

# ARTIFICIAL INTELLIGENCE: A TOOL FOR LIBRARY SERVICES AND LEARNING AMONG TERTIARY INSTITUTION STUDENTS IN SELECTED UNIVERSITIES IN OYO STATE

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**ABSTRACT** Artificial intelligence (AI) has transformed learning in tertiary institutions by enhancing library services, teaching methodologies, and student learning experiences. This study investigates the availability, acquaintance level, and usage rate of AI tools in Oyo State tertiary institution libraries; and evaluates their relationship with students' learning outcomes. Sample data from 1,131 respondents purposively chosen from 11,310 final year students of Ladoke Akintola University of Technology, Ogbomoso and University of Ibadan, were analyzed through descriptive and inferential statistics. Research instrument titled Artificial Intelligence as a Tool for Learning (AITL) was used for the study. The reliability figures for the variables were: AI availability- 0.7, AI usage- 0.7, Acquaintance level- 0.7 while AI usage in students' learning-0.7. Simple percentage, mean and standard deviation was used to answer the research questions while regression was used to test the hypothesis. The findings reveal that AI tools, such as automated classification system, intelligent retrieval systems, and adaptive learning platforms, are not fully available. Also, students exhibited limited acquaintance with advanced AI applications like virtual teaching assistants and AI-driven personalized tools. Also, the usage rate of intelligent search engines and chatbots remains low, while classification tools and virtual learning systems are more frequently utilized. Hypothesis revealed a weak but statistically significant positive relationship ( $R = .180$ ,  $p < .001$ ) between AI-powered library services and students' learning, constitute 3.2% of the variance in learning outcomes. The findings underscore the need for improved availability and awareness of AI tools, as well as the removal of barriers to adoption, including digital literacy gaps and infrastructure limitations. This research highlights the transformative potential of AI in education and calls for strategic interventions to maximize its benefits in tertiary institutions.

**KEYWORDS:** Artificial Intelligence, Library Services, Teaching, Learning, Technology.

## I. INTRODUCTION

Artificial Intelligence is a rapidly emerging tool that is revolutionizing higher education by providing cutting-edge resources that are improving academic activities in tertiary institutions. Artificial Intelligence's significance is enabling tailored learning experiences, and classroom instructions and enhancing library services which has garnered substantial interest in educational environments that have become more digital. According to Lo, (2023), Artificial Intelligence has also been used in education to improve academic support and administrative duties. Artificial Intelligence is projected to gradually become more deeply ingrained in higher education as it develops, providing increasingly more advanced resources that can improve student learning, and get them ready for the demands of the contemporary workforce. In modern libraries, Artificial intelligence is rapidly gaining center stage, redefining how librarians' access, process, and use information resources. Artificial intelligence technology such as machine learning algorithms, natural language processing, and data mining has improved traditional library operations such as cataloguing, resource management, and user interaction.

By exposing users to a variety of simple and efficient digital organizing techniques for library resources, Artificial Intelligence is redefining library services by making information easier to obtain and utilizing library resources for academic purposes. It enables educators and students to have access to advanced tools for research and learning. According to Hussain (2023), artificial intelligence can simplify library operations and provide practical, affordable solutions that may be used to better support educators and students. These developments have made libraries more user-friendly, and interactive environments. artificial intelligence offers a plethora of potentials for educators to improve the methods of teaching. Delivering more effective and individualized instruction has become easier for educators due to the integration of artificial intelligence into the classroom. This integration has improved instruction while likewise rendering it less difficult to identify students' areas of need and implement more targeted, adaptive teaching approach (Bubeck et al., 2023). By addressing a variety of learning demands, educators can boost student engagement and success rates with this degree of customization. Furthermore, they can concentrate on more intricate and innovative facets of instruction such as intelligent tutoring programs and automated grading systems providing them with more time (Nwosu and Kalu, 2023). Artificial Intelligence provides educators with innovative teaching strategies that include students in the classroom and promote learning. Such a strategy includes tailored learning programs and flexible content delivery that accommodates a range of student requirements and learning preferences. As evidenced by recent studies that show how it may enhance academic achievement and meet a variety of learning demands. Artificial intelligence tools like intelligent tutoring programs and adaptive learning platforms have been crucial in helping to personalize education by enabling students to study at their own pace and in accordance with their needs. The educational environment is being revolutionized by Artificial Intelligence enabled personalized education, which makes learning more effective and tailored to each student's specific needs (Pratama et al., 2023).

Personalized learning, through the creation of personalized experiences and instructional materials, enables students to learn at their own pace and preferred methods. For instance, Artificial Intelligence facilitates student learning using automated feedback methods that furnish prompt and precise input on their work, allowing them to comprehend and rectify their errors with promptitude. In addition to improving personalized learning experiences, Artificial Intelligence is also reshaping the way students interact with educational content and services. According to Maiti and Goel (2024), virtual teaching assistants can be customized to meet the unique needs of each student, resulting in more personalized learning, and can be useful instruments in inclusive education, meeting the needs of a wide range of students and increasing participation through customized learning programs (Pratama et al., 2023). Artificial Intelligence-powered platforms can facilitate continuous education. These platforms can monitor students' development over time, recommend pertinent courses, and modify content as students move up the professional ladder. Coursera is a renowned online learning platform that offers courses, specializations, and degrees. According to Gupta et al. (2024), Coursera is a platform that enhances online learning by offering personalized course suggestions and intelligent teaching tools. By providing students with impaired resources and support, Artificial Intelligence tools can close educational disparities. Learning is made more accessible by Artificial Intelligence assistive technologies like text-to-speech and speech recognition to students with disabilities. Artificial Intelligence systems are increasingly being utilized to design personalized learning experiences for students with special needs, ensuring they receive the necessary assistance (Akbarova et al., 2023). Despite the promising potential of Artificial Intelligence to enhance library services, improve teaching practices, and support student learning, its adoption and implementation in these areas remain uneven and under-researched, especially in Southwest, Nigeria. There are significant variations in the methods through which educators utilize these resources and the extent to which students integrate them. The lack of comprehensive study on the applicability of Artificial Intelligence tools in these circumstances, particularly in the unique setting of higher education institutions, exacerbates the issue of AI underutilization. This could cause Southwest Nigerian tertiary institutions to fall behind in the global shift to AI-enhanced education, which would be detrimental to librarians, educators, and students as it would prevent them from having access to modern tools and resources.

The main objective of this study is to investigate Artificial Intelligence as a tool for library services particularly learning among students in tertiary institutions at the University of Ibadan, Ibadan, Oyo State, and Ladoke Akintola University of Technology, Oyo state. Meanwhile the study seeks to

specifically identify the availability level of various tools of artificial intelligence in tertiary institution libraries in Oyo State, identify the acquaintance level of students with artificial intelligence tools in tertiary institutions in Oyo State, examine the usage rate of artificial intelligence tools, during library time by tertiary institution students in Oyo State and identify the influence of artificial intelligence-powered library services on tertiary institutions students' learning.

## II. LITERATURE REVIEW

### A. ARTIFICIAL INTELLIGENCE AS A TOOL FOR TERTIARY EDUCATION

Artificial Intelligence technologies are being utilized in a range of educational activities in tertiary institutions. These include intelligent tutoring systems, adaptive learning systems, automated assessment tools, virtual teaching assistants, enhanced inclusive education, and personalized learning platforms. These advancements are improving educational outcomes and reshaping the roles of librarians, educators, and students in the learning process. By dynamically adapting instructional content to each student's unique needs, AI-driven personalized learning paths have demonstrated a great deal of potential for enhancing retention and academic achievement by matching methods of instruction to the different characteristics of every student, this method creates a more inclusive and flexible learning environment (Sharma, Mahesh & Radhakrishnan 2023). Artificial intelligence-driven chatbots and virtual assistants provide round-the-clock assistance with school information, admission requirements, exam dates, student registration, course selection, academic advice, and tutoring. This constant availability guarantees that students may receive the assistance and information they need whenever they need it, improving the general accessibility and effectiveness of educational institutions (Patil, 2023). The potential of artificial intelligence to improve academic achievement through effective administration, effective and efficient subject delivery has led to a rapid increase its usage in tertiary institutions. Gupta et al. (2024) found that 88% of students in classrooms with Artificial intelligence augmentation reported improved learning experiences, indicating its positive impact on learning outcomes and student engagement.

### B. ARTIFICIAL INTELLIGENCE AS A TOOL FOR LIBRARY SERVICES

Libraries are progressively implementing artificial intelligence technology to enhance the efficacy and efficiency of their services. One of its key applications is Automated Cataloging and Classification. The transformative potential of artificial intelligence in library management especially in automating the cataloging and categorization provides improved services and increases satisfaction among users by increasing the effectiveness of these systems (Abdulwahid, Pattnaik, Palav, Babu, Manoharan, & Selvi, 2023). Artificial Intelligence technology is replacing traditional cataloging methods, which require time-consuming and laborious subject heading searches, with automated systems for cataloging and classifying library materials. Libraries' automated cataloging and classification systems underpinned by artificial intelligence have significantly improved productivity, accuracy, and user satisfaction (Osagie & Oladokun, 2024). The researchers discovered that these mechanisms mitigate human error, optimize workflows, and augment the conservation of library documentation. Big data analysis and classification are made possible by Artificial Intelligence technologies that use machine learning techniques, narrow processes, improve accuracy, and enhance resource discoverability. Among these artificial intelligence tools that can be utilized in libraries for cataloging and classification are CatGPT, Library of Congress, and Ex Libris. CatGPT which automates document processing. Brzustowicz (2023) averred that CatGPT can streamline the record creation process, making it easier for librarians to organize and update their records. Library of Congress creates standardized catalog records worldwide particularly in academic libraries, and Ex Libris Alma improves metadata accuracy.

Wildgaard et al. (2023) discovered that these technologies use artificial intelligence to improve the search process and expand the range of information retrieval, providing new avenues to discover literature. Resource discovery in the library can further be advanced and simplified through Intelligent search and retrieval systems. Artificial Intelligence search engines and recommendation systems simplify processes, methods, and procedures of searching, locating, and retrieving recorded data and information from a file or database in libraries. These systems in libraries include ResearchRabbit, and

Chatbots. ResearchRabbit is a based artificial intelligence application that provides graphical charts and reference networks that can help educators and students more effectively organize, analyze academic publications and help them uncover new research more quickly. According to Sharma, Gulati, Kaur, Sinhababu, and Chakravarty (2022), ResearchRabbit provides easier and more thorough literature reviews through seamless visualizations and efficient search capabilities. Chatbots are available around-the-clock in libraries to assist patrons locate resources and navigate the services needed. Panda and Chakravarty (2021) explore the practical implementation of conversational Artificial Intelligence in libraries, highlighting its role in providing continuous user support without human intervention, simulating human conversation, and offering 24/7 support, helping users navigate library resources, find information, and answer common questions. These advancements expand the range of services that libraries can provide, increasing the effectiveness of virtual reference services, accessibility, and user-friendliness.

### C. ARTIFICIAL INTELLIGENCE AS A TOOL FOR FOSTERING STUDENT LEARNING

Artificial Intelligence tools are being used in the educational setting to promote student engagement and personalize learning through key applications such as Adaptive Learning Systems (ALS). Adaptive learning systems, a subset of Artificial Intelligence tools can modify course materials to meet the unique needs of each student, improving the learning process as a whole. It assesses student performance and provides learning resources that adjust to the difficulty level of students and their learning pace, ensuring that students have a full grasp of the curriculum. Akavova et al. (2023) describe the integration of adaptive learning system with artificial intelligence algorithms, which enables real-time adjustments to content delivery based on student performance. This individualized approach is very effective in closing academic gaps among students and meeting student's unique requirements. Jiang et al. (2022) researched the application of item response theory in adaptive learning systems, emphasizing that these systems produced a considerable reduction in learning time and improved learning outcomes by approximately 15% when compared to traditional methods. Compared to conventional one-size-fits-all teaching strategies, where students who learn gradually can fall behind, this personalized approach offers a more stimulating and productive learning environment. Intelligent Tutoring Systems (ITS) mimic one-on-one interactions between students and human tutors by offering personalized education and feedback through recommendations, clarifications, and additional practice. Shi et al. (2023) created an ITS based on Artificial Intelligence large models that evaluate student data to provide personalized learning support, proving the ability of ITS to adapt to each student's individual learning needs.

These tools can assist learners with low cognitive ability in learning and assimilating course materials at their own pace. Students with disabilities access equitable education through enhanced inclusive education by providing customized support and accommodations. Speech recognition and text-to-speech programs driven by artificial intelligence help students with visual or hearing impairments by increasing the accessibility of educational content. Šumak et al. (2024) highlight that Artificial Intelligence-based educational tools, such as intelligent tutoring systems, adaptive learning platforms, and automated assessments, can significantly support inclusive education. By constant provision of specialized support resources, lifelong education can be attained. Artificial intelligence tools can support lifelong learning, which is the ongoing pursuit of information and skills throughout an individual's life. In an ever-evolving environment where information and skills must be updated regularly, these Artificial Intelligence tools provide individualized, adaptable, and accessible learning opportunities. Artificial Intelligence technologies enhance lifelong learning by providing personalized educational materials and specific information to meet individual needs upon request. Learning is a lifelong process, and in order to stay relevant, one must occasionally keep up with the latest developments in technology and industrial practices. Gulyamov et al. (2024) highlight Artificial Intelligence's role in creating platforms that support lifelong learning by adapting content to the learner's needs and professional demands, stipulating that these platforms were created to assist individuals stay updated in their fields, ensuring that their abilities remain relevant in an ever-changing job market.

#### D. THE ROLE OF ARTIFICIAL INTELLIGENCE TOOLS IN ENHANCING LIBRARY SERVICES FOR LEARNING

In tertiary institutions, libraries carry out various operations such as cataloguing and classification, information retrieval, and referencing to enhance information access and facilitate teaching and learning. Cataloging and classification are carried out in libraries to arrange and organize the holdings of libraries. These provide educators with the robust information materials required for teaching and, to constantly adapt to curricular changes. According to Tripathi (2021), properly maintained libraries that adhere to proper cataloging practices significantly improve the institution's curriculum by providing easily accessible resources, noting that this is a prerequisite for curriculum implementation since it guarantees that educators can find and use instructional materials with ease. This equips educators with a plethora of information that is required to efficiently deliver instruction. Cataloging and classification directly impact how students access and interact with educational materials. It is instrumental in providing structured access to educational resources, which is essential for personalized learning. Cataloging's organized approach makes it practicable to classify resources in a way that best suits each learner's path, enabling personalized instruction. Hertenstein (2023), indicates a need for improved training in cataloging techniques, which is essential for promoting personalized learning in a variety of educational contexts. How educational resources are organized influences how resources are accessed. From the vast array of categorized resources in the library, students with special needs easily choose those that best suit their individual needs. Deng and Skeen (2019) emphasize the need for more inclusive classification systems that consider the diverse backgrounds and abilities of learners.

Library routine services including classification methods like Dewey Decimal and Library of Congress Classification, provide structured access to information resources that educators utilize for curriculum implementation. Educators can retrieve relevant academic materials that best suit their course outlines. A study by Clarke (2021) emphasizes the importance of resource classification in helping educators access relevant teaching materials, thereby influencing curriculum design and implementation in higher education. Most libraries have incorporated technologies for information retrieval through intelligent search system. Recent research has shown that intelligent search systems assist educators by facilitating more precise information retrieval, which facilitates more productive teaching, and providing academic resources for curriculum implementation. An evaluation of the OPAC service implementation at the Polytechnic of Health Ministry of Health Jakarta III was carried out by Haryanto, Supradewi, and Rohaida (2022). According to the study, the OPAC system significantly improved the retrieval of instructional materials thereby supporting the effective implementation of the curriculum. The ease of access to information provided by OPACs allows educators to quickly locate necessary materials, facilitating a smoother integration of these resources into the curriculum, and positively impacting their teaching. They may access up-to-date information, evaluate different academic materials that are relevant, and learn a lot from these resources, making it achievable for them to deliver more effectively. Information retrieval systems assist students to easily access a greater choice of resources, supporting more effective tailored, and comprehensive learning.

By providing learners with the most relevant content according to their learning styles and cognitive capacities, the recommendation models that assist them on their educational journey are supported by the information retrieval system's accurate and effective retrieval capabilities (Ma et al., 2023). Offering precise information to students reduces the time and effort required to find specific information. There is need for a consistent and effective Information Retrieval Systems in libraries to promote inclusive education by ensuring that students of all abilities can access the necessary educational resources. Students' satisfaction with retrieved information and academic outcomes are significantly impacted by the usefulness and accessibility of library materials provided by information retrieval systems. Research indicates that the more easily accessible and easily used library resources are, the more satisfied users are which is a critical factor in fostering an inclusive learning environment (Sadueste & Masalinto, 2023). Kiambati et al. (2024) found out that creating inclusive learning environments in educational institutions requires well-designed user interfaces that work with screen readers. Higher education institutions, particularly those in developing nations, should be made aware of the need to have intelligent search systems in their libraries. These systems will not only benefit students generally but also successfully meet the needs of students with disabilities. Usenbayeva, Butabayeva, and Nurzhanova (2021) explore the development of specialized libraries for blind and



visually impaired readers. They averred that in addition to offering information access, the libraries will support the development of an inclusive culture in the educational setting by bridging the gap between generic information systems and the unique needs of visually impaired students. Personalized support such as reference services is a more direct way of assisting learners to navigate the library and access provided resources. These levels provided services to all students, especially in tertiary institutions. Reference services, which are typically connected to face-to-face contacts, have evolved to include digital technologies that improve individualized learning. For students who might not have easy access to physical libraries, these services offer real-time interactions between students and librarians who can offer recommendations on resource finding, and bibliographies for research. Dalbehera (2020) recognize the significance of these reference services in meeting students' individual needs by providing them with specialized resources that meet their unique educational requirements and learning styles.

### III. METHODOLOGY

Three research questions and one hypothesis guided this study, below are the questions developed. "What is the availability level of various tools of artificial intelligence in tertiary institutions' libraries in Oyo State? What is the acquaintance level of students with artificial intelligence tools in tertiary institutions in Oyo State? What is the usage rate of artificial intelligence tools by tertiary institution students in Oyo State?" Meanwhile a single hypothesis was developed which is "There is no significant relationship between artificial intelligence-powered library services and tertiary institutions students' learning"

#### A. THEORETICAL FRAMEWORK

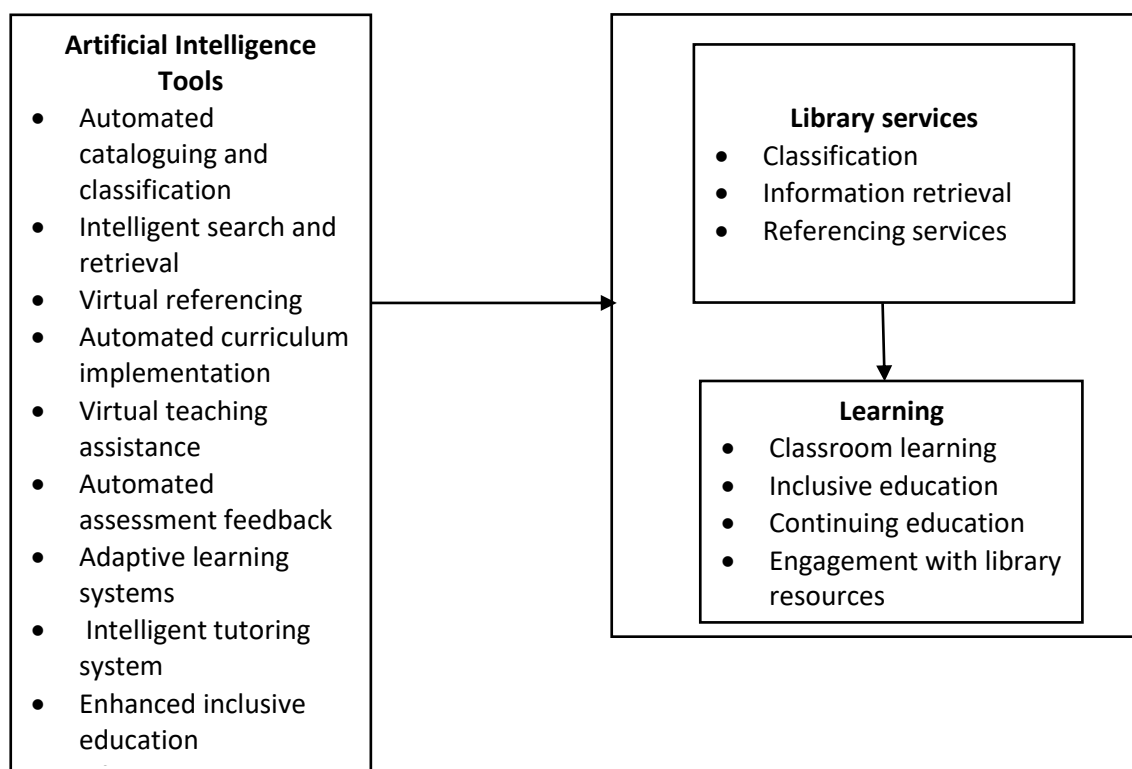
The Technology Acceptance Model (TAM), developed by Fred Davis in 1989, is a highly relevant theoretical framework for exploring the adoption of Artificial Intelligence as a tool for library services, teaching, and learning among educators and students in tertiary institutions in Nigeria. TAM posits that two main factors: perceived usefulness and perceived ease of use which influence an individual's decision to accept and use a new technology. This model effectively explains the dynamics of Artificial Intelligence in academic settings, especially in Nigerian tertiary institutions. Perceived usefulness refers to the degree to which a person believes that using a particular technology will enhance their work and job performance. The effectiveness of Artificial Intelligence in improving work and academic tasks may be perceived differently by librarians, educators, and students. Librarians and educators are more likely to adopt AI-driven library systems if they believe it can improve their daily routine and aid in curriculum delivery. Similarly, students who find Artificial Intelligence tools helpful in organizing their study materials, offering personalized learning experiences, or providing instant feedback are likely to embrace such technologies. Recent studies have shown that when educational technologies, including Artificial Intelligence, are perceived as useful, they are more readily adopted by both educators and students (Odunaya, 2024, Khan, Khan, Tan, & Loon, 2021). The researchers explained that Artificial Intelligence tools streamline administrative tasks, such as automated grading systems, have been widely adopted because they save time and reduce the workload for educators, thereby increasing their perceived usefulness.

Perceived ease of use refers to a person's belief that using a particular system would be effortless. Artificial Intelligence tools in tertiary education are more effective among librarians, educators, and students if they have intuitive interfaces and low learning curves. Users are more likely to incorporate Artificial Intelligence into their academic routines when they perceive these technologies as simple and user-friendly (Khan et al., 2021). Despite their perceived utility, complicated or difficult-to-use technologies can typically encounter resistance. Therefore, for Artificial Intelligence tools to be widely accepted and used in educational settings, their design must prioritize imperative that their design prioritizes the user experience (Odunaya, 2024). In Nigerian tertiary institutions, the TAM framework is particularly relevant due to the diverse levels of technological literacy among educators and students. Perceived usefulness and perceived ease of use can be influenced by a variety of factors, including previous acquaintance with technology, availability of institutional support, internet connectivity quality, consistent trainings and workshops, and accessibility to digital resources. Challenges such as limited access to technology, inadequate infrastructure, and a shortage of skilled personnel have

hindered its widespread adoption in Nigeria (Kasneci et al, 2023). For Nigeria to move past these obstacles and realize the full potential of AI in Nigerian education, focused policies and investments in educational technology are required. By encouraging a positive attitude regarding its incorporation into daily chores, perceived usefulness and ease of use will drastically increase the acceptance of Artificial Intelligence among librarians, educators, students.

## B. CONCEPTUAL MODEL

The conceptual model in Figure 1 shows the relationship between Artificial Intelligence and library services, teaching and learning. Artificial Intelligence tools such as automated cataloguing and classification, intelligent search and retrieval, and virtual referencing are significantly enhancing the efficiency and effectiveness of library services, particularly in the areas of cataloguing, information retrieval, and referencing. Users can locate needed resources with the aid of automated cataloging and categorization, which expedites the cataloging process, minimizes human error, and assures consistency in the classification of resources. Intelligent search systems improve information retrieval accuracy and efficiency, allowing users rapid access to the most relevant resources while virtual referencing tools give constant and accessible support to users, improving the quality and timeliness of library assistance. The model also shows how Artificial Intelligence tools such as automated curriculum implementation, virtual teaching assistance, and automated assessment and feedback influence teaching. Automated curriculum implementation systems use artificial intelligence to assist lecturers in organizing and delivering educational information efficiently by updating curricula, verifying alignment with educational standards, and minimizing administrative effort, allowing them to focus more on teaching. Virtual teaching assistants offer instant support to educators and students throughout the teaching process. It can answer students' queries, recommend related materials, and even lead parts of the course. Students can receive immediate feedback on their various class activities using automated assessment and feedback systems. These tools provide quick, objective, and detailed feedback, enhancing student learning.



**Figure 1:** Artificial Intelligence Tools for Library Services and Learning  
(Self-constructed by authors, 2024)

Furthermore, the model shows the interconnectedness of adaptive learning systems and intelligent tutoring systems in promoting personalized learning. Adaptive learning systems assess a learner's progress, abilities, and weaknesses, adjusting difficulty levels to ensure appropriate material engagement for each skill level, and intelligent tutoring systems provide personalized teaching by imitating the conversation of a human tutor. These systems offer personalized learning experiences for students with impairments through feedback, coaching, and specialized training. Artificial Intelligence tools such as speech recognition and text-to-speech can help improve inclusive education for students with disabilities. Artificial Intelligence tools can facilitate continuous education by providing personalized educational resources to students, enabling them to achieve their learning goals at their own pace. This study adopted descriptive survey research design, the total number of respondents for this study is one thousand, one hundred and thirty-one (1,131) from a total of eleven thousand, three hundred and ten (11,310) respondents. The link to the questionnaire is [zenodo.org/uploads/14521457](https://zenodo.org/uploads/14521457) Purposive sampling technique was used to select final year students of Ladoke Akintola University of Technology, Ogbomoso and University of Ibadan respondents for this study. The data collected was coded and analysed using descriptive and inferential statistics. The research questions were analysed using simple percentages, mean and standard deviation while hypothesis was tested at 0.05 level of significance, using multiple linear regression.

#### IV. RESULTS AND DISCUSSION

The results from the analysis revealed the following:

**TABLE 1:** Availability of Artificial Intelligence Tools in Libraries

Item	NA	RA	SA	FA	AA	Mean	$\beta$	Decision
Automated classification tools.	76 (6.7%)	385 (34%)	262 (23.2%)	265 (23.4%)	143 (12.6%)	3.01	1.16	Low availability
Intelligent search and retrieval tools.	154 (13.6%)	320 (28.3%)	448 (39.6%)	123 (10.9%)	86 (7.6%)	2.71	1.08	Low availability
Virtual referencing tools (e.g., chatbots).	184 (16.3%)	279 (24.7%)	342 (30.2)	224 (19.8%)	102 (9.0%)	2.81	1.19	Low availability
Adaptive learning systems integrated with library resources.	103 (9.1%)	349 (30.9%)	371 (32.8%)	148 (13.1%)	160 (14.1%)	2.92	1.17	Low availability
AI-assisted recommendation systems for academic content.	283 (25%)	281 (24.8%)	308 (19.4%)	166 (10.4%)	93 (5.8%)	2.56	1.24	Low availability

*Note: N= 1131, NA- Not available, RA - Rarely available, SA - Sometimes available, FA – Frequently available, AA - Always available, Weighted average=2.80*

It can be deduced from the table 1 above that all items are lower than the weighted average of 2.80, hence, artificial intelligence tools are not very much available for library services. From automated cataloguing to intelligent files retrievers, virtual referencing tools, adaptive learning tools and AI-assisted recommendation systems, their availability in the libraries of the chosen schools leave much to be desired.



**TABLE 2:** Acquaintance Level of Students with Artificial Intelligence Tools

Item	NA	SA	MA	WA	FA	Mean	$\beta$	Decision
Automated feedback systems for learning	53 (4.7%)	361 (31.9%)	308 (27.2%)	277 (24.5%)	132 (11.7%)	3.07	1.10	Acquainted
Intelligent tutoring systems.	106 (9.4%)	287 (25.4%)	431 (38.1%)	181 (16.0%)	126 (11.1%)	2.94	1.11	Acquainted
Virtual teaching assistants in library resources.	119 (10.5%)	328 (20.9%)	353 (31.2)	220 (19.5%)	111 (9.8%)	2.89	1.13	Not acquainted
AI-driven personalized learning tools.	69 (6.1%)	323 (28.6%)	368 (32.5%)	204 (18.0%)	167 (14.8%)	3.07	1.14	Acquainted
Inclusive learning tools (e.g., text-to-speech applications)	183 (16.2%)	311 (27.5%)	349 (30.9%)	191 (16.9%)	97 (8.6%)	2.74	1.17	Not acquainted

*Note: N= 1131, NA- Not acquainted, SA - Slightly acquainted, MA -Moderately acquainted, WA – well acquainted, FA - Fully acquainted, Weighted average=2.94.*

It can be extrapolated from table results that learners are conversant with artificial intelligent tools like automated feedback system, intelligent tutoring systems and inclusive learning tools because the weighted average is lower than the individual mean. However, learners are not acquainted with other tools like, virtual teaching assistants and AI-driven personalised tools because their individual mean scores are lower than the weighted average mean score.

**TABLE 3:** Usage Rate of Artificial Intelligence Tools during Library Time

Item	N	R	O	F	VF	Mean	$\beta$	Decision
AI-powered classification helps in accessing library materials	61 (5.4%)	368 (32.5%)	288 (25.5%)	277 (24.5%)	137 (12.1%)	3.05	1.13	High
Intelligent search engines help in retrieving academic articles	124 (11%)	299 (26.4%)	438 (38.7%)	160 (14.1%)	110 (9.7%)	2.85	1.10	Low
AI-enabled chatbots helps in library inquiries.	144 (12.7%)	311 (27.5%)	349 (30.9%)	220 (19.5%)	107 (9.5%)	2.85	1.16	Low
Adaptive learning platforms helps in personalized study.	82 (7.3%)	333 (29.4%)	372 (32.9%)	181 (16.0%)	163 (14.4%)	3.01	1.15	High
Virtual learning tools contribute to academic skill improvement.	226 (20%)	296 (26.2%)	331 (29.3%)	182 (16.1%)	96 (8.5%)	2.67	1.21	Low

*Note: N= 1131, N- Never, R - Rarely, O -Occasionally, F – Frequently, VF – Very Frequently, Weighted average=2.89.*

It can be deduced from Table 3 above that the usage rate AI-powered library tools for intelligent search engines, chatbots and virtual learning for skill improvement is low. This is because, their individual means are lower than the weighted average mean. However, the usage rate of AI-powered classification and virtual learning tools is high.

**TABLE 4:** Relationship between Artificial Intelligence-Powered Library Services and Tertiary Institutions Students' Learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.180 <sup>a</sup>	.032	.032	.701	.032	37.880	1	1129	.000

a. Predictors: (Constant), AI\_availability\_trans

**TABLE 5:** Regression Coefficient showing the Relationship between Artificial Intelligence Powered Library Services and Tertiary Institutions Students' Learning

Model	Beta	t	Sig.	VIF
(Constant)		32.953	.000	1.000
AI_availability_trans	.180	6.155		

a. Dependent Variable: AI\_LibrSer\_Learning\_Trans

Tables 4 and 5 above tested the hypothesis, it can be deduced that, the R value (.180) indicates a weak positive correlation between AI-powered library services and students' learning. Also, the R-square (.032) shows that 3.2% of the variance in students' learning can be explained by AI tools. Though the effect size is small, the relationship is however statistically significant. In the same vein, the F-statistic (37.880, significant at  $p < .001$ ) suggests that the model provides a statistically significant prediction of learning among tertiary students. This indicates that AI-powered library services have a meaningful impact on learning. Also, the variance inflation factor (1.000) shows no multi-collinearity, suggesting that AI tools are an independent and valid predictor of learning outcomes.

The findings reveal that tools such as automated cataloguing, intelligent file retrieval systems, virtual referencing tools, adaptive learning platforms, and AI-assisted recommendation systems are largely unavailable in the surveyed institutions. This limited availability aligns with the study of Chen et al., (2023) which highlight challenges such as inadequate infrastructure, insufficient funding, and the slow pace of technological adoption in developing regions. This challenge hinders students' access to efficient library services and reduce the overall quality of learning experiences. The findings of Rana et al (2023) underpins the importance of well-equipped libraries with tools to enhance academic performance. Similarly, as buttressed by Lim et al (2022), findings revealed students are less acquainted with advanced AI applications like virtual teaching assistants and AI-driven personalized tools, where individual mean scores fall below the average. This is in tandem with the stance of Park & Kim, (2022) which revealed digital literacy gap as an impediment on technology adoption in education. Also, there is underutilisation of tools such as intelligent search engines, chatbots, and virtual learning platforms for skill improvement. This agrees with the findings of Nguyen & Do, (2022) which highlighted the barriers to the adoption of AI tools. On the flip side, the usage rate of AI-powered classification tools and virtual learning systems is relatively high. Sun et al., (2023) reinforce the relevance of AI-powered classification tools on students' learning. Furthermore, findings from the hypothesis revealed a small R-square value (.032) which is indicative of the fact that while AI tools contribute to learning, other factors likely play a more substantial role. This finding is consistent with the studies which revealed the multifaceted nature of learning, influenced by socio-economic, psychological, and institutional factors beyond technological interventions (Lim et al., 2022). Despite the modest correlation, the integration of AI tools in library services serves as a catalyst for developing critical thinking skills and further promotes active and self-directed learning among students. Sun et al., (2023) revealed that AI can personalize learning pathways, making academic materials more accessible and tailored to individual needs. In conclusion, the weak correlation is a pointer to the fact that tertiary institutions need to address

challenges such as digital literacy gaps, inadequate infrastructure, and resistance to technology adoption. As opined by Rana et al., (2023) that addressing these issues can maximize the potential benefits of AI in education.

## V. CONCLUSION

While AI-powered library tools have the potential to enhance the learning experiences of students, the study finds that their influence is constrained by their low availability, low student familiarity, and irregular usage patterns. AI tools and learning have a weak connection, which implies that institutional preparation, digital literacy, and technical infrastructure affect how successful they are. Also, the following are the recommendations made; artificial Intelligence tools such as; automated classification tools, intelligence search and retrieval tools, virtual referencing tools, adaptive learning tools and AI-assisted recommendation tools should be made more available. Secondly, students should be trained on the usage of AI tools for study. They should be trained on the most efficient way for AI-powered study. This would help them to get acquainted with these tools. Finally, efforts should be made by various stakeholders to channel more funding into promoting AI-powered libraries. More funding should be channelled towards achieving this, as it would reposition tertiary institutions in Nigeria among its pairs worldwide.

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