasingly influenced by AI, this approach ensures that librarians stay at the forefront of new technologies and can effectively meet the evolving needs of library users.

Building partnerships with local technology professionals, universities and AI developers is crucial for accessing outside expertise (Adekunle, 2018). Since Nigerian libraries may not have in-house AI experts, collaborating with external partners becomes vital. Universities can provide a rich source of AI knowledge, research insights, and possible talent. Teaming up with local technology specialists and AI developers can help in customizing and implementing AI solutions that meet the specific needs of libraries. Furthermore, collaboration with library consortia can prove to be a strategic tactic. By pooling resources and expertise within consortia, libraries can engage in collaborative AI projects, exchange best practices, and jointly address challenges. Consortia can also help with the collective acquisition of AI tools and technologies, making them more budget-friendly for individual libraries.

For librarians, building partnerships with local technology specialists, universities, and AI developers creates valuable chances to close knowledge gaps and enhance technological capabilities within libraries. Through these collaborations, librarians can access specialized knowledge, training, and innovative solutions that may not be available internally. Working together with universities and consortia allows librarians to participate in joint AI projects, exchange best practices, and collectively tackle implementation obstacles. This cooperative strategy empowers librarians to actively influence and tailor AI tools that improve library services and maintain their significance in a swiftly changing digital environment. Mane (2025) highlighted some of the strategies that could be adopted to develop librarians professionally, these include:

Workshops and Certification Programmes

To provide librarians with the necessary tools to navigate AI-driven advancements, it is essential to implement workshops and certification initiatives. Through targeted workshops on AI ethics, machine learning applications, data management and foundational AI concepts, librarians will acquire hands-on experience. University programs or library associations might establish certification tracks that formally recognize proficiency in areas such as data stewardship, digital literacy, and the utilization of AI tools. These programs promote lifelong learning and continuous skill enhancement, empowering librarians to effectively integrate AI into library services.

Collaborations with Technology Firms

To keep libraries in Nigeria at the forefront of AI advancements, forming alliances with technology firms is crucial. By partnering with tech companies, libraries can enhance their operations and services for users by gaining access to cutting-edge AI tools, data analytics platforms and cloud services. Such partnerships provide Nigerian librarians with early access to innovations tailored to their requirements, along with training and support. Close collaboration with industry experts will enable libraries to effectively implement AI solutions while tackling challenges such as data privacy, algorithmic bias, and accessibility for users. This approach will ultimately enrich the services libraries offer and enhance the experiences of their users.

Incorporating AI in Library Education

To equip future librarians in Nigeria to adapt to evolving technologies, it is essential to include AI in library education. The curricula in library schools should incorporate data analytics, machine learning, the ethics of AI and the foundational concepts of AI. Students will acquire practical experience through hands-on training with AI-powered tools such as chatbots and automated cataloging systems. By partnering with technology companies and offering certification programs, libraries can ensure that graduates are well-versed in both the technical and ethical dimensions of AI. This integration prepares a new generation of professionals to lead and innovate by helping future librarians navigate the opportunities and challenges presented by AI. Educating about AI in library and information science not only enables students to comprehend what AI technologies are and how they function, but it also encourages the next generation of AI researchers, ethical designers, and software developers (Pedró, Subosa, Rivas, Valverde, 2019).

A study conducted by Laupichler et al. (2022) in academic institutions in Kenya argues that as AI technology advances, embedding AI literacy into Library and Information Science (LIS) education is not merely a progressive move but an essential requirement that aligns information professionals with the needs of the digital era. This incorporation serves as a proactive response to the shifting global information environment, promoting the growth of a group of information professionals who can skillfully navigate and make valuable contributions to the changing digital landscape. Moreover, the Global Student Survey (2023) regarding the influence of Generative AI on higher education reveals that nearly 65% of students from 15 different countries, including Kenya, express a desire for their curriculum to feature training in AI tools pertinent to their professional futures. As educational institutions aim to prepare their students with the necessary

knowledge and skills for success in the 21st-century job market, the inclusion of AI literacy in academic curricula has become essential for curriculum development (Chen et al., 2020).

Continuous Learning Opportunities

To remain updated on the latest advancements in AI, it is essential for librarians to have access to ongoing educational opportunities. Libraries in Nigeria should offer continued education on advanced technologies such as AI, machine learning, and data management via webinars, online courses and collaborative learning groups. Encouraging participation in workshops and conferences helps librarians discover new resources and best practices in the industry. Furthermore, specialized certifications and hands-on experience can be gained through collaborations with technology companies and educational institutions. In a world increasingly influenced by AI, fostering a culture of continuous learning ensures that librarians remain adaptable, enhancing their skills and improving library services.

Conclusion

The integration of artificial intelligence into library services is transforming the skill set required of future librarians in Nigeria. As libraries in Nigeria evolve into technologically advanced knowledge centers, librarians must acquire competencies that extend beyond traditional library to include advanced ICT skills such as machine learning, natural language processing, big data analytics, and programming. Equally, skills including ethical awareness, data management, using and managing big data, programming, AI literacy, troubleshooting skills, user-oriented design are important skills needed by librarians in this AI-driven society. Professional development through training programs, workshops, certifications and collaborations with technology experts and universities is crucial to building these capacities. Ultimately, equipping librarians in Nigeria with AI-driven technical expertise, ethical competencies, and continuous learning opportunities will enable libraries to deliver innovative, user-centric and ethically responsible services, ensuring their relevance and sustainability in the rapidly evolving digital age.

Recommendations

The following recommendations were made:

1. Libraries should create a culture of lifelong learning by providing ongoing opportunities such as webinars, conferences, and peer learning sessions on emerging AI trends. Additionally, ethics and data privacy workshops could be conducted quarterly to ensure librarians remain

updated on ethical AI practices and evolving regulatory frameworks. This continuous review ensures that professional development keeps pace with technological changes.

2. Libraries should establish structured training programs focused on AI literacy, data management, ethical AI use and emerging digital tools. This can be achieved through workshops, online certification programs and partnerships with library associations and universities. A phased approach can be adopted starting with foundational AI concepts, followed by specialised training on practical AI applications in library services.
3. The library management should actively seek collaborations with external partners, including universities and local technology experts, to access AI knowledge and expertise. Additionally, libraries should consider forming consortia to collectively address AI challenges and share resources.

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