

INFLUENCE OF ARTIFICIAL INTELLIGENCE ON ACADEMIC PERFORMANCE OF STUDENTS IN PRIVATE SECONDARY SCHOOL IN IKWO LOCAL GOVERNMENT AREA OF EBOYI STATE

BY

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ABSTRACT

The study examined the influence of Artificial Intelligence (AI) on the academic performance of students in private secondary schools in Ikwo Local Government Area of Ebonyi State. The study was guided by three objectives: to assess the level of awareness and adoption of AI technologies and tools, examine the potentials and barriers to the adoption and integration of AI, and evaluate the impact of AI-based learning technologies on students' academic performance. A descriptive survey design was adopted, targeting students in private secondary schools, with data collected using a structured questionnaire and analyzed using mean and standard deviation. Findings revealed that students demonstrate a high level of awareness and adoption of AI technologies, particularly due to encouragement from teachers and peers (mean = 4.28). The study also found that AI tools have strong potential to enhance understanding of difficult subjects, although barriers such as poor internet connectivity (mean = 4.18) and inadequate teacher guidance hinder effective utilization. Furthermore, AI-based learning technologies were found to positively influence academic performance by improving assignment completion (mean = 4.10), increasing engagement, and enhancing test and examination outcomes. The study concluded that AI is a valuable tool for improving students' academic performance when properly integrated into the learning process. It was recommended that schools should strengthen guidance on AI usage, improve technological infrastructure, and integrate AI tools into teaching and learning practices to maximize educational benefits.

INTRODUCTION

Background of the Study

In recent years, Artificial Intelligence (AI) has increasingly gained relevance in various educational settings, revolutionized how teachers facilitate learning and the way students engage with content. The adoption of AI technologies and tools in education have the potential to transform the teaching and learning process by offering personalized learning experiences and efficient solutions to improve academic performance of students.

Despite the growing interest, adoption, integration, and application of AI in education globally, its use in private secondary schools in Nigeria, particularly in Ikwo metropolis, remains underexplored. Thus, this study aims to investigate the influence of AI on the academic performance of students in private secondary schools in Ebonyi State. Specifically, it will examine the level of awareness, how AI technologies and tools are adopted and

integrated into teaching practices, the preparedness of teachers on using these technologies, and the influence of AI on students' academic performance.

The study will also explore the factors hindering AI adoption and integration in these schools such as, limited awareness, paucity of finance, inadequate infrastructure, shortage of trained personnel, and Inequality of access to AI devices. By shedding light on the potentials and challenges of AI in education, this research will contribute to the broader discourse on leveraging technology to enhance the academic performance of students in Nigeria and other developing nations.

Statement of the problem

The rapid rise of Artificial Intelligence (AI) in education has transformed teaching and learning, offering tools that can enhance academic performance and personalized learning. However, in private secondary schools in Ikwo Local Government Area, Ebonyi State, there is limited evidence on how AI usage impacts students' academic outcomes. While some students use AI responsibly to support learning, others may rely on it excessively, risking academic dishonesty, reduced critical thinking, and superficial learning. This knowledge gap leaves educators and policymakers without sufficient guidance to effectively integrate AI into instruction, highlighting the need for research on its influence on students' academic performance.

Objective of the Study

The broad objective of the study was to examine the influence of Artificial Intelligence (AI) on the academic performance of students in private secondary schools in Ikwo metropolis, Ebonyi State.

Specific Objectives

1. To assess the level of awareness and adoption of AI technologies and tools in enhancing the academic performance of students in private secondary schools in Ikwo metropolis.
2. To examine the potentials and barriers of adoption and integration of AI in private secondary schools in Ikwo metropolis.
3. To evaluate the impact of AI-based learning technologies and tools on the academic performance of students in private secondary schools in Ikwo metropolis.

Research Questions

1. What is the level of awareness and adoption of AI technologies in private secondary schools in Ikwo metropolis?

2. What are the potentials and the barriers of adoption and integration of AI in private secondary schools in Ikwo metropolis?
3. What is the impact of AI-based learning technologies and tools on the academic performance of students in private secondary schools in Ikwo metropolis?

Research Hypothesis

Two null hypothesis were formulated and tested at 0.05 level of significance

1. H_{01} : There is no significant relationship between awareness of AI and its adoption in private secondary schools in Ikwo metropolis.
2. H_{02} : There is no significant relationship between use of AI tools and students' academic performance in private secondary schools in Ikwo metropolis.

Significance of the Study

This study on the influence of AI on academic performance of students in private secondary schools in Ikwo metropolis, will contribute to the growing body of knowledge regarding the adoption and integration of AI in educational setting by providing valuable insights into how AI influences academic performance, the factors that affect its adoption and its effective use in the classroom.

The findings of this study will be of significance to the following groups:

Educators: From the findings of this study educators will understand how AI can enhance curriculum delivery, improve student engagement, and provide personalized learning experiences. It will also emphasize the need for continuous professional development to equip educators with skills necessary for using AI technologies and tools effectively.

Teachers: Teachers will be furnished with the understanding of how AI can be a valuable teaching resource, helping them tailor instruction to meet the educational needs of individual students. The study will further provide insights into training opportunities that can enhance teachers' proficiency in using AI technologies and tools.

Students: The study will highlight how AI technologies and tools can improve students' learning experience; make learning more interactive and personalized to enhance academic performance. Through the identification of effective AI technologies and tools, the study will help students achieve better learning outcomes and prepare them for academic exploits in the 21st. Century technology-driven world.

Scope of the Study

This study focuses on assessing the influence of AI on academic performance of students in private secondary schools within Abakaliki metropolis, the capital city of Ebonyi State, Nigeria.

Geographically, the research is limited to Ikwo Local Government Area, a key urban area in Ebonyi State due to high concentration of private secondary schools that serve a diverse population of students. Ikwo was selected because of availability of critical infrastructure needed for integration and adoption of AI such as, electricity and internet services. The other reasons are its growing exposure to technology in education and its significance as an educational hub within the state (Atsuwe et al., 2018).

The target population includes the following groups within private secondary schools in Ikwo:

- Students of various grades in private secondary schools, whose academic performance will be assessed to determine the impact of AI tools on their learning outcomes.
- Teachers/ educators responsible for integrating and adopting AI tools in teaching, whose awareness, preparedness, and attitudes toward AI adoption will be evaluated.
- School Administrators, that is, principals and other decision-makers in private schools, whose perspectives on AI integration and resource allocation will be explored.

The study will primarily focus on the integration and impact of AI technologies in teaching and learning process. It will also examine how AI tools such as intelligent tutoring systems, adaptive learning platforms, and data analytics tools are used in educational process, particularly in relation to students' academic performance.

The study will explore the level of awareness, access, adoption and integration of AI technologies by educators in private secondary schools in Ikwo metropolis and conduct investigation into how AI technologies and tools influence students' academic outcomes, including grades, test scores, and overall learning effectiveness.

The barriers to AI integration and adoption such as infrastructure, finances, personnel, inequality of access that impedes AI adoption in schools will be identified and examined. The study will further, assess how well teachers are prepared to use AI tools effectively in the classroom through training and professional development.

The study will exclude public secondary schools, higher educational institutions, and private secondary schools outside of Ikwo metropolis and will not cover all possible AI tools, but will focus on those that are currently used for educational purposes in the selected private secondary schools.

This clearly defined scope will allow for a focused study on AI's influence on academic performance of students in private secondary schools in Ikwo metropolis, while taking into

account the challenges and opportunities to provide detailed and context-specific insights into how AI is shaping education within this particular setting.

METHODOLOGY

Research Design

This study will adopt a descriptive survey research design. The descriptive survey design is appropriate because it enables the systematic collection of data from a defined population in order to describe and analyze existing conditions, experiences, and relationships as they occur naturally, without manipulation of variables. In the context of this study, the design is suitable for examining the impact of family displacement on the psycho-social well-being of students in Ikwo Local Government Area, Ebonyi State.

Area of the Study

The area of the study is Ikwo Local Government Area. Ikwo Local Government Area is one of the Local Government in Ebonyi State. Ebonyi State is found in the South-Eastern Geopolitical Zone of Nigeria. The State is bounded in the North, South, East and West by Cross River, Enugu, Abia and Imo State respectively. Ikwo Local Government Area, which is the area of the study has about 54 private secondary schools and numerous public secondary schools.

Population of the Study

The target population for this study comprised all the six hundred and thirty eight (638) Private Secondary school students in Ikwo Local Government Area of Ebonyi State. Out of this, the sample of study was drawn.

Sample Size and Sampling Technique

The study will use a combination of purposive and simple random sampling techniques to select participants. Purposive sampling will be employed to identify students that have Artificial Intelligence (AI) experience in Ikwo Local Government. Within these students, simple random sampling will be used to select students to participate in the study, ensuring that each eligible student has an equal chance of selection.

To determine the sample size, the study will use Yamane's (1967) formula for finite populations:

$$n = \frac{N}{1 + N(e)^2}$$

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Where:

n = sample size

N = population size

e = level of precision (0.05 for 95% confidence level)

Instrument for Data Collection

The instrument for data collection in this study will be a structured questionnaire titled **“Influence of Artificial Intelligence on Academic Performance Of Students In Private Secondary School in Ikwo Local Government Area Of Ebonyi State**. The questionnaire is designed to collect data on the Influence of Artificial Intelligence on Academic Performance Of Students In Private Secondary School in Ikwo Local Government Area Of Ebonyi State, directly reflecting the objectives of the study.

The questionnaire will be divided into five sections corresponding to the study objectives:

Section A: Demographic Information

This section will collect information on respondents’ age, gender, and level of education

Section B: Educational Adjustment

This section will evaluate the influence of Artificial Intelligence on Academic Performance Of Students In Private Secondary School.

Validation of the Instrument

The questionnaire will undergo both content and face validation by experts in the department of Arts and Social Science Education of Ebonyi State University, Abakaliki, who will review the questionnaire items to ensure they adequately reflect the study objectives.

Reliability of the Instrument

Determine the reliability of the instrument, split half and Kuder - Richardson 20 (K-20) statistics were used to determine their reliability coefficients.

Method of Data Collection

The researcher administered the questionnaire instrument using Direct Delivery Technique (DDT) with the help of three well trained research assistants, one each from the three areas that make up the Ikwo Local Government Area in the State. Each research assistant covered his or her own area. The direct method of questionnaire administration was adopted in the

distribution of the instrument. The researcher and the assistants visited the respondents in their schools and administered the instrument on them. They waited for the respondents to respond to instrument before collecting it back on the spot. The direct method was adopted in the data collection to minimize the loss of the instrument. The research assistants were instructed on how to distribute and collect copies of the instrument from the respondents and thereafter hand them over to the researcher for analysis.

Method Data Analysis

The data collected from the questionnaire will be analyzed using descriptive statistics, specifically mean and standard deviation, to address the study objectives. Each item on the questionnaire will be scored using the 4-point Likert scale, with values ranging from 1 (Strongly Disagree) to 4 (Strongly Agree).

A benchmark mean of 2.50 will be used to interpret responses:

Items with a mean score greater than 2.50 will be interpreted as Agree while Items with a mean score less than 2.50 will be interpreted as Disagree as the decision rule.

RESULT AND DISCUSSION

RESULT

Table 1: mean and standard deviation on level of awareness and adoption of AI technologies and tools in enhancing the academic performance of students in private secondary schools in Ikwo metropolis

S/N	Questionnaire Item	MEAN	STD	REMARK
1	I am aware of various AI tools that can help in learning	3.34	1.38	Accepted
2	I know how to use AI tools to complete assignments and projects.	3.83	1.12	Accepted
3	I regularly adopt AI technologies to support my studies.	3.8	1.07	Accepted
4	I use AI-based learning apps to revise subjects before exams.	3.7	1.18	Accepted
5	I am confident in navigating AI tools without assistance.	3.79	1.37	Accepted
6	I have been encouraged by teachers or peers to use AI for learning.	4.28	0.96	Accepted
7	I am aware of AI applications that provide solutions to academic problems.	4.03	1.12	Accepted
8	I often explore new AI technologies to improve my learning.	3.98	1.05	Accepted
9	I integrate AI tools into my daily study routine.	3.67	1.27	Accepted
10	I believe AI adoption can enhance my academic performance.	4.02	1.22	Accepted
Grand mean		3.84	1.17	Accepted

The result in Table 1 showed the mean and standard deviation on the level of awareness and adoption of AI technologies and tools in enhancing the academic performance of students in private secondary schools in Ikwo metropolis. The findings indicate that encouragement from teachers or peers to use AI (4.28), awareness of AI applications that provide solutions to academic problems (4.03), and the belief that AI adoption can enhance academic performance (4.02) were the most highly rated indicators. Other items such as knowing how to use AI tools to complete assignments (3.83), regular adoption of AI technologies to support studies (3.80), confidence in navigating AI tools without assistance (3.79), using AI-based learning apps for revision (3.70), integrating AI tools into daily study routines (3.67), exploring new AI technologies to improve learning (3.98), and general awareness of various AI tools (3.34) were also accepted.

Table 2: mean and standard deviation on potentials and barriers of adoption and integration of AI in private secondary schools in Ikwo metropolis

S/N	Questionnaire Item	MEAN	STD	REMARK
1	AI tools have the potential to improve understanding of difficult subjects	3.96	0.99	Accepted
2	Access to smartphones, computers, and the internet encourages AI use in learning	3.92	1.00	Accepted
3	AI can reduce the time needed to complete assignments effectively	3.86	1.01	Accepted
4	Technical issues, such as poor internet connectivity, limit AI adoption			
5	Some AI tools are too complex for students to use effectively	3.86	1.07	Accepted
6	High costs of certain AI tools hinder their adoption in schools			
7	Technical issues, such as poor internet connectivity, limit AI adoption	4.18	1.05	Accepted
8	Teachers' lack of guidance affects the effective use of AI in learning.	4.18	1.08	Accepted
9	AI has the potential to improve students' critical thinking skills if used properly	4.14	1.15	Accepted
10	Over-dependence on AI may reduce students' independent learning ability.	3.96	0.99	Accepted
	Grand mean	3.92	1.12	Accepted

The result in Table 2 showed the mean and standard deviation on potentials and barriers of adoption and integration of AI in private secondary schools in Ikwo metropolis. The findings indicate that technical issues, such as poor internet connectivity (4.18), teachers' lack of guidance affecting AI use (4.18), and AI's potential to improve students' critical thinking skills if used properly (4.14) were the most highly rated. Other items such as AI tools' potential to improve understanding of difficult subjects (3.96), over-dependence on AI reducing independent learning (3.96), access to smartphones, computers, and the internet encouraging AI use (3.92), reduction in time needed to complete assignments (3.86), and complexity of some AI tools (3.86) were also accepted.

Table 2: mean and standard deviation on impact of AI-based learning technologies and tools on the academic performance of students in private secondary schools in Ikwo metropolis

S/N	Questionnaire Item	MEAN	STD	REMARK
1	AI-based learning tools improve understanding of academic subjects.	4.03	1.12	Accepted
2	Use of AI technologies enhances completion of assignments efficiently.	4.10	1.06	Accepted
3	AI adoption positively influences students' test and examination scores.	4.06	1.09	Accepted
4	AI learning platforms increase student engagement during lessons.	3.99	1.18	Accepted
5	AI tools support development of critical thinking and problem-solving skills.	3.89	1.05	Accepted
6	AI resources facilitate better retention and recall of academic information.	3.90	1.18	Accepted
7	Excessive reliance on AI may reduce independent learning and cognitive effort.	3.88	1.21	Accepted
8	AI integration in learning contributes to improved academic performance.	3.77	1.08	Accepted
9	AI-assisted learning motivates consistent study and participation.	3.69	1.15	Accepted
10	AI technologies complement traditional teaching methods to enhance learning outcomes.	3.90	1.19	Accepted
	Grand mean	3.92	1.13	Accepted

The result in Table 3 showed the mean and standard deviation on the impact of AI-based learning technologies and tools on the academic performance of students in private secondary schools in Ikwo metropolis. The findings indicate that use of AI technologies enhancing completion of assignments efficiently (4.10), AI-based learning tools improving understanding of academic subjects (4.03), and AI adoption positively influencing test and examination scores (4.06) were the most highly rated impacts. Other items such as AI learning platforms increasing student engagement (3.99), AI tools supporting critical thinking and problem-solving (3.89), AI resources facilitating retention and recall (3.90), excessive reliance on AI potentially reducing independent learning (3.88), AI integration contributing to improved performance (3.77), AI-assisted learning motivating consistent study (3.69), and AI complementing traditional teaching methods (3.90) were also accepted.

Discussion of Findings

Level of awareness and adoption of AI technologies and tools in enhancing academic performance of students

The result on the level of awareness and adoption of AI technologies showed that students have been encouraged by teachers or peers to use AI for learning (4.28), which aligns with the position of Ogunlade and Adebayo (2021), who observed that social influence and guidance from educators significantly enhance technology adoption among students. The finding that students are aware of AI applications that provide solutions to academic problems (4.03) agrees with Ekanem and Udoh (2022), who reported that awareness of educational technologies positively influences students' ability to integrate them into study routines and improve learning outcomes.

Potentials and barriers of adoption and integration of AI in private secondary schools

The result on potentials and barriers of AI adoption showed that technical issues, such as poor internet connectivity, limit AI adoption (4.18), which supports the findings of Adekunle and Oladipo (2022), who noted that infrastructural challenges significantly restrict the effective use of digital learning tools in schools. The finding that teachers' lack of guidance affects the effective use of AI in learning (4.18) aligns with Onuoha and Eze (2022), who emphasized that insufficient instructional support reduces students' ability to maximize the benefits of technology-assisted learning.

Impact of AI-based learning technologies and tools on academic performance of students

The result on the impact of AI-based learning technologies showed that the use of AI technologies enhances completion of assignments efficiently (4.10), which agrees with Chukwu and Nnaji (2023), who established that digital learning tools improve task efficiency and reduce cognitive load among students. The finding that AI adoption positively influences students' test and examination scores (4.06) is in line with Ogunbiyi and Lawal (2020), who reported that integration of AI tools in learning supports improved academic achievement and performance outcomes.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study on the influence of Artificial Intelligence (AI) on the academic performance of students in private secondary schools in Ikwo metropolis revealed that students are generally aware of AI tools and regularly adopt them to support their learning, with teacher and peer encouragement playing a significant role. The findings further indicate that AI technologies

possess strong potential to enhance learning outcomes; however, barriers such as poor internet connectivity and limited teacher guidance can hinder effective integration. Importantly, the use of AI-based learning tools positively impacts academic performance by improving understanding of subjects, enhancing assignment completion, and supporting better test and examination outcomes. Overall, AI adoption in education demonstrates a promising avenue for improving student learning, provided that infrastructural and instructional challenges are addressed.

Recommendations

1. Schools should continue to encourage and provide structured guidance on the use of AI tools for learning, as teacher and peer support significantly enhances students' awareness and adoption
2. Educational stakeholders should prioritize improving internet connectivity and technical infrastructure in schools to reduce barriers to effective AI adoption.
3. Schools should integrate AI-based learning technologies into the curriculum and encourage their use for assignments and test preparation, as these tools positively influence students' academic outcomes.

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