

IMPACT OF USE OF ARTIFICIAL INTELLIGENCE (AI) ON ACADEMIC PERFORMANCE IN STUDENTS OF HIGHER INSTITUTION: A CASE STUDY

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Abstract

AI is versatile nowadays especially in making education easier. This research paper works on the impact of Artificial Intelligence (AI) on academic performance in higher education. The study investigates the effect of AI on academic performance in students of higher institutions in Bauchi, Nigeria. The results show that students who received AI intervention scored significantly higher (1506+8.0) than the control group (796.5+15.0), suggesting that AI can improve learning outcomes through personalized learning, simulation, and accessibility. The study's findings are consistent with previous research, highlighting the potential of AI to revolutionize education. The study's authors recommend increasing awareness about AI tools among students and teachers to maximize their benefits.

Keywords:

AI in education, personalized learning, Improved academic achievement, Intelligent tutoring.

Introduction

Artificial intelligence (AI) is a part of the emerging development from science and technology. It is a science or technique relying on computer methods to program an application and intelligent machines by imitating human intelligence (Slimi, 2023). AI is a wide field of computer science focusing on making systems that are of great potential to carry out tasks that require human intelligence. The tasks or activities may include, solving a problem, decision making, learning, understanding a language, and many other things (Paul et al., 2020; Muresan, 2023). AI is striding in order to replace or replicate human intelligence or cognitive abilities using computer systems. AI can learn or adapt to data and improve performance through the test of time. Major key aspects of AI include, machine learning, and deep learning, and it can be useful in healthcare, finance, transportation, everyday endeavours, and largely educational activities (Apelehin et al., 2025).

Peras et al. (2023) In their study about AI and academic performance disclosed that, there is strong and significant correlation between AI use and academic performance or success of students (particularly at the university level). Thus stressing the use of AI tools to improve teaching and learning and academic performance. Slimi (2023) divulged that, AI revolutionized education by personalizing teaching methods, and AI exert positive impacts on learning and knowledge acquisition. Trisoni et al.(2023) in their study of effects of AI on students achievement in high schools from Indonesia, found that, AI improve academic achievement, by helping teachers and teaching interactions. Edionwa (2024) stressed the fact that, AI does not make a significant influence on the students in business studies. However, Basha (2024) stress that relying on AI only during learning include drawbacks such as failure to improve critical thinking skills, and causing inactivity in academic performance. Therefore, it is important to verify the effect or impact of AI use in some higher institution students in Bauchi, Nigeria.

Artificial Intelligence (AI) is rapidly contributing significantly in our everyday life. AI in education is an important aspect that has been into development of nowadays. AI is aimed at revolutionizing academic activities worldwide, offering unprecedented contributions and opportunities that are advantageous in personalized learning efficiency, improving educational achievement and outcomes (Madhu et al., 2024; Mike et al., 2024; Calvo, 2025). Educators and learners can vividly utilize AI to make strategies to improve learning interactions, make decisions, break barriers to education, improve equality, equity, and accessibility, among others. AI help to enhance personalized learning, allow the use of automated administrative tasks, help in engaging more learners, improved accessibility, improve classroom efficiency, and AI help in conducting better assessment, among others. Parable, AI provides adaptive learning that involves provision of assessment to learners and consequently assisting them with content that meet needs (Ayeni et al., 2024; Dumbuya, 2024). The contents adapt to the learners responses. AI provides "assisted technology" that recognize speech and thereby helping disabled learners. Data analytics has the advantageous nature of assisting to analyze data obtained in online classes and consequently grading the learners. AI help in classroom management by providing customized learning experiences that are in adaptable or in tandem with the unique nature of each learners (Basha, 2024; Katiyar et al., 2024). Smart content opportunities in AI aid the teachers to prepare digital lessons or study materials. AI tools are useful in language learning by assisting with personalized language experiences. AI incorporate games into learning making it an enjoyable affair. Other advantages of AI include, simulation, multidisciplinary

learning, awareness creation, virtual tutors, guest speaking, professional development, etc (OECD, 2020; Edionwa, 2024; Vorobyewa et al., 2025). The objective of this work is to assess the impact of use of artificial intelligence (AI) on academic performance in students of higher institution.

Materials and Methods

The study was an interventional cross-sectional design performed at a private higher institution in Bauchi, Nigeria. The study recruited two groups of test (33 individuals, out of which 3 quit along the way, and leaving 30 participants), and 25 (control, whereby 3 quit before completion voluntarily). The test group were taught using a prepared lesson plan and note made by using AI on benefits and uses of AI by students in learning for a period 3 lecture contacts (2 hrs per contact). At the end an overall assessment was done (each person should answer an objective question and can score 100 marks). Therewith, control group were taught about personal hygiene using manual lesson plan and note for three consecutive lectures and assessment was done at the halt. The results were subjected to descriptive statistics, and chi square test was made at (p<0.05) level of significance.

Results and Discussion

The results for this study are in the Tables 1 and 2.

Table 1: Characteristics of the participants among the students

Characteristics	Frequency	Percentage
Sex		
Male	32	61.5
Female	20	38.5
Age		
18-20 years	10	19.2
21-22 years	10	19.2
23 and above years	32	61.5
Religion		
Islam	52	100.0
Level		
100	14	26.9
200	13	25.0
300	25	48.1

Based on the results indicated in Table 1, the 61.5% of the participants are male, and 38.5% are females. In terms of age, 19.2% are 18-20yrs old, 19.2% are 21-22years old, and 61.5% are 23years old and above. 26.9% of them are in 100 level, 25.0% are in 200 level, and 48.1% are in 300 level.

Table 2: Impact of use of AI in teaching higher institution students

	Number of students (N)	Total mean marks	Standard deviation	X ²	Remarks

Students under intervention (Test group)	30	1506	8.000	111.21	Significant
Control group	22	796.5	15.000	7654.2	Significant

According to the results in Table 2, the students that received an intervention on use of AI in learning and teaching interactions scored a total mean marks of 1506+8.0, while the control group had a total mean marks of 796.5+15.0; therewith, the result was significant ($P<0.05$) after performing chi-square test. Thus, the students that received an AI intervention have more impacts on their academic performance. The improvement in academic performance is linked to the opportunities provided by AI to both learners (students) and teachers, such as personalized learning, simulation, equity, and accessibility among others. However, the results found in this study is relevant to other past studies. Parable, Muresan (2023) in a study of impact of AI on education advocate that AI will play major role in encouraging personalized learning, enabling content, teaching styles, development of unique skills (such as communication, and collaborations among students and teachers). Eltahir & Babiker (2024) in their study, underscore the ability of AI to elicit transformative potentials in education, by encouraging intelligent tutoring, personalized learning and automated grading. Additionally, AI help institutions to have efficiency and inclusive learning. In Mike et al. (2024) the findings revealed that, chatGPT help in eliciting business informatics students to finish tests speedily (a portend of efficiency). Thus, the significant need to integrate AI in our educational systems is becoming clear to may over the years. AI in education will help invariably in revitalizing performance of workers (staff) and students, given better ways of monitoring students learning and managing instructions (Rajeena & Quraishi, 2024). One major issue that affect the use of technological advancements is lack of awareness. Thus, it is important that the educational managers (especially the government) make significant move to bring AI tools into limelight in the various tiers of educational systems in the country. The more students and teachers are aware about AI, the more it's uses, and advantages are noticed.

Conclusion

The objective of this work is to assess the impact of use of artificial intelligence (AI) on academic performance in students of higher institution. Thus, this study shows the impact of Artificial Intelligence (AI) on academic performance, indicating where students who received AI intervention scored significantly higher than the control group. The findings suggest AI can improve learning outcomes through personalized learning, simulation, and accessibility

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