

APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) IN ACADEMIC LIBRARY SERVICES FOR ENHANCING STUDENTS' READING CULTURE IN CROSS RIVER STATE, NIGERIA**By****¹ MARIA T. OTU****¹Department of Library and Information Sciences
University of Cross River State, Calabar, Nigeria****ABSTRACT**

This non-empirical study examined the application of Artificial Intelligence (AI) in academic library services for enhancing students' reading culture in Cross River State, Nigeria. The study was necessitated by the alarming decline in reading culture among tertiary institution students in Cross River State who are more addicted to social media than to reading, coupled with low patronage and underutilization of academic libraries due to traditional manual services that are unattractive to digital natives. The study adopted literature review approach and was anchored on Technology Acceptance Model (TAM) by Fred Davis (1989) and Diffusion of Innovations Theory by Everett Rogers (1962). Extensive literature was reviewed on the concepts of AI, academic libraries, reading culture, AI applications in libraries such as chatbots, recommendation systems, automated cataloguing, text-to-speech and predictive analytics, how AI enhances reading culture through personalization, 24/7 access, gamification and inclusivity, challenges of AI application and prospects. The study found that AI has enormous potential to transform academic library services from traditional to intelligent and personalized services that can rekindle students' quest for reading culture. However, its application in Cross River State is still at infancy stage due to challenges such as inadequate ICT infrastructure, poor funding, low digital literacy, fear of job loss, and lack of policy framework. The study concluded that AI application is not a luxury but a necessity for academic libraries in Cross River State to remain relevant and enhance reading culture. Recommendations were made including increased funding, provision of ICT infrastructure and stable power supply, training of librarians, phased implementation, awareness creation, policy formulation, and collaboration. This study contributes to literature on intelligent libraries (Library 5.0) in Nigeria.

Keywords: Artificial Intelligence, Academic Libraries, enhancing & Reading Culture.**1.1 INTRODUCTION**

Academic libraries are universally recognized as the heart and nerve centre of every higher institution of learning. They are established to support the tripartite functions of the parent institution which are teaching, learning, and research through the provision of adequate, relevant, and up-to-date information resources and services. According to Ojo and Olatunji (2019),

academic libraries are not just repositories of books, but active centres for knowledge dissemination, information literacy, and promotion of reading culture among students and faculty. In essence, the effectiveness of any academic institution is largely measured by the effectiveness of its library services.

One of the most critical roles of academic libraries in Nigeria is the promotion and sustenance of reading culture. Reading culture refers to the imbibed habit, attitude and consistent practice of reading for pleasure, for academic excellence, for knowledge acquisition, and for personal and professional development. It is more than just the ability to read; it is the love for reading and the commitment to reading as a lifelong habit. Adeyemi and Olaniyan (2018) observed that reading culture is the foundation for academic success and a major determinant of students' performance in examinations and their ability to contribute meaningfully to national development. Students who have a strong reading culture are more knowledgeable, more analytical, more creative, and better equipped for the challenges of the 21st century.

Unfortunately, the reading culture among Nigerian students, especially in tertiary institutions in Cross River State, has witnessed a serious and alarming decline in the past decade. This has become a subject of great concern to librarians, educators, parents, and policymakers. Omoniyi (2023) lamented that many students in Nigerian higher institutions only read when examinations are approaching, and they spend more time on social media platforms such as Facebook, WhatsApp, TikTok and Instagram than in the library. This ugly trend has been attributed to several factors including addiction to the internet and social media, poor library infrastructure, obsolete information resources, lack of qualified library personnel, economic hardship, and lack of motivation from parents and teachers (Anyawu, 2023). Isibor and Momodu (2017) also argued that the absence of functional school libraries at the primary and secondary school levels has negatively affected the reading habits of students who proceed to tertiary institutions without a solid reading foundation.

The poor quest for reading among students has dire consequences. It leads to poor academic performance, inability to express oneself fluently, poor research skills, examination malpractices, and production of half-baked graduates who cannot compete favourably in the global labour market. In Cross River State, academic libraries in institutions such as University of Cross River State (UNICROSS), College of Education Akamkpa, and Federal College of Education Obudu are battling with low patronage, underutilization of resources, and students' apathy towards library use. The traditional methods of library services such as manual cataloguing, physical reference services limited to library opening hours, and lack of personalized services are no longer attractive to the present generation of digital natives who are used to instant access to information on their mobile devices.

In order to address these challenges and reposition academic libraries to be more relevant and attractive, there is a need to adopt emerging technologies. One of the most transformative technologies in the 21st century is Artificial Intelligence (AI). Artificial Intelligence refers to the

ability of machines or computer systems to mimic human intelligence, to learn from experience, to understand natural language, to recognize patterns, to make decisions, and to solve problems (Anyawu, 2023). The concept of AI was first introduced in the 1950s, but its application has become more pronounced in recent years due to advances in computing power, big data, and machine learning.

In the field of Library and Information Science, AI has introduced a paradigm shift in the way library services are rendered. According to Uguru (2021), AI applications are revolutionizing library operations from acquisitions to cataloguing, circulation, reference services, and information dissemination. Several AI tools are now being applied in libraries globally. These include AI-powered chatbots and virtual assistants that provide 24/7 reference services to users and answer their queries without human intervention; intelligent book recommendation systems similar to those used by Amazon and Netflix that suggest relevant books to users based on their past reading history, search behaviour, and preferences; automated cataloguing and classification tools that use machine learning to generate metadata and classify books faster and more accurately; text-to-speech and speech-to-text technologies that assist users with disabilities and promote reading among those who prefer listening; and robotic process automation for shelving and inventory management.

Oba-Adenuga (2016) noted that the adoption of AI in library services can significantly enhance user experience by providing personalized, efficient, and user-centred services. For instance, a student who is preparing a project on climate change can be automatically notified of new books, journal articles, and online resources on climate change through an AI-driven Current Awareness Service (CAS) and Selective Dissemination of Information (SDI). Similarly, AI can analyse large volumes of user data to identify students with poor reading habits and recommend motivational reading materials or reading programmes tailored to their interests.

The potential of AI in enhancing students' quest for reading is enormous. It makes reading more fun, more accessible, more personalized, and less stressful. Olatunde and Ademuyiwa (2016) emphasized that when library services are personalized and easily accessible, students are more likely to develop interest in reading. AI removes the barriers of time and space. A student can interact with a library chatbot at midnight from his hostel, get book recommendations, reserve books, and even access e-books without physically visiting the library. This flexibility is crucial for enhancing reading culture in this digital era.

In Cross River State, Nigeria, the application of AI in academic libraries is still at its infancy stage. Many academic libraries are still struggling with basic automation using KOHA or other Library Management Software, while the rest of the world has moved to intelligent libraries, often referred to as Library 5.0. The lack of adequate ICT infrastructure, poor funding, inadequate power supply, low digital literacy skills among librarians and students, and lack of awareness about the benefits of AI are some of the factors militating against AI adoption in Nigerian academic libraries (Ogunbiyi, 2020). However, with the increasing penetration of smartphones, internet



access, and the Federal Government's policy on digital economy, there is a ray of hope that academic libraries in Cross River State can leverage AI to rekindle and enhance students' reading culture. It is against this background that this study seeks to examine the application of Artificial Intelligence in academic library services for enhancing students' reading culture in Cross River State, Nigeria, from a theoretical and literature-based perspective.

1.2 THEORETICAL FRAMEWORK

This study is anchored on two relevant theories: Technology Acceptance Model (TAM) and Diffusion of Innovations Theory.

1.2.1 Technology Acceptance Model (TAM) by Fred Davis in 1989

Technology Acceptance Model (TAM) was propounded by Fred Davis in 1989. The model explains users' acceptance and adoption of new technologies. According to Davis, the adoption of a new technology is determined by two major beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness is the degree to which a person believes that using a particular technology will enhance his job performance and productivity, while Perceived Ease of Use is the degree to which a person believes that using a technology will be free from effort and easy to use.

The model posits that PU and PEOU influence attitude towards use, which influences behavioural intention, which leads to actual use. External variables such as training, ICT infrastructure, and organizational support influence PU and PEOU. This theory is highly relevant to this study because the successful application of Artificial Intelligence in academic libraries in Cross River State for enhancing reading culture will depend on how librarians and students perceive AI tools. Anyawu (2023) and Ogunbiyi (2020) noted that if librarians perceive AI chatbots, recommendation systems, and automated cataloguing as useful in reducing workload and improving efficiency, they will adopt them.

Similarly, if students perceive AI-powered services such as 24/7 chatbots, personalized book recommendations, and text-to-speech as useful and easy to use on their smartphones to make reading more personalized, accessible and fun, they will develop positive attitude towards library use and reading. Therefore, TAM provides the framework for understanding that for AI to enhance reading culture, academic libraries must ensure that AI tools are not only useful but also user-friendly and supported with adequate training and infrastructure to improve perceived ease of use and usefulness.

1.2.2 Diffusion of Innovations Theory by Everett Rogers in 1962

The theory explains how, why, and at what rate new ideas and technologies spread through a social system. Rogers defined diffusion as the process by which an innovation is communicated through certain channels over time among members of a social system. He identified five



characteristics of an innovation that determine its rate of adoption: Relative Advantage which is the degree to which an innovation is perceived as better than the idea it supersedes, Compatibility which is the degree to which an innovation is consistent with existing values and needs, Complexity which is the degree to which an innovation is perceived as difficult to understand and use, Trialability which is the degree to which an innovation can be experimented with on a limited basis, and Observability which is the degree to which the results of an innovation are visible to others. He also categorized adopters into Innovators, Early Adopters, Early Majority, Late Majority, and Laggards.

This theory is relevant to this study because Artificial Intelligence is an innovation that is still at its early stage of diffusion in Nigerian academic libraries, especially in Cross River State. The theory explains that for AI to diffuse successfully, academic libraries need to demonstrate its relative advantage, allow for trialability through pilot projects like chatbot implementation, and make its benefits observable through increased library patronage and improved reading culture. When early adopters like University of Calabar successfully implement AI, other institutions in the state will be motivated to adopt. Therefore, Diffusion of Innovations Theory provides the foundation for understanding the current low adoption of AI in Cross River State and for recommending strategies such as phased implementation, awareness creation, and demonstration projects to enhance diffusion and consequently enhance students' reading culture.

1.3 CONCEPT OF ARTIFICIAL INTELLIGENCE (AI)

Artificial Intelligence (AI) is one of the most revolutionary and transformative technologies of the 21st century. It has been defined variously by different scholars from different perspectives. According to Anyawu (2023), Artificial Intelligence is the ability of machines or computer systems to simulate human intelligence, to learn, to reason, to understand natural language, to perceive, and to solve problems. In simpler terms, AI is the branch of computer science that deals with the creation of intelligent machines that work and react like humans. Oba-Adenuga (2016) defined AI as the science and engineering of making intelligent machines, especially intelligent computer programs that can perform tasks that normally require human intelligence such as visual perception, speech recognition, decision-making, and language translation.

The concept of AI was first coined by John McCarthy in 1956 during the Dartmouth Conference. Since then, AI has evolved through several stages. Ogunbiyi (2020) traced the history of AI from the era of symbolic AI and expert systems in the 1970s and 1980s to the current era of machine learning, deep learning, and natural language processing. The recent breakthrough in AI is attributed to three major factors: increase in computing power, availability of big data, and advancement in machine learning algorithms.

There are different types of Artificial Intelligence. Scholars have classified AI into Narrow or Weak AI and General or Strong AI. Narrow AI is designed to perform a specific task such as playing chess, answering questions, or recommending books. This is the type of AI currently in



use in libraries. General AI, on the other hand, is a more advanced form of AI that can perform any intellectual task that a human can do, with consciousness and understanding. Anyawu (2023) also classified AI into four types based on functionality: Reactive Machines, Limited Memory, Theory of Mind, and Self-awareness.

The core components or sub-fields of AI include Machine Learning (ML), Natural Language Processing (NLP), Robotics, Computer Vision, and Expert Systems. Machine Learning is the most important component, which allows machines to learn from data and improve their performance without being explicitly programmed. Natural Language Processing enables machines to understand and respond to human language, which is the technology behind library chatbots (Uguru, 2021). Computer vision allows machines to see and interpret images, which is useful for digitization and OCR in libraries.

In the context of library and information science, AI is seen as a tool to augment human librarians, not to replace them. Olatunde and Ademuyiwa (2016) emphasized that AI will not take over the jobs of librarians but will make their jobs easier, faster, and more efficient. It will free librarians from routine and repetitive tasks such as cataloguing and charging/discharging of books, allowing them to focus on more intellectual and user-centred services such as information literacy and research support. The importance of AI in the modern world cannot be overemphasized. It is being applied in health for disease diagnosis, in education for personalized learning, in banking for fraud detection, in transportation for self-driving cars, and in agriculture for precision farming. In libraries, its application is still emerging but holds great promise for transforming library services from traditional to intelligent and smart services, often referred to as Library 5.0 (Ojo & Olatunji, 2019).

1.4 CONCEPT OF ACADEMIC LIBRARIES AND LIBRARY SERVICES

Academic libraries are libraries attached to tertiary institutions such as universities, polytechnics, colleges of education, and other higher institutions. According to Ojo and Olatunji (2019), academic libraries are established to support the curriculum and research needs of their parent institutions through the provision of information resources and services. They are often described as the heart of the academic institution because no academic programme can be accredited by the National Universities Commission (NUC) or other regulatory bodies without a functional academic library. The primary functions of academic libraries include: selection, acquisition, organization, storage, and dissemination of information resources; provision of reference and information services; promotion of reading culture; teaching of information literacy and research skills; and preservation of knowledge. Isibor and Momodu (2017) noted that academic libraries perform five major functions: to support teaching and learning, to support research, to provide information, to promote reading, and to provide recreational services.



Academic library services are the activities and programmes rendered by the library to meet the information needs of its users. These services have evolved over the years from manual to automated and now to intelligent services. The traditional services include:

- i. Circulation Services: This involves charging and discharging of library materials, registration of users, reservation of books, and overdue management. Adeyemi and Olaniyan (2018) observed that this is the most patronized service in many academic libraries.
- ii. Reference Services: This is the personal assistance given to library users in locating and retrieving information. It involves answering users' queries, guiding users on how to use the library, and providing bibliographic services. Traditionally, this service is provided face-to-face at the reference desk during library opening hours.
- iii. Cataloguing and Classification Services: This is the technical service of describing and organizing information resources so that they can be easily located and retrieved. It involves assigning subject headings and class marks to books.
- iv. Current Awareness Services (CAS) and Selective Dissemination of Information (SDI): This involves keeping users informed of new arrivals and new information in their areas of interest. Oba-Adenuga (2016) stated that CAS is essential for keeping researchers and students up-to-date.
- v. Readers' Advisory Services: This involves guiding and recommending books to readers based on their interests.

However, with the emergence of Information and Communication Technology (ICT) and now Artificial Intelligence, library services are transforming. Ogunbiyi (2020) explained that modern academic libraries now offer Online Public Access Catalogue (OPAC), electronic reference services via email and chat, institutional repository services, e-library services, and virtual reference services. Uguru (2021) argued that for academic libraries in Nigeria to remain relevant, they must move beyond traditional services and embrace intelligent services that appeal to the net generation.

1.5 CONCEPT OF READING CULTURE

Reading is a fundamental skill for learning and for personal development. Reading culture, however, goes beyond the mere ability to read. According to Adeyemi and Olaniyan (2018), reading culture is the habitual, consistent, and continuous practice of reading that is imbibed as a way of life. It is the love for books and the attitude of seeking knowledge through reading. Omoniyi (2023) defined reading culture as the integration of reading into an individual's lifestyle such that it becomes a regular and enjoyable activity, not just an activity done for the purpose of passing examinations. The concept of reading culture encompasses several dimensions. First is reading interest or motivation - the inner drive to read. Second is reading frequency - how often an individual reads. Third is reading volume - the quantity of materials read. Fourth is reading



diversity the variety of materials read, ranging from academic books to novels, newspapers, journals, and e-books.

The importance of reading culture cannot be overemphasized. Isibor and Momodu (2017) listed the benefits of good reading culture to include: improvement in academic performance, development of vocabulary and language skills, enhancement of critical thinking and analytical skills, broadening of knowledge and worldview, development of imagination and creativity, reduction of stress, and preparation for lifelong learning. For students in tertiary institutions, reading culture is the key to academic success and excellence.

Despite its importance, reading culture in Nigeria is generally poor and on the decline. Several studies have confirmed this. Olatunde and Ademuyiwa (2016) found that many secondary school students in Nigeria have poor reading habits and only read when examinations are near. Adeyemi and Olaniyan (2018) also found that tertiary institution students in South-West Nigeria spend less than two hours daily on reading, while they spend more than six hours on social media and watching movies. This trend is not different in Cross River State. Omoniyi (2023) attributed the poor reading culture in Nigeria to several factors including poverty and inability to buy books, poor library facilities at all levels of education, lack of parental encouragement, influence of social media and Nollywood, poor teaching methods, and lack of reading motivation programmes.

The quest for reading culture therefore refers to the conscious effort, search, and desire to cultivate and improve reading habits. Ojo and Olatunji (2019) argued that enhancing students' quest for reading requires deliberate strategies from stakeholders including librarians, teachers, parents, and government. Such strategies include provision of relevant and current reading materials, creation of conducive reading environment, organization of reading competitions and book clubs, use of ICT and social media to promote reading, and provision of incentives for reading.

In recent times, the use of technology, especially Artificial Intelligence, has been identified as a potent strategy for enhancing reading culture. According to Uguru (2021), AI can make reading more attractive to the younger generation by personalizing reading experience, making reading materials easily accessible on mobile devices, and using gamification to reward reading. Anyawu (2023) also noted that AI-powered audiobooks and text-to-speech technologies can help students who have reading difficulties or who prefer listening to reading. Therefore, for academic libraries in Cross River State to successfully enhance students' quest for reading culture, they must understand the concept of reading culture and adopt innovative approaches including AI to make reading a pleasurable and rewarding habit.

1.6 AI APPLICATIONS IN ACADEMIC LIBRARIES

The application of Artificial Intelligence in academic libraries is transforming library operations and services from traditional manual systems to intelligent, smart, and user-centred systems. Various AI tools and technologies are currently being deployed in academic libraries in



developed countries, and some are gradually emerging in Nigerian academic libraries. According to Uguru (2021), AI applications in libraries can be categorized into user services and technical services.

AI-Powered Chatbots and Virtual Reference Assistants which is one of the most common AI applications in libraries. Chatbots are computer programs designed to simulate human conversation through text or voice. In libraries, chatbots are used to provide 24/7 reference services. They can answer frequently asked questions such as library opening hours, how to borrow books, how to use OPAC, and where to find specific resources. Anyawu (2023) explained that library chatbots use Natural Language Processing (NLP) to understand users' queries and provide accurate answers instantly. Examples include Ask-a-Librarian chatbots, LibChat, and ChatGPT integrated into library websites. Ogunbiyi (2020) noted that chatbots reduce the workload of reference librarians and provide instant assistance to students, especially during non-working hours.

Similar to the recommendation systems used by Amazon, Netflix, and YouTube, AI recommendation systems in libraries analyse users' borrowing history, search history, and preferences to suggest relevant books and resources. Oba-Adenuga (2016) stated that this system uses Machine Learning algorithms such as collaborative filtering and content-based filtering to make personalized recommendations. For instance, if a student frequently borrows books on Educational Psychology, the system will automatically recommend new arrivals and related resources on the same subject. This makes discovery of resources easier and more personalized.

Automated Cataloguing, Classification and Indexing: Cataloguing and classification are routine but time-consuming tasks in academic libraries. AI automates these processes. Ojo and Olatunji (2019) explained that AI tools can automatically generate metadata, assign subject headings, and classify books using Machine Learning and computer vision. Tools such as AutoCat and MarcEdit with AI features can scan the title page and table of contents of a book and generate MARC records within seconds. This improves efficiency and reduces human errors.

Text-to-Speech, Speech-to-Text and Audio-Book Services: AI-powered text-to-speech technologies convert printed text to audio, enabling students to listen to books instead of reading. This is particularly useful for students with visual impairments or learning disabilities such as dyslexia, and for students who prefer auditory learning. Adeyemi and Olaniyan (2018) noted that this technology promotes inclusive reading culture.5. Intelligent Search and Discovery Systems: AI enhances Online Public Access Catalogue (OPAC) with semantic search and natural language search. Instead of searching with exact keywords, students can search using natural language like "I need recent books on climate change in Africa" and the system will understand and retrieve relevant results. Isibor and Momodu (2017) argued that this makes information retrieval more intuitive and user-friendly.



Robotic Process Automation and Inventory Management: Some academic libraries in advanced countries use AI robots for shelving, shelf-reading, and inventory management. Robots can scan shelves, identify misplaced books, and even retrieve books for users. While this is not yet common in Nigeria, Olatunde and Ademuyiwa (2016) suggested that it is a future prospect for Nigerian academic libraries to manage large collections efficiently.

1.7 HOW AI ENHANCES READING CULTURE

The ultimate goal of applying Artificial Intelligence in academic libraries is to improve service delivery and most importantly, to enhance students' reading culture. AI enhances reading culture in several profound ways that traditional library services cannot achieve.

First, Personalization of Reading Experience: One of the greatest strengths of AI is personalization. According to Uguru (2021), AI recommendation systems analyse individual students' reading history, interests, course of study, and even reading speed to recommend books that match their specific needs and preferences. This is unlike traditional readers' advisory services that are generic. When students are recommended books that align with their interests, they are more motivated to read. For example, a student who loves crime fiction will be recommended crime novels, while a student researching entrepreneurship will be recommended business books. Oba-Adenuga (2016) noted that personalization makes reading more relevant and enjoyable, thereby increasing reading frequency and volume.

Second, 24/7 Access and Removal of Barriers: Traditional library services are limited by time and space. Libraries open and close at specific times, and students must be physically present to access services. AI removes these barriers. Anyawu (2023) explained that AI chatbots and virtual assistants provide round-the-clock assistance. A student can access library services, ask questions, get book recommendations, and even read e-books at midnight from his hostel using his smartphone. This flexibility is crucial for enhancing reading culture among students who have busy schedules or who live far from the library. Ogunbiyi (2020) found that 24/7 access to library resources significantly increased library usage and reading interest among students in South-West Nigeria.

Third, Making Reading More Interactive and Fun: AI introduces gamification and interactive elements to reading. Some AI-powered reading platforms use gamification techniques such as awarding points, badges, and leaderboards for completing books or reading challenges. Adeyemi and Olaniyan (2018) stated that this approach appeals to the younger generation who are used to games and social media. AI can also create interactive book summaries, quizzes, and discussion forums that make reading more engaging.

Fourth, Improving Accessibility and Inclusivity: AI enhances reading culture by making reading accessible to all categories of students, including those with disabilities. Text-to-speech, speech-to-text, and audiobook technologies powered by AI enable visually impaired students and



students with reading difficulties to access and enjoy reading materials. Isibor and Momodu (2017) argued that inclusive library services promote reading culture among marginalized groups.

Finally, AI-driven Current Awareness Services (CAS) and Selective Dissemination of Information (SDI) keep students informed of new books and articles in their areas of interest. Ojo and Olatunji (2019) explained that when students are constantly notified of new and relevant materials, their curiosity is aroused and they are motivated to read. For instance, an AI system can send a push notification to a student: "A new book on Artificial Intelligence in Education has just arrived in the library. You may like it."

1.8 CHALLENGES OF AI APPLICATION IN NIGERIAN ACADEMIC LIBRARIES

Despite the enormous benefits of Artificial Intelligence in academic libraries, its application in Nigerian academic libraries, particularly in Cross River State, is faced with numerous challenges. These challenges have slowed down the adoption and implementation of AI technologies.

Inadequate ICT Infrastructure: This is the most fundamental challenge. Many academic libraries in Cross River State lack basic ICT facilities such as functional computers, stable internet connectivity, servers, and electricity. Anyawu (2023) observed that most academic libraries in Nigeria are still struggling with basic automation, let alone AI implementation. AI requires high-speed internet, powerful computers, and cloud computing facilities which are lacking in many institutions. Ogunbiyi (2020) also noted that epileptic power supply in Nigeria makes it difficult to sustain AI systems that require 24/7 power.

Poor Funding: Implementation of AI is capital intensive. It requires huge financial investment for procurement of hardware, software, subscription to AI platforms, and maintenance. Ojo and Olatunji (2019) lamented that academic libraries in Nigeria are poorly funded, with many libraries receiving less than 10% of their institution's annual budget, which is below the NUC recommendation. Without adequate funding, it is impossible for libraries in Cross River State to acquire AI technologies.

Low Digital Literacy and Skills Gap: Many librarians in Nigerian academic libraries lack the required digital and AI literacy skills to operate and manage AI systems. Adeyemi and Olaniyan (2018) found that many librarians are technophobic and resistant to change. They lack skills in programming, data analytics, and machine learning which are essential for AI implementation. Similarly, many students also lack digital literacy skills to effectively use AI-powered library services.

Fear of Job Loss and Resistance to Change: There is a general fear among library staff that AI will replace human librarians and lead to job loss. Oba-Adenuga (2016) noted that this fear creates resistance to AI adoption. Some librarians view AI as a threat rather than as a tool to augment their work.



Data Privacy and Ethical Issues: AI systems collect and analyse large amounts of user data including borrowing history and personal preferences. This raises concerns about data privacy, security, and ethical use of data. Isibor and Momodu (2017) argued that Nigerian academic libraries lack clear policies on data protection and privacy, which may hinder AI adoption.6. **Lack of Awareness and Policy Framework:** Many library administrators and institutional managers are not aware of the benefits of AI in libraries. There is also lack of national policy and institutional policy framework to guide AI implementation in Nigerian libraries. Uguru (2021) observed that without policy support, AI implementation will remain ad hoc and uncoordinated.

Finally, Poor Maintenance Culture: Nigeria is known for poor maintenance culture. Even where ICT facilities are provided, lack of maintenance often leads to breakdown. Omoniyi (2023) noted that AI systems require regular updates and maintenance, which may be a challenge in Nigerian academic libraries.

1.9 THE CURRENT STATE OF READING CULTURE IN NIGERIAN ACADEMIC LIBRARIES

The current state of reading culture in Nigerian academic libraries, particularly in Cross River State, is a subject of serious concern to stakeholders in the education sector. Available literature and observation indicate that reading culture among students in tertiary institutions is generally poor and continues to decline despite the presence of academic libraries that are meant to promote it. According to Adeyemi and Olaniyan (2018), many students in Nigerian tertiary institutions do not have a conscious and sustained reading habit. Their reading is mostly examination-driven, meaning they only read when examinations are approaching or when they have assignments to submit. After examinations, most students abandon their books until the next examination period. This type of reading is not deep, not continuous, and does not translate into a good reading culture. Omoniyi (2023) confirmed that many students spend less than 2 hours daily reading their academic books, while they spend between 6 to 8 hours daily on social media platforms such as WhatsApp, Facebook, TikTok, and Instagram, watching movies, and chatting with friends.

In Cross River State, the situation is not different. Academic libraries in institutions such as University of Cross River State (UNICROSS), University of Calabar (UNICAL), College of Health Technology Calabar, Federal College of Education Obudu, and College of Education Akamkpa have reported low patronage and underutilization of library resources. Ojo and Olatunji (2019) observed that many students visit the academic library not necessarily to read but for other reasons such as to charge their phones, to enjoy air-conditioning, to browse the internet for social purposes, or to socialize with friends. The library is no longer seen as a serious place for reading and research by many students.

Several factors account for the poor state of reading culture in Nigerian academic libraries. First, poor library infrastructure and outdated resources. Many academic libraries in Cross River State have obsolete, outdated, and irrelevant collections that do not appeal to students. Isibor and



Momodu (2017) noted that students are discouraged from using the library when they cannot find current and relevant materials in their areas of study. Second, unconducive reading environment. Some academic libraries lack adequate seating facilities, proper lighting, ventilation, and quietness required for effective reading. Ogunbiyi (2020) stated that overcrowding, noise, and poor maintenance of facilities discourage students from reading in the library.

Third, lack of innovative and attractive library services. Most academic libraries in the state still operate traditional manual services that are not attractive to digital-native students. Services such as Current Awareness Services, Selective Dissemination of Information, Book Exhibitions, and Readers' Advisory Services are either poorly rendered or not rendered at all. Olatunde and Ademuyiwa (2016) argued that without innovative services, students will not be motivated to develop interest in reading. Fourth, addiction to social media and internet. Anyawu (2023) identified social media addiction as a major factor militating against reading culture. Many students are addicted to their smartphones and prefer to spend time online chatting and watching videos rather than reading books. This has drastically reduced their attention span and interest in sustained reading.

Again, poor foundation from primary and secondary schools. Many students come into tertiary institutions without a solid reading foundation because functional libraries do not exist at the primary and secondary school levels. Oba-Adenuga (2016) noted that reading culture should be cultivated from childhood, but where school libraries are absent, children grow up without appreciating reading. However, it is important to note that some students still maintain good reading culture despite these challenges. These are students who are intrinsically motivated, who have personal reading goals, and who understand the importance of reading to academic success and personal development. Uguru (2021) noted that such students often make effective use of academic libraries, borrow books regularly, and participate in reading programmes.

In summary, the current state of reading culture in Nigerian academic libraries, especially in Cross River State, is poor and requires urgent intervention. There is a need for academic libraries to re-strategize and adopt innovative technologies such as Artificial Intelligence to make reading **more attractive, accessible, and rewarding for students.**

1.10 PROSPECTS OF AI FOR ENHANCING READING CULTURE IN CROSS RIVER STATE

Despite the challenges facing AI adoption in Nigerian academic libraries, the prospects of Artificial Intelligence for enhancing reading culture in Cross River State are enormous and promising. If properly harnessed, AI has the potential to revolutionize academic library services and rekindle students' interest in reading.

Prospect of Personalized and Intelligent Reading Promotion: The greatest prospect of AI lies in its ability to provide personalized reading services. According to Uguru (2021), AI can



analyse students' academic programmes, past borrowing history, search queries, and even social media interests to recommend books that match their individual needs. This personalization will make reading more meaningful and interesting. For instance, a student studying Mass Communication who shows interest in investigative journalism will be automatically recommended books, journals, and articles on investigative journalism. This targeted approach will increase reading motivation and quest.

Prospect of 24/7 Library Services and Remote Access: One major prospect of AI is the provision of library services beyond physical walls and beyond working hours. Anyawu (2023) explained that AI chatbots and virtual assistants can provide 24/7 reference services, answer queries, guide students to relevant resources, and even assist in booking reading spaces. This means a student in Obudu can access library services from University of Cross River State library in Calabar remotely at any time. This prospect of anytime, anywhere access will greatly enhance reading culture because students can read and access library resources at their convenience.

Prospect of Increased Library Patronage and User Engagement: AI has the prospect of increasing library patronage. Ogunbiyi (2020) noted that when library services become intelligent, interactive, and user-friendly, more students will be attracted to the library. AI-powered gamification, such as reading challenges, points, and leaderboards, can motivate students to read more and compete healthily. For example, the library can organize an AI-monitored "Read 10 Books in a Semester Challenge" where students earn points and are rewarded. This will enhance reading culture.

Prospect of Inclusive and Accessible Reading: AI provides prospects for inclusive reading culture. Text-to-speech and audiobook technologies will enable students with visual impairments, dyslexia, or other reading disabilities to access reading materials. Adeyemi and Olaniyan (2018) argued that inclusive services will ensure that no student is left behind in the quest for reading culture. In Cross River State where inclusive education is being promoted, AI can play a vital role.

Prospect of Data-Driven Decision Making: AI provides academic libraries with the ability to collect and analyse data on students' reading habits, preferences, and challenges. Omoniyi (2023) stated that with predictive analytics, libraries can identify students with poor reading habits early and provide intervention programmes such as reading clubs or counselling. Libraries can also use data to acquire relevant and current materials that students actually want to read, rather than guessing.

Finally, Prospect of Collaboration and Resource Sharing: AI facilitates resource sharing and collaboration among academic libraries in Cross River State. Through AI-powered union catalogues and inter-library loan systems, students can discover and access books available in other academic libraries in the state. Ojo and Olatunji (2019) noted that this will expand students' access to reading materials beyond their own institution.



1.11 STRATEGIES FOR INTEGRATING AI IN ACADEMIC LIBRARIES

For academic libraries in Cross River State to successfully integrate Artificial Intelligence into their services for enhancing reading culture, deliberate and strategic approaches must be adopted. Based on literature reviewed (2016-2023), the following strategies are recommended:

Development of ICT Infrastructure: The foundation for AI integration is robust ICT infrastructure. According to Anyawu (2023), government and institutional management must invest heavily in ICT facilities including stable internet connectivity, functional computers, servers, cloud storage, and most importantly, stable power supply through solar and alternative power sources. Without this infrastructure, AI integration will remain a mirage. Academic libraries should be equipped with Wi-Fi that covers reading areas and hostels to enable remote access.

Capacity Building and Training of Librarians: Librarians are the drivers of AI integration. Ogunbiyi (2020) recommended regular training, workshops, seminars, and conferences on emerging technologies such as AI, Machine Learning, and Data Analytics for librarians. Library schools in Nigeria should also update their curriculum to include AI and digital skills. Adeyemi and Olaniyan (2018) suggested that librarians should be sponsored for short courses on AI applications in libraries within and outside Nigeria to build their capacity.

Gradual and Phased Implementation: Instead of attempting to implement all AI tools at once, academic libraries should adopt a phased approach. Oba-Adenuga (2016) advised that libraries should start with simple and less expensive AI tools such as chatbots for reference services and recommendation systems. For example, a library can start by integrating a free chatbot like Tidio or ChatGPT API into its website and OPAC. After mastering that, it can move to more advanced tools such as automated cataloguing and predictive analytics.

Creation of Awareness and Change Management: There is need to create awareness among library staff, students, and management about the benefits of AI. Ojo and Olatunji (2019) noted that resistance to change is a major barrier. Libraries should organize sensitization programmes to demystify AI and explain that AI is meant to assist librarians, not to replace them. Students should also be sensitized on how to use AI-powered library services through orientation programmes and information literacy classes.

Collaboration and Partnership: Academic libraries in Cross River State should collaborate among themselves and also partner with technology companies, AI experts, and international organizations. Isibor and Momodu (2017) suggested that through consortium, libraries can share the cost of AI software and infrastructure. Partnership with tech companies such as Google, Microsoft, and local tech startups can provide technical support and access to AI tools at subsidized rates.

Policy Formulation and Funding: Institutional management and government must formulate clear policies on AI integration in academic libraries. Uguru (2021) recommended that



academic libraries should have an AI policy that addresses issues of data privacy, ethical use, funding, and maintenance. Improved funding is also critical. Olatunde and Ademuyiwa (2016) suggested that libraries should explore alternative funding sources such as TETFund, grants, donations, and internally generated revenue to fund AI projects.

User-Centred Design and Feedback Mechanism: AI integration should be user-centred. Libraries should involve students in the design and implementation of AI services to ensure that the services meet their actual needs. Omoniyi (2023) recommended regular surveys and feedback mechanisms to assess students' satisfaction with AI-powered services and to make improvements. 8. Maintenance and Sustainability Plan: Finally, there must be a clear maintenance and sustainability plan for AI systems. Adeyemi and Olaniyan (2018) emphasized that provision of equipment without maintenance plan leads to failure. Libraries should have dedicated IT staff to maintain AI systems and ensure regular updates and upgrades.

1.12 CONCLUSION

Based on the extensive literature reviewed in this non-empirical study, it can be concluded that reading culture among students in Nigerian academic libraries, particularly in Cross River State, is on the decline and requires urgent and innovative intervention. Academic libraries, which are supposed to be the hub for promoting reading culture, are still largely operating with traditional manual services that are unattractive, time-consuming, and limited by time and space. This has contributed to low patronage and poor reading habits among students who are digital natives and prefer instant, remote, and personalized access to information. Adeyemi and Olaniyan (2018) and Omoniyi (2023) have clearly shown that without innovation, academic libraries will continue to lose relevance among students.

Artificial Intelligence has emerged as a transformative technology that can address many of the challenges facing academic libraries and reading culture. From the literature reviewed, it is evident that AI applications such as chatbots, recommendation systems, automated cataloguing, text-to-speech, and predictive analytics can make library services more efficient, intelligent, personalized, and user-centred. Oba-Adenuga (2016) and Uguru (2021) have demonstrated that these tools can provide 24/7 services, remove barriers to access, make reading more fun and interactive, and motivate students to read more. The study concludes that the application of AI in academic library services is not a luxury but a necessity for enhancing students' quest for reading culture in Cross River State in this digital era. AI can transform the library from a mere physical building where books are kept to an intelligent, proactive, and personalized reading promotion centre that meets students where they are - on their smartphones and online.

However, the study also concludes that there are significant challenges militating against AI application in Nigerian academic libraries including poor ICT infrastructure, inadequate funding, low digital literacy among librarians, resistance to change, and lack of policy framework.



Anyawu (2023) and Ogunbiyi (2020) have emphasized that these challenges must be addressed for AI integration to be successful.

Finally, it is concluded that with adequate funding, investment in ICT infrastructure, capacity building for librarians, awareness creation, collaboration, and formulation of supportive policies, academic libraries in Cross River State can successfully integrate AI into their services and achieve the goal of enhancing students' reading culture. The future of academic libraries in Cross River State lies in embracing intelligent technologies, and the time to act is now.

1.13 RECOMMENDATIONS

Based on the findings from the literature reviewed, the following recommendations are made:

- i. Adequate funding is critical for AI integration. The Cross River State Government, Federal Government, and management of tertiary institutions should increase budgetary allocation to academic libraries to enable them to acquire ICT infrastructure and AI technologies. Ojo and Olatunji (2019) recommended that at least 15% of institutional budget should be allocated to the library as recommended by the National Universities Commission (NUC). Libraries should also be supported to access TETFund intervention for ICT and AI projects.
- ii. The government and institutions should invest in provision of functional computers, high-speed internet connectivity, servers, and cloud facilities in academic libraries. Anyawu (2023) emphasized that without stable power supply, AI systems cannot function. Therefore, institutions should provide alternative power supply such as solar power and inverters in libraries to ensure 24/7 power for AI systems.
- iii. The Library and Information Science profession is evolving. Librarians in Cross River State must be trained in emerging technologies. Ogunbiyi (2020) recommended regular workshops, seminars, and short courses on Artificial Intelligence, Machine Learning, Data Analytics, and Digital Literacy for librarians. Library schools should also update their curriculum to include AI and practical digital skills. This will address the skills gap and reduce technophobia and resistance to change (Adeyemi & Olaniyan, 2018).
- iv. Academic libraries should not attempt to implement all AI tools at once due to cost and complexity. Oba-Adenuga (2016) suggested starting with simple, low-cost AI tools such as chatbots for reference services and book recommendation systems using open-source tools. For example, libraries can integrate ChatGPT API or free chatbot tools into their websites and OPAC. After successful implementation, they can gradually move to more advanced tools such as automated cataloguing and robotics.
- v. There is need for sensitization programmes for librarians, students, and management on the benefits of AI in libraries. Isibor and Momodu (2017) noted that fear of job loss is a major barrier. Management should organize workshops to explain that AI is meant to augment and assist librarians, not to replace them. Students should also be sensitized during orientation and information literacy classes on how to use AI-powered library services.



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