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ARTIFICIAL INTELLIGENCE INTEGRATION AND ITS PERCEIVED IMPACT ON THE ACADEMIC DEVELOPMENT OF UNDERGRADUATE LIBRARY STUDENTS

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ABSTRACT

Artificial Intelligence (AI) in higher education is reshaping instructional methods and academic development, especially for undergraduate library students. This study investigates the perceived impact of AI tools on the academic development of library students across 11 Nigerian universities spanning four geopolitical zones. A descriptive survey design was used; data were collected from 276 respondents using questionnaires and analyzed with SPSS. Findings reveal a high level of AI awareness (95%) and usage, with tools like ChatGPT, Google Bard, and Grammarly being the most commonly used. Students primarily employ AI for research, writing, and studying, and report improvements in assignment completion speed, content quality, and comprehension of complex topics. However, concerns remain about overdependence on AI and limited use for exam preparation. Challenges hindering effective use include high data costs, poor digital skills, unreliable internet, and power supply issues. Despite these barriers, students generally hold positive attitudes toward AI's role in education. The study concludes that while AI presents significant opportunities to enhance academic development in Nigerian higher education, addressing infrastructural, educational, and ethical challenges is inevitable. Recommendations include training programs, infrastructural investment, policy development, and responsible AI integration strategies.

Keywords: Artificial Intelligence, Undergraduate, Academic development, Library Students

INTRODUCTION

The integration of Artificial Intelligence (AI) into higher education is reshaping traditional pedagogical frameworks by remodeling instructional delivery, student engagement, and academic development of undergraduate library students. AI-driven platforms adjust learning paths and provide targeted feedback (Bozkurt, 2024), such as intelligent tutoring systems, automated grading tools, generative language models, adaptive learning platforms, and educational chatbots. These are increasingly deployed to enhance learning outcomes, provide personalized instruction, and support inclusive access to education. Despite the growing interest in AI applications in higher education, little is known about how these technologies are perceived by Nigerian undergraduate library students, particularly in terms of their influence on academic development. As AI adoption expands across Nigerian universities, albeit at different rates and with varying levels of technological preparedness, there is a pressing need to understand students' experiences, usage patterns, and perceived academic benefits.

Globally, higher education institutions are leveraging these innovations to address challenges related to large class sizes, inconsistent instructional quality, and limited student support services. In the Nigerian university context, it is quite challenging for students advancing their course for academic excellence and development to grapple with overcrowded classrooms, a shortage of qualified teaching staff, and uneven access to digital infrastructure. Osuigwe (2020) also explored the potential opportunities and challenges associated with implementing AI technology in libraries located in developing countries, particularly Nigeria, in the work titled 'Artificial Intelligence: Opportunities and Challenges for Libraries in Developing Countries,". AI presents a promising avenue to mitigate educational inequalities and improve learning efficiency. The application of artificial intelligence in libraries can be viewed as a collection of cutting-edge technologies that have given libraries access to machines that can sense, comprehend, act, and learn (Oyetola, Oladokun, Maxwell, & Akor, 2023).

Artificial Intelligence is rapidly becoming an integral part of educational systems worldwide; there is a notable paucity of empirical research examining its perceived academic impact within the Nigerian higher education context. While global studies highlight AI's potential to support personalized learning, automated instructional processes, and enhance student development, the

actual influence of these tools on students, particularly from their own perspective, remains under-investigated in Nigeria.

The implementation of AI tools in Nigerian universities is marked by inconsistencies, often shaped by disparities in digital infrastructure, institutional readiness, and staff capacity. Many undergraduates may engage with AI tools such as ChatGPT, Grammarly, or QuillBot without adequate guidance or awareness of their pedagogical implications. Moreover, the majority of existing literature emphasizes administrative or instructional viewpoints, offering limited insight into students' firsthand experiences with AI in academic contexts. This study seeks to fill this critical gap in artificial intelligence integration and its perceived impact on the academic development of undergraduate library students.

Research Questions

1. To what extent are AI technologies adopted and utilized by undergraduate library students in Nigerian higher institutions?
2. How do undergraduate library students perceive the impact of AI on their academic development?
3. What challenges hinder the effective use of AI tools by undergraduate library students in Nigerian universities?

LITERATURE REVIEW

Artificial Intelligence (AI) has emerged as a force in higher education, equipping both teaching and learning experiences through automation, personalized learning, and intelligent tutoring systems (George & Wooden, 2023). In the academic context, AI refers to the simulation of human cognitive functions such as reasoning, learning, and problem-solving by computer systems (Chowdhury, 2010). AI applications such as ChatGPT, Grammarly, Coursera, and AI-based assessment tools are increasingly integrated into higher education to provide academic support and automate administrative functions. Within academic institutions, AI systems are increasingly employed to support administrative tasks, enhance teaching and learning, and provide personalized educational experiences (Holstein et al., 2019).

AI integration remains relatively nascent, constrained by infrastructural, technological, and policy-related limitations (Subaveerapandiyan & Gozali, 2024). Nonetheless, awareness and usage among undergraduates are rising, particularly with the advent of mobile-based and cloud-enabled educational platforms. Several studies have linked the use of AI tools to improvements in academic development. AI enables personalized learning experiences that adapt to individual student needs, pacing, and performance levels (Dalkir, 2013). Intelligent learning systems provide real-time feedback, access to a wide range of resources, and continuous assessment mechanisms that support knowledge retention and academic achievement (Qiu, 2024).

In the Nigerian context, concerns have been raised regarding over-dependence on AI, ethical considerations, academic dishonesty, and a potential decline in critical thinking (Olatunji-Ishola & Okanlawon, 2025). These dual perspectives underscore the need for empirical investigation, particularly within the Nigerian educational landscape. Undergraduates library students' perception of AI tools significantly influences their adoption and effective utilization. Positive perceptions are often associated with improved usability, perceived usefulness, and technological self-efficacy (Ajiferuke & Adekannbi, 2020). Conversely, negative perceptions may stem from a lack of digital skills, mistrust of AI systems, or concerns about data privacy (Menard & Bott, 2025). It is, therefore, important to assess students' attitudes, readiness, and experiences to determine how these perceptions translate into academic development.

Key challenges impeding AI integration include inadequate infrastructure, lack of training, limited funding, and resistance to change (Issa & Nwalo, 2008). Additionally, inconsistent government policies and the digital divide further hinder the effective deployment of AI in educational institutions (Aderibigbe, Ohenhen, Nwaobia, Gidiagba, & Ani, 2023). Addressing these challenges is essential for making the most of the potential of AI in Nigerian higher education.

RESEARCH METHODOLOGY

This study adopted a descriptive survey research design, which is appropriate for obtaining factual, attitudinal, and perceptual information from a defined population. The design enables the collection of quantitative data to examine undergraduates library students' perceptions of artificial intelligence (AI) on their academic development. The target population comprised 950 undergraduate 400-level library students drawn from eleven selected universities across four

geopolitical zones in Nigeria: South-West, South-East, North-West, and North-East. The universities included University of Lagos, Obafemi Awolowo University, Ekiti State University, Nnamdi Azikiwe University, University of Nigeria, Nsukka, Imo State University, Bayero University Kano, Ahmadu Bello University Zaria, Sule Lamido University, University of Maiduguri, and Adamawa State University. These institutions were purposefully selected to ensure regional representation and diversity in institutional types. The sample size was determined using Taro Yamane's (1967) formula for finite populations. Thus, the study sampled 281 undergraduate library students. A stratified random sampling technique was employed to ensure equitable representation across the four regions. Each geopolitical zone constituted a stratum, and universities were proportionally represented within each stratum. Within the selected universities, **s**imple random sampling was used to select individual respondents. A five-point Likert scale ranging from *Strongly Agree* to Disagree Strongly was used for measuring key variables related to perceptions and attitudes. Data were collected over six weeks using both physical distribution of printed questionnaires **and** online administration (via Google Forms) to accommodate students in remote areas or those engaged in online learning. Institutional permissions were obtained, and respondents were informed of the voluntary nature of their participation.

DATA ANALYSIS

Table 1: Questionnaire administration and return rate

No of Administered Questionnaires	No of Copies Returned	Percentage
281	276	98.2%

Source: Survey, 2025

Table 1 shows that a total of 281 questionnaires were administered to respondents, and out of these, 276 copies were returned, which indicates that nearly all participants responded. This results is in a response rate of 98.2%.

Research Question 1: To what extent are AI technologies adopted and utilized by undergraduate library students in Nigerian higher institutions?

Table 2: Awareness of Artificial Intelligence (AI) tools used in education

Alternatives	Responses	Percentage
Yes	262	95
No	14	5
Total	**276**	**100**

The data presented in Table 2 reveal the respondents' awareness of AI tools in educational settings. Out of a total of 276 respondents, 262 individuals (95%) indicated that they are aware of AI tools used in education. 14 individuals (5%) reported that they are not aware of such tools. However, 95% of awareness suggests that the majority of the respondents are familiar with the application of AI technologies in education.

Table 3: AI tools used by respondents

S/N	Alternatives	Responses	Percentage
1	ChatGPT	83	30
2	Grammarly	52	19
3	Google Bard	73	26
4	QuillBot	42	15
5	Coursera/EdX (AI-Powered Learning)	26	9
6	Others (Please specify):	-	-
	Total	**276**	**100**

Table 3 shows that ChatGPT was the most commonly used AI tool, with 83 respondents (30%). Google Bard was used by 73 respondents (26%), and Grammarly, an AI-powered writing assistant, was used by 52 respondents (19%). QuillBot, known for paraphrasing and summarizing, was selected by 42 respondents (15%). Coursera/EdX (AI-Powered Learning Platforms) had the lowest usage, with 26 respondents (9%). This shows a preference for generative and writing-enhancement AI tools like ChatGPT, Bard, and Grammarly, which are user-friendly and accessible.

Table 4: Purposes for using AI tools

S/N	Alternatives	Responses	Percentage
1	Writing and editing assignments	77	28
2	Research and summarization	83	30
3	Solving math/science problems	42	15
4	Language translation	30	11
5	Studying and revision	44	16
	Total	**276**	**100**

The table reveals that Research and Summarization (30%) is the most common use of AI tools among respondents, with 83 individuals indicating they use AI primarily for gathering and condensing information. Also, writing and Editing Assignments, 77 respondents (28%) reported using AI tools for writing and editing. Studying and Revision 44 respondents (16%) use AI to support studying and exam preparation and Solving Math/Science Problems 42 respondents (15%) indicated they use AI for assistance in tackling technical subjects like mathematics and science as well as Language Translation 30 respondents (11%) use AI tools for translating text between languages, suggesting a smaller but significant use case for multilingual communication or learning. The data shows that AI tools are primarily used for academic support, particularly in research, writing, and studying.

Research Question 2: How do undergraduate library students perceive the impact of AI on their academic development?

Table 5: Impact of AI on students' academic development

S/N	Statement	SA (%)	A (%)	D (%)	SD (%)
1	AI tools help me complete assignments faster	181 (66%)	69 (25%)	19 (7%)	7 (3%)
2	AI has improved the quality of my academic work	194 (70.3)	56 (20.3%)	14 (5.1%)	12 (4.4%)
3	AI tools have helped me understand complex topics better	181 (66%)	79 (28.6%)	9 (3.3%)	7 (2.5%)
4	My academic development has improved due to AI tools	72 (26.1%	98 (35.5%	49 (19%)	57 (21%

		)	)		)
5	I rely on AI tools to prepare for tests and exams	80 (29%)	66 (24%)	63 (23%)	67 (24%)

Table 5: Perception of AI's Impact on Academic Development among Undergraduate Library Students shows that 91% respondents, Strongly Agree (66%) and Agree (25%) that AI tools help them complete assignments faster. 90.6% respondents, Strongly Agree (70.3%) and Agree (20.3%) that AI has improved the quality of academic work. 94.6% respondents, Strongly Agree (66%) and Agree (28.6%) that AI tools have helped me understand complex topics better. 61.6% respondents, Strongly Agree (26.1%) and Agree (35.5%) that academic performance has improved due to AI tools. Also, 53% respondents, strongly agree (29%) and 24% agree rely on AI tools to prepare for tests and exams. This indicates that while AI tools are widely accepted as helpful study aids, their role in improving test results or overall academic development may vary by individual or use context.

Table 6: Use of AI tools on students' learning processes

S/ N	**Statement**	**SA (%)**	**A (%)**	**D (%)**	**SD (%)**
1	I find AI tools easy to use	157 (57%)	59 (21.4%)	31 (11.2%)	29 (11%)
2	I trust the information provided by AI tools.	103 (37.3%)	73 (26.4%)	52 (19%)	48 (17.4%)
3	I enjoy using AI tools for academic tasks	128 (46.4%)	72 (26.1%)	45 (16.3%)	28 (10.1%)
4	I am concerned that the overuse of AI might affect my learning ability	175 (63.4%)	72 (26.1%)	18 (7%)	11 (4%)
5	I believe AI tools are a valuable part of modern education	147 (53.2%)	53 (19.2%)	43 (16%)	33 (12%)

Table 6 reveals that 78.4% of the respondents, Strongly Agree (57%) and Agree (21.4%) agree that AI tools are easy to use. 63.7% of the respondents, strongly agree (37.3%) and 26.4% agree that they trust the information provided by AI tools. Also, 72.5% of the respondents, strongly

agree (46.4%) and 26.1% agree that they enjoy using AI tools for academic tasks. While 89.5% of the respondents, Strongly Agree (63.4%) and Agree (26.1%) are concerned that overuse of AI might affect their learning ability, and 72.4% of the respondents, Strongly Agree (53.2%) and Agree (19.2%) believe AI tools are a valuable part of modern education. The findings reveal that undergraduate library students generally have a positive attitude toward the use of AI tools in learning.

Research Question 3: What challenges hinder the effective use of AI tools by undergraduate library students in Nigerian universities?

Table 7: Challenges hindering the effective use of AI tools by undergraduate library students in Nigerian universities

S/N	Alternatives	Responses	Percentage
1	Lack of digital skills	58	21
2	Poor internet access	44	16
3	High data cost	59	21
4	Unreliable AI outputs	37	13
5	Institutional restrictions	14	5
6	Ethical concerns (e.g., plagiarism)	12	4
7	Others (please specify): Poor electricity supply_____	52	19
	Total	**276**	**100**

Table 7 addresses the challenges that undergraduate library students face in effectively using Artificial Intelligence (AI) tools within Nigerian universities. 59 (21%) respondents and 58 (21%) respectively indicate that high data cost and lack of digital skills are key challenges. Also, 52 (19%) respondents cited Poor Electricity Supply. 44 (16%) of the respondents cited Poor Internet Access. Also, 37 (13%) indicated Unreliable AI Outputs, while 14 (5%) and 12 (4%) cited Institutional Restrictions and Ethical Concerns, respectively. Together, these challenges highlight the broader digital divide affecting Nigerian students' ability to fully benefit from emerging technologies.

FINDINGS AND DISCUSSION

The results of this study reveal a high level of awareness and adoption of Artificial Intelligence (AI) tools among undergraduate students in Nigerian higher institutions. As shown in Table 2,

95% of respondents indicated familiarity with AI tools, reflecting a widespread integration of digital technologies into academic life. This trend illustrates the growing digital competence of undergraduates and their readiness to engage with AI-driven learning aids.

Table 3 highlights the most frequently used AI applications, with ChatGPT (30%), Google Bard (26%), and Grammarly (19%) being the leading tools. The prevalence of these platforms suggests a clear preference for applications that support writing, summarization, and content generation tasks central to academic success. These choices underscore the perceived utility of AI in enhancing productivity and academic communication.

Further disaggregation in Table 4 reveals that the primary applications of AI tools include research and summarization (30%), writing and editing assignments (28%), studying and revision (16%), solving discipline-specific problems (15%), and language translation (11%). These findings indicate that undergraduates are leveraging AI technologies to boost their learning efficiency, improve comprehension, and support multilingual academic engagement. The data also suggests that students view AI tools as integral aids in content development and knowledge acquisition. This is in line with Chowdhury (2010), AI simulates human cognitive functions like reasoning and problem-solving, while Dalkir (2013) supports its role in learning and knowledge retention.

These observations align with existing literature, which highlights the potential of AI and knowledge technologies to drive creativity and innovation. However, this study also suggests that students' growing reliance on AI may pose risks to critical thinking and ethical scholarship if not properly managed. This aligns with concerns raised by Olatunji-Ishola and Okanlawon (2025) and further echoed in the literature, which caution against overdependence on technology that could compromise students' analytical and reasoning skills.

As detailed in Table 5, students overwhelmingly perceive AI tools as beneficial to their academic work. Specifically, 91% of respondents (66% strongly agree, 25% agree) believe that AI tools help them complete assignments more efficiently. Similarly, 90.6% reported that these tools have improved the quality of their academic work, while 94.6% affirmed that AI tools have facilitated a better understanding of complex academic content. These findings highlight the role of AI in enhancing student productivity, academic comprehension, and overall learning outcomes. They

support Holstein et al. (2019), who noted that intelligent systems improve educational experiences by offering personalized learning, feedback, and continuous assessment.

Despite these positive indicators, student opinions about AI's direct effect on academic performance were more nuanced. Only 61.6% (strongly agree and agree) believed that AI had directly improved their academic performance, with the remaining respondents either unsure or in disagreement. Likewise, only 53% of students acknowledged relying on AI tools for exam preparation, suggesting cautious use of AI for high-stakes academic tasks. These results imply that while students value AI tools for support activities such as writing and research, their role in core academic assessment contexts remains limited or controversial, possibly due to institutional policies or concerns over academic integrity. This discrepancy reflects institutional constraints and aligns with Subaveerapandiyan and Gozali (2024), who identified infrastructural and policy-related limitations affecting AI adoption in Nigerian institutions.

Students generally expressed positive attitudes toward AI tools, as illustrated in Table 6. Approximately 78.4% of respondents found AI tools easy to use, and 72.5% reported enjoying their use in academic contexts. These figures reflect high usability and user engagement, which are critical for sustained adoption of AI in educational settings. Positive perception, as noted by Ajiferuke and Adekannbi (2020), plays a significant role in students' willingness to adopt and effectively utilize AI tools.

Trust in AI-generated content was also moderately strong, with 63.7% of respondents expressing confidence in the reliability of information produced by AI tools. However, notable concerns were raised about potential overdependence, with 89.5% of students agreeing that excessive use of AI could hinder learning development. This finding suggests a need for balance between leveraging AI for academic efficiency and maintaining essential cognitive and critical thinking skills. This echoes ethical concerns raised in the literature, including those by Olatunji-Ishola and Okanlawon (2025), emphasizing the risks of relying too heavily on automated solutions.

Encouragingly, 72.4% of students recognized AI tools as valuable assets in modern education, indicating broad acceptance of their role in shaping contemporary learning environments. This aligns with the literature indicating AI's role in transforming instructional delivery, providing access to personalized education, and automating repetitive academic tasks (George & Wooden, 2023).

Despite growing adoption, several challenges continue to impede the effective use of AI in Nigerian universities (Table 7). High data costs (21%), lack of digital skills (21%), and poor electricity supply (19%) were identified as the most prominent barriers. Other challenges include poor internet connectivity (16%), unreliable AI outputs (13%), and ethical concerns such as plagiarism (4%). These findings mirror the infrastructural and digital equity issues noted in the literature. In particular, they reflect constraints documented by Issa and Nwalo (2008) and Aderibigbe, Ohenhen, Nwaobia, Gidiagba, & Ani (2023), who emphasized the impact of infrastructural limitations and the digital divide on the deployment of emerging technologies in Nigerian higher education. These constraints reflect the infrastructural, technical, and ethical limitations confronting AI adoption in the Nigerian higher education sector.

CONCLUSION

The findings reveal a high level of awareness and growing use of AI tools such as ChatGPT, Grammarly, Google Bard, and QuillBot, primarily for writing, research, and studying purposes. Most respondents reported that these tools significantly enhance the speed and quality of academic tasks, contribute to a better understanding of complex topics, and positively influence academic performance.

However, while the majority of students demonstrated a positive perception of AI's educational benefits, the study also uncovered mixed attitudes regarding reliance on AI for exam preparation and the potential implications of overdependence. Additionally, several barriers to effective AI integration were identified, including limited digital skills, poor internet connectivity, high data costs, and concerns over the reliability and ethical implications of AI-generated content.

In conclusion, AI technologies hold substantial promise in improving academic experiences and outcomes for undergraduates in Nigerian universities. Nevertheless, the effectiveness of AI in higher education will depend on addressing infrastructural, educational, and ethical challenges to ensure balanced and meaningful integration.

RECOMMENDATIONS

The following recommendations are proposed to develop undergraduate library students' use of artificial intelligence. They are:

1. Institutions should introduce structured training programs or courses to enhance students' understanding of AI tools.
2. Government and institutional stakeholders should invest in robust digital infrastructure, subsidize internet costs, and expand broadband access.
3. Clear guidelines should be established on the appropriate use of AI in academic settings to mitigate risks related to plagiarism, misinformation, and over-reliance.
4. Educators should leverage AI tools alongside traditional teaching methods to foster active learning and improved student engagement.
5. University management should create awareness campaigns, provide access to verified AI tools, and train staff and faculty members to better support students in their use of educational technologies.

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