# EFFECT OF AI-CHATGPT ON STUDENTS' ACADEMIC PERFORMANCE IN PHYSICAL AND HEALTH EDUCATION IN UNIVERSITIES IN AKWA IBOM STATE, NIGERIA

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**Abstract**
The study examined the effect of AI-ChaGPT on students' academic performance in Physical and Health education in Universities in Akwa Ibom state, Nigeria. Two objectives, research questions and hypotheses guided the study. Quasi-experimental research design was adopted. The population of the study comprised 188-year two Integrated Science Pre-service students. Multistage sampling technique was used to draw 108 students from the population. The instrument "Environmental and Health Education Test" containing twenty multiple choice test items was used for data collection. Two assessors validated the instrument, and a reliability index of 0.80 was obtained using Kuder-Richardson's formula 20. Independent t-test was used to test the hypotheses at 0.05 level of significance. Findings showed that there is significant difference in the mean academic performance scores of students taught using AI-ChatGPT and lecture method in favour of ChatGPT; and there is no significant difference in the mean performance scores of males and female students taught using ChatGPT and lecture method. It was concluded that ChatCPT was more effective in students' academic performance more than the lecture method. It was recommended among others that innovative teaching strategies that will inculcate interest, creativity and engagement irrespective of gender in the students should be encouraged for teaching.
**Keywords:** AI-ChatGPT, Academic Performance, Physical and Health Education

## Introduction

Increasing emerging digital trends and global competitiveness have spurred today's learners' curiosities towards being independent. With the global shifts to digital media and information, digital technology has become an inseparable element of the educational system and has played a key role in assisting students in achieving their goals. Akpan (2024) observed that digital technology provides the means for students' deeper search for information, knowledge and equips them for stimulated learning. Etiubon, et al., (2021) and Umoetuk and Akpan (2023) noted that the education sector is witnessing a paradigm shift by using digital resources in instructional practices to strengthen students' learning experiences. The benefits of digital technology in education include the accessibility to learning it provides, changing learning from talk-chalk to being interactive and engaging (Akpan, et al., 2025). The

application of digital technology covers vast areas of human endeavours, as more advanced technologies and computer programmes emerge into sophisticated systems, encompassing robotics, coding, artificial intelligence, biotechnology, digital surveillance and many more (Nathan, et. al; 2025). For educational purposes, there is a present transition towards a more intricate digitalization referred to as artificial intelligence (AI). This AI in education has contributed to the transformation of teaching and learning.

AI innovation is one of the prominent advances in the development of technologies. It is human intelligence or behaviour demonstrated by machines (Akpan, et al; 2024). An innovation that that encompasses the creation of computer systems with the ability to execute activities that usually need human intellect. For AI tools to carry out these tasks, they are built on the three fundamental cognitive skills of learning, reasoning and self-correction, which governs the daily lives of humans. AI tools can process vast information, identity patterns, make predictions and improve on their performance with time, much like humans (Amuseghan & Emmanuel, 2025). One AI tool that has proliferation in the academic communities worldwide is the chatGPT.

Generative pre-trained transformer (ChatGPT) is a virtual assistant made by Open AI in November 2022 that uses a natural language processing system designed to generate structured, cohesive, and informative responses akin to those crafted by humans, tailored to user prompts (Ezeah & Ozioko, 2024). It is tool that can quickly produce detailed replies to prompts and follow-up questions. According to Akpan, et al (2025) and Pawar (2023), chatGPT is an AI powered assistant that helps students with homework, writing, coding. It enables interactive conversations with users by leveraging extensive text training data to generate meaningful and contextually appropriate replies. ChatGPT can enhance individualized learning, by addressing students' inquiries and delivering educational materials, while also being harnessed in content generation tasks, assisting users in generating written content like articles, narratives, and code segments (Zhai et al., 2024). It has the capacity to generate human-like responses when prompted Zishan-Ahmed, et al., 2025). It can hold conversations with humans, respond to queries in real time, break down complex ideas and engage learners in interactive dialogue (Njoku & Emeka, 2024)

Beyond its ability to generate human-like text responses, ChatGPT holds great potential for teachers and students. According to Njoku and Njoku (2025), teachers could use ChatGPT in generating lesson plans, conduct assessments and grade students. In the same vein, educational institutions could leverage the tools to improve their curriculum so that learners could acquire the latest skills that make them relevant in contemporary society. ChatGPT enhance individualized learning encountered by addressing students enquires and delivering educational materials (Tunde- Awe, 2024).

Curriculum changes with the needs, challenges and aspirations of the society, that is why issues like environmental/health education and management are introduced into Physical and Health Education in the Basic Science and Technology curriculum to infuse emergent global issues of concern which impact the environment, and have negative health implications (Akpan, 2016; Akpan & Udoh, 2016). The Basic Science and Technology curriculum used in

our primary and secondary schools contain four themes: basic science, basic technology, physical and health education and information communication. The objectives of Physical and Health Education are to promote physical fitness, develop motor skills, promote healthy lifestyles regarding hygiene and mental alertness, as well as enable students arrive at suitable conclusions based on scientific knowledge and take action as individuals, family and community for protecting, maintaining and promoting individual and community health. Therefore, the subject should be taught in ways that will enhance learners' awareness and understanding of their environments and health implications; acquisition of skills and enrichment of students learning experiences (Federal Republic of Nigeria, 2012).

In spite of the emphasis on the approaches of teaching Physical and Health Education, there still exist complaints on students' poor academic performance and lack of awareness on environmental and health issues plaguing our society. These may arise due to the poor methods of teaching used by the teachers, which are not encouraging students' participation (Akpan & Akpan, 2017). Globally, the pattern of teaching and learning is changing, thereby creating a paradigm shift in teaching, thus making the classroom more engaging, compelling and interesting (Akpan, et al., 2023). Akpan and Akpan (2017) opined that there is a need for teachers to identify approaches that are innovative and activity based such as the integration of AI-ChatGPT into teaching, thereby making learning personalized, engaging and effective for students (Akpan, et al., 2025, Nathan et al., 2025). When instructional approaches are inclusive, gender disparity is not often an issue. Gender is an issue that has been long debated in science teaching and learning. It is a socially constructed role, behaviour or expectations associated with being male or female. It is one of the variables that influences students' academic performance in school, thus highlighting the need for review from time to time (Umoetuk & Akpan, 2023).

Empirically, studies have investigated the effects of ChatGPT on students' academic achievement.

Asare, et al., (2024) exploring the impact of ChatGPT assisted learning on students' performance in Mathematics, observed that students taught using ChatGPT demonstrated improved and higher academic achievement in algebra and geometry. Abbas et al., (2024), observed that ChatGPT gives students personalized learning support that encourages students to learn by texts and conversations. Akpan, et al., (2025) showed that chatGPT is widely accepted as an effective tool in completing academic assignments and increase learning efficiency. Njoku and Njoku (2025) findings on the use of ChatGPT in solving geometry problems showed a significant improvement in students test scores especially among low performing students who benefitted from the step-by-step working provided by ChatGPT. Similarly, Egara and Mosimege (2024) study on the effect of ChatGPT on mathematics perception and performance reported that students' interests increased significantly when taught with ChatGPT. Akpan, et. al., (2025); Adebayo and Balogun (2019) study on the effect of digital learning tools (online learning platforms) including AI-powered applications recorded significantly higher levels of interest and engagement in lessons compared to those in the traditional classrooms. On the contrary, Gidado & Zubair (2025), found that there was no

significant difference in the achievement scores of 200L students taught with AI-chatGP. Likewise, Zishan-Ahmad, et al., (2025) study on ChatGPT impact on students' creativity and academic performance confirmed no significant differences in ChatGPT usage.

On gender, disparities in students' academic achievement remain a persistent issue, therefore Umeh and Okoro (2024), examined gender influence on the use of AI-ChatGPT learning tools and found that male and female students academically showed increased interest in learning. Akpan (2024) reported that the male students often outperform females in digital tasks. Akpan, et. al., (2025) study showed that there was a higher mean score by female students taught using interactive virtual resources over the male students. Gidado and Zubair (2025) observed a significant difference between male and female students' performance when taught with AI-ChatGPT, with the male having higher mean scores. In contrast, Zishan-Ahmad, et al (2025), reported no significant difference in ChatGpt usage based on gender. Also, Chika and Bello (2023), reported no significant gender difference in achievement when instructional methods were inclusive and technology driven.

**Statement of the Problem**

More often, teachers adopt wrong instructional approaches and resources in teaching some concepts in schools, the adoption of inappropriate methods by teachers has greatly affected students' engagement, interest and achievement in the classroom. Teaching and learning in these modern times demand innovation, creativity, competence and efficiency on the parts of the teacher. It has been observed that many societies are embracing the use of technology in virtually all their daily lives, including creating awareness, monitoring the environmental and health status of the community, as well as apply in teaching and learning. This study is significant as there is scarcity of resource on students' academic performance, especially with limited empirical evidence on the use of AI – ChatGPT in Akwa Ibom State. The question is, will the use of ChatGPT enhance academic performance of students? This study therefore sought to investigate the effect of AI-ChatGPT on students' academic performance in Physical and Health Education in universities in Akwa Ibom State, Nigeria.

**Objectives of the Study**

The study was carried out to examined effect of AI-ChaGPT on students' academic performance in Physical and Health education in universities in Akwa Ibom state, Nigeria. Specifically, the study sought to:

1. Determine the mean performance scores of students in Physical and Health Education when taught using ChatGPT and traditional lecture method.
2. Ascertain the difference in the mean performance scores of male and female students in Physical and Health education when taught using AI-ChatGPT and traditional lecture method.

**Hypotheses**

The following null hypotheses were formulated to guide the study.

1. $Ho_1$: There is no significant difference in the mean academic performance scores of students when taught Physical and Health Education using AI-ChatGPT and those taught using lecture method.

2. $Ho_2$: There is no significant difference in the mean academic performance scores of male and female students when taught Physical and health education using AI-ChatGPT and those taught using lecture method.

**Methodology**

The research design adopted in this study was quasi-experimental design. The design was specific with only posttest and two experimental groups. The study was undertaken among Integrated Science Pre-Service teachers in the public universities in Akwa Ibom state taking the courses Nigeria Integrated Science curriculum and Secondary School Basic Science and Technology Contents, where Physical and Health Education themes are contained. University of Uyo, Akwa Ibom State University and Akwa Ibom State University of Education met the condition. The population of the study was one hundred and eighty-eight students (188) year two students. Multistage sampling technique was used to draw samples for the study. Simple random sample technique was used to draw 111 students in their intact classes from two universities. The students were then randomly assigned into two groups. Group one had 61 students (23 males and 38 females) taught using AI-ChatGPT, while group two, had 50 students (17 males and 33 females) taught using traditional lecture method (TLM).

The instrument for data collection was the Environmental and Health Education Test (EHET) on Wastes Management in Physical and Health Education theme. The test had two sections A and B, Section A contained demographic information on name of university and gender, while section B contained twenty (20) multiple choice test items. Each question had four options lettered A-D, with one correct option among three distractors. The instrument was validated by two assessors, an expert in Measurement and Evaluation and another in Health Education, in order to check for appropriateness, clarity and adequacy in addressing the objectives of the study. The reliability index of the instrument was determined by administering the test to 20 students within the population that were not used for the main study, using Kuder-Richardson's formula 20, and a reliability coefficient of 0.80 was obtained. After two weeks of lesson delivery, the test was administered to the two groups. Out of the sample size of 111 students, 108 wrote the test. Data collected were analyzed using mean, standard deviation and independent t-test.

**Results**

**Hypothesis One:** There is no significant difference in the mean academic performance scores of students when taught physical and health education using AI-ChatGPT and those taught using lecture method.

**Table 1:** Independent t-test analysis of the difference in the mean academic performance scores of students in hypothesis one. (n = 108)

| Instructional Approach | N | Mean | SD | df | t-cal | t-cit | P.cal | Remarks |
|---|---|---|---|---|---|---|---|---|
| AI-ChatGpt | 60 | 19.04 | 1.65 | 106 | 6.34 | 1.98 | .000* | Significant |

| | | | |
|---|---|---|---|
| TLM | 48 | 15.88 | 3.10 |

The result in the table 1, above shows that students taught using AI-ChatGPT had a higher mean score of (19.04) than those taught using TLM (15.88). It also revealed that the (calculated t-value of 6.34; df =1.98) with a corresponding P-cal value of .000 is less than the probability value of 0.05 level of significance. With this result, the null hypothesis was rejected. This implies there is significant difference in the mean performance scores of Pre-Service Science teachers in PHE taught using AI-ChatGPT and tradition lecture method.

**Hypothesis Two:** There is no significant difference in the mean academic performance scores of male and female students when taught Physical and health education using AI-ChatGPT and those taught using lecture method.

**Table 2:** Independent t-test analysis of the difference in the mean performance scores of male and female students taught using AI-ChatGPT and traditional lecture method. (n = 108)

| **Instructional resources** | **Gender** | **N** | **Mean** | **SD** | **df** | **t-cal** | **t-crit** | **p.cal** | **Remarks** |
|---|---|---|---|---|---|---|---|---|---|
| AI-ChatGPT | Male | 22 | 19.29 | 1.63 | 58 | 1.04 | 1.99 | . .306 * | Not significant |
| | Female | 38 | 18.81 | 1.67 | | | | | |
| | Male | 16 | 16.09 | 3.49 | 46 | 0.45 | 2.01 | . .654 * | |
| TLM | Female | 32 | 15.68 | 2.75 | | | | | Not significant |

The result in Table 2 revealed that the calculated t-value (1.04; df = 58 for AI-ChatGPT and 0.45; df = 46 for TLM) with corresponding p-cal value of .306 and .654 respectively, are greater than the declared probability value of 0.05 level of significance, therefore hypothesis 2 is retained. This implies that there is no significant difference in the mean performance scores of male and female students taught physical and health education using AI-ChatGPT and lecture method.

**Discussion of Findings**

The result of analysis of the difference in the mean performance scores of students taught using ChatGPT and traditional lecture method, revealed that there is significant difference in the mean performance scores of students in favour of those taught with ChatGPT. Though both are tasks structured, this result could be attributed to the fact that with ChatGPT, learners get excited, because they get instant response to their prompting, can visualize abstract concepts and link them to prior knowledge. ChatGPT encourages personalize learning, which facilitate their understanding of the subject matter taught, thereby fostering conceptual learning leading to good academic performance. The finding is in line with that of Akpan et al (2025) findings, that ChatGPT is an effective tool in teaching and learning and increases learning efficiency through better comprehension by providing useful suggestions, boosting effort and improving task engagement. It was also in agreement with Abbas et al., (2024), Njoku and

Njoku (2025), Egara and Mosimege (2024) and Adebayo and Balogun, (2019) that students taught with AI-ChatGPT performed better than those taught with the TLM. It was at variance with Ahmad, et al., (2025), Gidado and Zubair (2025), who reported no significant difference in ChatGPT usage.

The result of analysis of the difference in the mean performance scores of male and female students in PHE taught using ChatGPT revealed that there is no significant difference in the mean performance scores of male and female teachers taught using AI-ChatGPT. The finding is in line with that of Umeh and Okoro, (2024); Zishan-Ahmad, et al (2025), Chika and Bello (2023) who found that there was no significant difference in the mean scores of male and female students exposed to ChatGPT during teaching and learning. The finding could be attributed to the fact that when both male and female students are exposed to the same instructional procedure, they are likely to perform at the same level. On the result of analysis of the difference in the mean performance scores of male and female science teachers in PHE taught the using traditional lecture method revealed that there is no significant difference in the mean performance scores of male and female students. The finding was at variance with Akpan et al, (2025), Akpan (2024), and Gidado and Zubair (2025) significance variation in gender difference in academic performance of students taught traditional lecture method. It was found that gender did not influence students 'academic performance and that instructional approaches when properly used, engender interest and creativity in the students and hence their performance.

**Conclusion**

Based on the findings of the study, it was concluded that using AI-ChatGPT got the students actively involved during the teaching learning process, as it personalized learning, caused engagement, excitement and facilitated students' understanding of the Physical and Health Education concepts taught better than traditional teaching, and that gender had no statistically significant influence on the students' performance, this is because if female students are exposed to the same instructional approaches, will perform excellently well as their male counterparts.

**Recommendations**

Based on the findings and conclusion drawn, the following recommendations were made:

1. Teachers should adopt AI resources for teaching at all levels of education, instead of depending solely on the use of lecture methods.
2. All students should be encouraged to the sciences and use of digital technologies irrespective of their gender.

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