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FROM SEARCH TO SYNTHESIS: TRANSFORMING INFORMATION LITERACY IN THE AGE OF GENERATIVE AI

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Abstract

This study explores the evolving role of generative artificial intelligence (AI) in redefining information literacy within academic libraries, with a specific focus on the Nigerian context. As generative AI tools like ChatGPT transition information retrieval from search-based to synthesis-based interactions, they offer new opportunities for enhancing research, teaching, and user engagement. The paper examines the technical foundations of AI, its applications in library functions such as cataloguing, recommendation systems, and virtual reference services, and outlines the transformative benefits for Nigerian libraries. However, the study also addresses significant challenges including infrastructural deficits, low AI literacy, data privacy risks, and ethical concerns. In conclusion the researcher highlights that while the integration of AI into Nigerian libraries holds immense potential, it requires strategic planning, investment, and interdisciplinary collaboration. Recommendations include strengthening infrastructure, providing AI training, developing ethical guidelines, and initiating pilot projects. This work contributes to the discourse on digital transformation in Nigerian library systems and offers actionable insights for stakeholders seeking to future-proof information services in the AI era.

***Keywords*:** Generative Artificial Intelligence, Information Literacy, Academic Libraries, Digital Transformation, AI Integration Challenges

Introduction

Generative Artificial Intelligence (AI) is rapidly redefining the landscape of information literacy by transforming how individuals search for, evaluate, and synthesize information. Traditionally, information literacy focused on locating credible sources, evaluating their authority, and applying the information effectively. However, the rise of generative AI tools—such as ChatGPT, Google Gemini, and Microsoft Copilot—has shifted the focus from mere retrieval to advanced synthesis, raising both opportunities and challenges for learners and researchers alike. These tools leverage large language models (LLMs) to generate human-like responses, summarize texts, answer complex queries, and even

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co-author academic content, profoundly impacting how knowledge is consumed and created (Dwivedi et al., 2023).

In developed countries, educational institutions and libraries are increasingly integrating generative AI into digital literacy frameworks to help users critically engage with AI-generated content. For instance, universities in Canada, the United States, and the United Kingdom have introduced training modules and workshops on AI-assisted research and ethical AI usage in academic writing (Andersen & Conklin, 2023). According to a 2024 EDUCAUSE report, over 60% of academic libraries in North America have begun incorporating generative AI literacy into their information instruction programs. Similarly, in Australia and New Zealand, librarians are collaborating with faculty to teach students how to evaluate AI-generated outputs, identify bias, and ensure responsible usage in scholarly communication (Taylor et al., 2024).

In Asia, countries like Singapore, Japan, and South Korea are embedding AI-driven critical thinking modules into their higher education curricula to build students' competencies in managing machine-generated content. China's Ministry of Education has also launched initiatives to equip university librarians and instructors with skills in AI-facilitated instruction, promoting informed synthesis over rote learning (Zhao & Hu, 2023). In India, digital literacy campaigns now emphasize AI awareness, particularly in managing misinformation and understanding the provenance of automatically generated responses (Kumar & Sharma, 2024).

Across Africa, the use of generative AI in libraries and classrooms is emerging but gaining traction. South African universities are piloting AI-enhanced information literacy programs that emphasize critical reading, prompt design, and evaluation of synthetic content (Adebayo & Molefe, 2024). Nigeria is witnessing early but significant efforts in this area, especially in federal institutions like the University of Lagos and Obafemi Awolowo University, which are exploring how generative AI can support students' research and writing practices (Iroha & Iwhiwhu, 2022). However, major obstacles persist, including limited digital infrastructure, lack of training for librarians, and concerns over academic integrity. A study by Agboola and Eze (2023) found that only 18% of academic libraries in Nigeria have actively engaged with generative AI tools in their digital literacy programming.

Despite these challenges, Nigerian library professionals are beginning to recognize the importance of rethinking traditional approaches to information literacy. Generative AI shifts the user's role from an active seeker of information to a critical curator and synthesizer of AI-generated content. This calls for a new set of digital competencies that emphasize prompt engineering, source verification, ethical usage, and intellectual ownership. The Nigerian Library Association (NLA) and some university library

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schools are now including topics such as AI literacy, disinformation detection, and algorithmic accountability in their professional development agendas (Obi & Aina, 2023).

From a computer science and LIS integration perspective, generative AI represents a double-edged sword: it enhances productivity and accessibility while simultaneously posing risks of misinformation, plagiarism, and diminished critical thinking. Nigerian tertiary institutions—such as Kaduna State University (KASU) must prioritize digital literacy policies that prepare students and researchers for an information environment where synthesized content is ubiquitous. Redesigning information literacy to include generative AI awareness will not only strengthen academic integrity but also foster independent thinking and responsible knowledge production (Akanbi, 2023).

This study is important as it explores the evolving nature of information literacy in Nigerian academic environments, focusing on the impact of generative AI on research practices, digital skills, and ethical considerations. By examining how students and researchers interact with generative AI tools, the study aims to provide actionable insights for policymakers, librarians, and educators seeking to modernize digital competency frameworks in line with global standards.

The Evolution of Information Literacy

The concept of information literacy has evolved significantly with the advent of generative Artificial Intelligence (AI). Traditionally, information literacy centered on searching and evaluating information from various sources, emphasizing critical appraisal and validation of retrieved data (Head, 2013). This model focused on the user's ability to navigate databases, identify credible sources, and synthesize information independently. However, the emergence of generative AI tools such as ChatGPT has transformed this paradigm. The new model extends beyond mere search to include understanding, synthesizing, and creating knowledge with AI support (Brown et al., 2020). Users can now leverage AI to generate summaries, draft content, and integrate diverse information sources seamlessly, which enhances the depth and efficiency of research activities.

AI technologies foster critical thinking and research efficiency by providing interactive platforms that assist users in exploring complex topics, asking follow-up questions, and receiving tailored insights (Wang et al., 2023). This shift necessitates a redefinition of information literacy skills to incorporate AI literacy and responsible use of generative tools in academic contexts.

Generative AI in Libraries

Generative AI applications are increasingly integrated into library systems to augment traditional services. Key implementations include virtual assistants, which provide real-time user support; recommendation systems, which tailor resource suggestions based on user behavior; and content

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summarization tools, which help condense lengthy documents for easier consumption (Smith & Kumar, 2023). These technologies enhance cataloguing by automating metadata generation and improving resource discoverability through natural language processing (NLP) techniques (Mulla & Chandrashekara, 2021). Furthermore, AI facilitates personalized services and bolsters reference support, enabling librarians to provide more responsive and user-centered assistance.

Globally, many academic libraries are adopting generative AI tools to stay ahead in the digital transformation of information services. For instance, institutions in North America and Europe employ AI-driven chatbots and virtual research assistants that have significantly improved user satisfaction and operational efficiency (Cheng, Yang & Liu, 2024).

Benefits for Nigerian Libraries

The integration of generative AI into Nigerian libraries promises several critical benefits. Firstly, it enables improved access and retrieval of relevant information, overcoming limitations posed by traditional keyword searches and enabling semantic understanding of queries (Oyelude, 2022). Additionally, generative AI facilitates personalized learning and research assistance by adapting to individual user preferences and offering context-aware recommendations, which is particularly valuable in resource-constrained environments (Adegbile & Ojo, 2023).

Moreover, the automation of routine tasks such as cataloguing, circulation management, and user inquiry handling can significantly reduce the workload on library staff, freeing librarians for higher-level research support and digital literacy training (Ifijeh & Yusuf, 2020). Finally, these advancements help bridge gaps in resource availability and user skills, offering scalable, cost-effective solutions that align Nigerian libraries with global trends in information service delivery (Chandran, 2023).

Challenges of Generative AI in Nigerian Libraries

While Generative Artificial Intelligence (AI) presents transformative opportunities for enhancing information literacy in Nigerian libraries, its integration is confronted by several critical challenges. One of the most significant barriers is the lack of technological infrastructure. Many academic libraries in Nigeria operate with outdated systems, unstable internet connectivity, and limited access to high-performance computing resources needed to run advanced AI tools. This infrastructural deficit greatly restricts the use of real-time generative platforms such as ChatGPT and Copilot in academic and library settings (Agboola & Eze, 2023).

Equally problematic is the low level of digital and AI literacy among librarians, faculty, and students. Most library personnel lack the technical training required to effectively operate or supervise the use of generative AI tools in research support and instructional services. According to Obi and Aina (2023),

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less than 15% of academic librarians in Nigeria have received any formal education or training in AI-related competencies, resulting in a significant skills gap that limits adoption and innovation.

Ethical concerns also pose substantial challenges. The use of generative AI raises issues related to misinformation, content hallucination, and academic dishonesty. For instance, without strong ethical guidelines, students may use AI-generated texts without proper attribution, leading to plagiarism and intellectual property violations (Andersen & Conklin, 2023). Furthermore, the lack of transparency in how generative models produce their outputs makes it difficult for users to assess the credibility and accuracy of information, thereby complicating the traditional information evaluation process.

Data privacy and security remain another area of concern. Generative AI tools often require large datasets or user inputs, which may inadvertently expose sensitive information. In the absence of clear data protection policies and cybersecurity protocols in many Nigerian academic institutions, there is a heightened risk of data misuse or unauthorized access (Ifijeh, 2022). Additionally, Nigerian libraries have yet to develop institutional frameworks to monitor and audit the use of these technologies effectively.

Financial limitations further hinder widespread adoption. Most libraries in Nigeria operate under constrained budgets, which prioritize basic library operations over emerging technologies. Procuring subscriptions to premium generative AI tools, training programs, or advanced computing infrastructure is often financially unfeasible for many institutions (Iroha & Iwhiwhu, 2022). Without strategic funding and policy support, these constraints will continue to impede the integration of AI into information literacy programs.

These challenges highlight the urgent need for comprehensive planning, investment, and collaboration to ensure that the adoption of generative AI in Nigerian libraries is ethical, effective, and sustainable.

Conclusion

Generative Artificial Intelligence is redefining the landscape of information literacy by transitioning users from passive information seekers to active synthesizers and evaluators of AI-generated content. Its potential to enhance research, teaching, and library services in Nigerian academic institutions is profound. However, this transformation must be approached strategically to overcome deep-rooted challenges, including limited infrastructure, low digital literacy, ethical uncertainties, and inadequate policy frameworks. For institutions like Kaduna State University and others nationwide, embracing generative AI is not merely about adopting new tools it is about fundamentally reshaping how knowledge is discovered, interpreted, and communicated in the digital age. With the right support,

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Nigeria's library systems can evolve into intelligent, user-centered information hubs that promote critical thinking, innovation, and academic integrity.

Way Forward

To ensure the meaningful integration of generative AI into Nigerian libraries and information literacy programs, the following strategic actions are recommended:

1. Infrastructure Investment: Government bodies and educational institutions must prioritize the upgrade of library infrastructure, ensuring stable internet connectivity, sufficient power supply, and access to high-performance computing devices that support generative AI tools.

2. Capacity Building: Continuous training and upskilling of library staff, educators, and students in AI, data ethics, and prompt engineering should be institutionalized. Certification programs and partnerships with computer science departments can bridge the existing knowledge gap.

3. Cross-disciplinary Collaboration: Institutionalize collaboration between librarians, computer scientists, and education technologists to co-design AI tools and curricula that align with local educational needs and values.

4. Policy and Ethical Frameworks: National regulatory bodies and academic institutions should develop clear policies on the ethical use of generative AI, emphasizing academic integrity, data privacy, algorithmic accountability, and transparency.

5. Pilot Projects and Research: Universities and library associations should initiate context-specific pilot projects that explore how generative AI can be used to support information literacy in Nigerian settings. Lessons learned from these projects can inform scalable implementation strategies.

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