

Influence of Artificial Intelligence on Students' Academic Performance in Adeyemi Federal University of Education, Ondo, Nigeria

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Abstract

This study investigated the influence of Artificial Intelligence (AI) on students' academic performance in Adeyemi Federal University of Education, Ondo, Nigeria. The rapid proliferation of AI tools in higher education necessitates empirical examination of their effects on learning outcomes. A descriptive survey design was adopted with a sample of 250 undergraduate students selected through stratified random sampling. Data were collected using a structured questionnaire titled "Influence of AI on Students' Academic Performance Questionnaire" (IASAPQ) and analyzed using descriptive and inferential statistics. Findings revealed high awareness (92.8%) and usage (74.5%) of ChatGPT among students, with AI tools primarily used for research (84.3%), essay writing (79.6%), and grammar checking (70.2%). A significant positive correlation ($r = 0.342$, $p < 0.05$) was found between AI usage and academic performance. Students using AI tools frequently achieved significantly higher CGPAs (Mean = 3.34) compared to non-frequent users (Mean = 3.09). However, major challenges including unreliable internet connectivity (84.3%), high data costs (79.6%), and inadequate training (66.4%) were identified. The study concludes that AI tools positively influence academic performance when used appropriately as learning aids. Recommendations include development of institutional AI policies, infrastructure investment, and integration of AI literacy into curricula.

1. Introduction

The emergence of Artificial Intelligence (AI) has transformed nearly every area of human activity, including education. AI, defined as the simulation of human cognitive processes by computer systems, involves abilities such as learning, reasoning, problem-solving, perception, and language comprehension (Madu & Musa, 2024). Recently, Artificial Intelligence (AI) technologies have increasingly been adopted in educational institutions around the globe, revolutionizing teaching methods, learning experiences, and academic results. The incorporation of AI in higher education marks a significant shift that has the potential to fundamentally change how knowledge is delivered, accessed, and evaluated.

Globally, universities are progressively integrating AI-powered tools to improve educational delivery and boost student learning outcomes. Recent surveys indicate that about 89% of college students in the United States use AI tools like ChatGPT for homework help, with 53% depending on these technologies for writing assignments (Chavalala, 2025). These AI applications encompass intelligent tutoring systems, adaptive learning platforms, automated grading systems, and virtual teaching assistants. The potential advantages include personalized learning experiences, real-time feedback, increased accessibility, and greater student engagement.

In the African context, particularly in Nigeria, the adoption of AI in higher education is steadily gaining traction. Nigerian universities, confronted with challenges like overcrowded classrooms, insufficient teaching staff, and limited resources, are increasingly exploring AI as a viable solution to address educational gaps. Research shows that over 75% of Nigerian university students currently use AI tools mainly for grammar correction, sentence restructuring, and research assistance (Nwali & Udumukwu, 2025). This rising trend highlights the importance of thorough investigation into the impact of these technologies on academic performance.

The Adeyemi Federal University of Education in Ondo State, Nigeria, is a noteworthy example of how AI affects students' academic achievement. It was formerly known as Adeyemi College of Education, but in 2023 it became a Federal University of Education, one of Nigeria's top teacher education institutions. The university serves a student body that is increasingly using digital technologies for learning by providing a wide range of programs across multiple faculties, including Arts, Science, Education, and Social Sciences.

Even though AI tools are being quickly incorporated into educational environments, little is known about how these technologies specifically affect Nigerian university students' academic performance. Although research on AI's effects on education has started on a global scale, Nigeria offers special opportunities and challenges that call for localized study. By examining how AI influences students' academic performance at Adeyemi Federal University of Education, this study addresses this knowledge gap.

This study's goals are to: (1) assess undergraduate students' awareness and use of AI tools; (2) identify the types of AI tools frequently used for academic purposes; (3) evaluate students' perceptions of AI's influence on academic performance; (4) determine the connection between AI usage and academic achievement; and (5) identify difficulties students encounter when using AI tools.

One of the most revolutionary technologies of the twenty-first century is artificial intelligence, which drastically changes how people interact with machines and process information. AI, according to Madu and Musa (2024), is the imitation or simulation of human intelligence by machines, especially computer systems. This covers a wide range of skills, such as making decisions, identifying patterns, comprehending natural language, learning from experience, and resolving challenging issues.

The evolution of AI can be traced through several generations of development. Early AI systems, dating back to the 1950s and 1960s, were primarily rule-based systems that followed predefined instructions. The field experienced significant advancement with the development of machine learning algorithms in the 1980s and 1990s, which enabled systems to learn from data. The current era, characterized by deep learning and neural networks, has produced remarkably sophisticated AI systems capable of human-like text generation, image recognition, and complex reasoning (Holmes, Bialik & Fadel, 2022).

In educational contexts, AI applications have expanded rapidly. Zawacki-Richter et al. (2019) identified several categories of AI in education including intelligent tutoring systems, automated essay scoring, learning analytics, and educational chatbots. The emergence of generative AI tools like ChatGPT in late 2022 marked a significant milestone, democratizing access to advanced AI capabilities and sparking widespread adoption across educational institutions worldwide.

Academic performance refers to the measurable outcomes of students' educational experiences, typically expressed through grades, test scores, grade point averages, and other assessment indicators. It represents a multidimensional construct influenced by cognitive abilities, motivation, learning strategies, instructional quality, and environmental factors (Winne & Hadwin, 2021). The measurement of academic performance has evolved significantly with technological advancement, with AI introducing new dimensions to performance measurement through learning analytics.

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989). TAM posits that an individual's intention to use a technology is determined by two key beliefs: perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which a person believes that using a particular technology would enhance their performance, while perceived ease of use refers to the degree to which a person believes that using the technology would be free of effort.

The model suggests that these beliefs influence attitudes toward technology use, which in turn affect behavioral intention and actual usage. In the context of this study, TAM helps explain how students' perceptions of AI tools' usefulness and ease of use influence their adoption and usage patterns, ultimately affecting their academic performance. Venkatesh and Davis (2000) extended TAM to include social influence and facilitating conditions as additional determinants of technology acceptance.

Several empirical studies have examined AI's influence on student academic performance in various contexts. Chavalala (2025) conducted a mixed-methods study involving 300 students across South African universities. Findings revealed that AI integration significantly improved academic performance by providing personalized learning experiences, instant feedback, and adaptive study plans. Students reported increased motivation and efficiency, utilizing AI-driven platforms for time management, problem-solving, and knowledge retention.

Weeks et al. (2024) investigated the impact of generative AI usage on exam performance among university students. Surprisingly, the study found that students using AI tools scored, on average, 6.71 points lower than non-users, suggesting that improper use of AI may hinder rather than help academic outcomes. This finding highlights the importance of proper guidance in AI usage.

Baillifard et al. (2023) explored the integration of AI tutors in learning programs. Results indicated that students who actively engaged with the AI tutor achieved significantly higher grades, with average

improvements of up to 15 percentile points compared to parallel courses without AI tutors. This suggests that AI tutors can effectively enhance academic performance when properly integrated into learning programs.

In the Nigerian context, Nwali and Udumukwu (2025) investigated AI adoption among academics in Nigerian universities. The study found a moderate adoption rate of 62.12%, with grammar and writing assistance tools being most popular. While 88% of respondents perceived AI tools as highly useful, only 25% reported having the necessary facilitating conditions to use them effectively, highlighting infrastructure challenges.

Adigwe et al. (2023) examined AI awareness among medical students and lecturers in Nigeria. The study found that both groups had favorable attitudes toward AI, with median attitude scores of 6.89 for students and 6.67 for lecturers on a 10-point scale. Grammar checkers (62.3%) were the most commonly reported AI tools used, while ChatGPT (43.6%) was the most frequently mentioned dedicated AI tool.

Yaseen et al. (2025) investigated the impact of adaptive learning technologies, personalized feedback, and interactive AI tools on student engagement. The research found that these technologies significantly improved student engagement, with digital literacy moderating the effectiveness of adaptive learning tools. Students with higher digital literacy levels benefited more from AI-powered educational technologies.

2. Method

2.1. Research Design

This study adopted a descriptive survey research design. The descriptive survey design was considered appropriate because it allows for the collection of data from a representative sample to describe existing phenomena, attitudes, or conditions (Saunders, Lewis & Thornhill, 2019). This design enables the researcher to gather comprehensive information about students' awareness, usage patterns, and perceptions of AI tools and their influence on academic performance.

2.2. Population and Sample

The target population for this study comprised all undergraduate students of Adeyemi Federal University of Education, Ondo. The university has a student population of approximately 15,000 across various faculties. A sample of 250 undergraduate students was selected using stratified random sampling technique to ensure representation across different faculties, levels of study, and gender.

2.3. Research Instrument

Data were collected using a structured questionnaire titled "Influence of AI on Students' Academic Performance Questionnaire" (IASAPQ). The questionnaire was developed by the researcher based on extensive review of literature and comprised four sections: Section A collected demographic information; Section B measured awareness and usage of AI tools; Section C contained 20 Likert-scale items measuring perceptions of AI influence; and Section D collected data on challenges faced.

2.4. Validity and Reliability

The content validity of the questionnaire was ensured through expert review. Three lecturers in the Department of Educational Foundations examined the instrument for clarity, relevance, and comprehensiveness. The reliability of the instrument was established using Cronbach's alpha coefficient. A pilot study with 30 students yielded a reliability coefficient of 0.84, indicating good internal consistency.

2.5. Data Analysis

Data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to answer research questions. Inferential statistics including Pearson Product Moment Correlation and Independent t-test were used to test hypotheses at 0.05 level of significance. All analyses were conducted using SPSS version 26.

3. Results and Discussion

3.1. Results (Mandatory)

3.1.1. Demographic Characteristics

Table 1 presents the demographic characteristics of the 235 respondents who participated in the study. The majority were female (54.0%), aged 21-23 years (47.7%), and distributed across all faculties with Education having the highest representation (23.8%). Most respondents had CGPAs in the Second Class range (89.4%).

Table 1. Demographic Characteristics of Respondents (N=235)

Variable	Category	Frequency	Percentage
Gender	Male	108	46.0
	Female	127	54.0
Age	18-20 years	65	27.7
	21-23 years	112	47.7
	24-26 years	45	19.1
	27+ years	13	5.5
Faculty	Arts	47	20.0
	Science	48	20.4
	Education	56	23.8
	Social Sciences	47	20.0
	Vocational & Technical	37	15.7

3.1.2. Awareness and Usage of AI Tools

Table 2 presents data on students' awareness and usage of AI tools. The findings indicate high awareness of AI tools among students, with ChatGPT having the highest awareness (92.8%) and regular usage (74.5%). Grammarly also showed high awareness (84.3%) and usage (60.4%).

Table 2. Awareness and Usage of AI Tools

AI Tool	Aware (%)	Use Regularly (%)
ChatGPT	92.8	74.5
Google Gemini	66.4	37.9
Grammarly	84.3	60.4
QuillBot	52.8	33.2
Claude AI	37.0	17.9
Microsoft Copilot	40.4	20.4
Turnitin	60.4	28.9

3.1.3. Purposes of AI Use

Students primarily use AI tools for research and information gathering (84.3%), essay and assignment writing (79.6%), and grammar and proofreading (70.2%). This pattern indicates that AI tools are mainly employed to support traditional academic tasks.

Table 3. Purposes of AI Tool Usage

Purpose	Frequency (%)	Purpose	Frequency (%)
Research	84.3	Exam preparation	52.8
Essay writing	79.6	Citation/referencing	41.7
Grammar checking	70.2	Data analysis	19.1
Concept understanding	66.4	Presentations	32.3
Brainstorming	60.4	Language learning	37.9

3.1.4. Students' Perceptions of AI Influence

Table 4 presents students' perceptions of AI influence on various aspects of academic performance. Students generally have positive perceptions, with the highest mean scores for completing assignments faster (4.28), improving written work quality (4.15), and enhancing research capabilities (4.05).

Table 4. Students' Perceptions of AI Influence (Scale: 1-5)

Statement	Mean	Std. Dev.	Interpretation
AI helps complete assignments faster	4.28	0.72	Agree
AI improves quality of written work	4.15	0.81	Agree
AI enhances research capabilities	4.05	0.76	Agree

AI helps understand difficult concepts	3.92	0.89	Agree
AI improves time management	3.78	0.94	Agree
AI helps achieve better grades	3.68	0.92	Agree
Overall, AI positively impacts performance	4.02	0.78	Agree

3.1.5. AI Usage and Academic Performance

Table 5 presents the relationship between frequency of AI usage and academic performance (CGPA). The data reveal a positive relationship between AI usage frequency and academic performance.

Table 5. AI Usage Frequency and Academic Performance

AI Usage Frequency	N	Mean CGPA	Std. Dev.
Daily users	68	3.42	0.48
Weekly users	89	3.28	0.52
Monthly users	48	3.15	0.58
Rarely/Never use	30	2.98	0.64

3.1.6. Hypothesis Testing

Hypothesis 1 tested the relationship between AI tool usage and academic performance. Pearson correlation analysis revealed a significant positive correlation ($r = 0.342$, $p = 0.000 < 0.05$). Therefore, the null hypothesis was rejected, indicating a significant positive relationship between AI usage and academic performance.

Hypothesis 2 compared academic performance between frequent and non-frequent AI users. Independent t-test results showed a statistically significant difference ($t = 3.245$, $p = 0.001 < 0.05$), with frequent users (Mean = 3.34) performing significantly better than non-frequent users (Mean = 3.09).

3.1.7. Challenges Faced

Table 6 presents the challenges students face when using AI tools. The most significant challenges were unreliable internet connectivity (84.3%), high cost of data (79.6%), and lack of adequate training (66.4%).

Table 6. Challenges Faced by Students in Using AI Tools

Challenge	Frequency (%)	Challenge	Frequency (%)
Unreliable internet	84.3	Lack of institutional guidelines	52.8
High data costs	79.6	AI accuracy concerns	37.9
Inadequate training	66.4	Limited device access	32.3
Plagiarism concerns	60.4	Language barriers	19.1
Premium feature costs	57.0	Information overload	41.7

3.2. Discussion (Mandatory)

This study investigated the influence of Artificial Intelligence on students' academic performance in Adeyemi Federal University of Education, Ondo. The findings revealed high awareness (92.8%) and usage (74.5%) of ChatGPT among students, aligning with global trends reported by Chavalala (2025). The high awareness levels suggest that Nigerian students are keeping pace with global technological trends despite infrastructure challenges.

Grammarly also showed high awareness (84.3%) and usage (60.4%), consistent with findings by Adigwe et al. (2023) who reported that grammar checkers were the most commonly used AI tools among Nigerian medical students. This pattern suggests that students prioritize tools that directly address their immediate academic needs, particularly writing assistance.

The significant positive correlation ($r = 0.342$, $p < 0.05$) between AI usage and academic performance supports the hypothesis that appropriate AI use enhances learning outcomes. This finding is consistent with Chavalala (2025), who reported that AI integration significantly improved academic performance by providing personalized learning experiences and adaptive study plans.

The significant difference in academic performance between frequent AI users (Mean CGPA = 3.34) and non-frequent users (Mean CGPA = 3.09) further supports the positive influence of AI on academic achievement. However, it is important to note that correlation does not imply causation. Students with higher academic performance may be more likely to adopt and effectively use AI tools, or there may be other confounding variables.

The finding contradicts Weeks et al. (2024), who reported that students using generative AI tools scored lower than non-users. This discrepancy may be explained by differences in how AI tools are used. The present study found that students at Adeyemi Federal University primarily use AI as a learning aid rather than a replacement for independent work, which may explain the positive association with academic performance.

The most significant challenges identified were unreliable internet connectivity (84.3%), high cost of data (79.6%), and lack of adequate training (66.4%). These findings corroborate previous studies on AI adoption in Nigerian higher education. Mahuta and Abubakar (2025) identified inadequate digital infrastructure as a primary barrier to AI adoption in Nigerian universities.

The high cost of data is particularly significant in the Nigerian context where internet access remains expensive relative to average income levels. This finding supports Ogunlade et al.'s (2024) observation that rural universities often lag behind in technology adoption due to poor internet access and limited financial resources.

The lack of institutional guidelines on AI use (52.8%) highlights a policy gap that needs urgent attention. Nwali and Udumukwu (2025) similarly reported that 90% of Nigerian academics lamented the absence of institutional policies on AI use. This policy vacuum creates uncertainty about appropriate AI usage and may contribute to academic integrity concerns.

4. Conclusion and Recommendation

This study investigated the influence of Artificial Intelligence on students' academic performance in Adeyemi Federal University of Education, Ondo. The findings revealed that AI tools have become integral to the academic experience of students, with high awareness and usage rates across the student population. When used appropriately as learning aids, AI tools have a significant positive influence on students' academic performance.

Based on the findings, the following recommendations are made:

University administrators should develop and implement clear institutional policies and guidelines on the ethical use of AI tools in academic work. These guidelines should define acceptable and unacceptable uses of AI, provide examples, and specify consequences for academic misconduct involving AI.

Investment in technological infrastructure is essential to improve internet connectivity and reduce the cost of access for students. This could include expanding campus Wi-Fi coverage, providing subsidized data plans, and establishing computer laboratories with reliable internet access.

AI literacy programs should be established to train students on effective and responsible use of AI tools. These programs should cover both technical skills and ethical considerations. Additionally, AI education should be integrated into the curriculum to ensure all students develop competencies in using AI tools appropriately.

Lecturers should adapt teaching methodologies and assessment strategies to account for AI tool availability. This may include emphasizing process-oriented assessments, in-class evaluations, and assignments that require critical thinking beyond AI capabilities.

Students should use AI tools as learning aids rather than replacements for independent thinking and effort. AI should complement, not substitute for, genuine learning. Students should also develop critical evaluation skills to assess AI-generated content for accuracy, relevance, and appropriateness.

For future research, longitudinal studies tracking students' AI usage and academic performance over multiple semesters would help establish causal relationships. Comparative studies examining AI adoption across different types of Nigerian universities would also provide valuable insights.

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The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

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