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Effect of Artificial Intelligence-Assisted Instruction on Students' Achievement and Interest in Basic Science and Technology in Secondary Schools in Imo State

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Abstract: This study investigated the effect of Artificial Intelligence (AI)-assisted instruction on students' achievement and interest in Basic Science and Technology in secondary schools in Imo State, Nigeria. It also examined gender differences in achievement and interest among students exposed to AI- assisted instruction. The study adopted a quasi- experimental, non- randomized pretest- posttest control group design. The study involved 120 Junior Secondary School Two (JSS II) students drawn from four public secondary schools, with 60 students in the AI- assisted instruction group and 60 in the conventional teaching group. Data were collected using the Basic Science and Technology Achievement Test (BSTAT) and the Basic Science and Technology Interest Scale (BSTIS). The study answered the research questions using means and standard deviations and tested the hypotheses at the 0. 05 level of significance using Analysis of Covariance (ANCOVA). The findings showed that students taught using AI- assisted instruction recorded a slightly higher posttest achievement mean of 12. 12.87 than those taught using the conventional method, who obtained 12. 12.78. The difference in achievement was statistically significant, F(1, 115) = 3. 476, p =. .005. Students in the AI- assisted group also recorded a higher posttest interest mean of 3. 18, compared with 1. 84 for the conventional group, with a statistically significant instructional-method effect, F(1, 115) = 969. 969.841, p <. .001. Gender- based descriptive results showed that male students recorded a higher posttest achievement mean of 14. 14.25 than female students, who obtained 12. 12.18. However, female students recorded a higher posttest interest mean of 3. 28 compared with 2. 97 for male students. The study concludes that AI-assisted instruction can improve students' interest in Basic Science and Technology and may also support achievement. It recommends that Basic Science and Technology teachers integrate appropriate AI tools into classroom teaching while providing equitable learning opportunities for male and female students.

Keywords: *Artificial Intelligence-Assisted Instruction, Academic Achievement, Students' Interest, Gender, Basic Science and Technology.*

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I. INTRODUCTION

➢ *Background to the Study*

Education is widely recognised as a key driver of scientific advancement, technological innovation, and socio-economic development. The quality of education provided in schools largely determines a nation's ability to develop skilled human resources capable of addressing contemporary challenges. In recent years, rapid advances in digital technologies, particularly Artificial Intelligence (AI), have begun to reshape many sectors, including healthcare, finance, agriculture, manufacturing, and education. Artificial Intelligence (AI) refers to computer systems capable of performing tasks that typically require human intelligence, including learning, reasoning, decision-making, and problem-solving (Russell & Norvig, 2021).

Within the educational sector, AI-assisted instruction involves the use of intelligent technologies such as adaptive learning platforms, intelligent tutoring systems, educational

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chatbots, virtual laboratories, automated assessment tools, and personalised learning applications to enhance teaching and learning. These technologies enable learners to receive individualised instruction, timely feedback, and learning experiences tailored to their abilities and learning needs. The growing adoption of Artificial Intelligence in education reflects global efforts to promote learner-centred teaching and improve learning outcomes. Unlike conventional teacher-centred approaches, AI-assisted instruction enables students to learn at their own pace, receive immediate feedback, identify areas requiring improvement, and participate more actively in the learning process. These technologies encourage critical thinking, creativity, collaboration, and problem-solving while helping teachers automate routine instructional tasks, monitor students' progress, and make informed instructional decisions based on learning analytics (Okunade, 2024).

While AI has gained attention across many educational contexts, its application is particularly relevant to Basic Science and Technology because the subject emphasises inquiry, experimentation, problem-solving, and technological innovation. The subject integrates concepts from Basic Science, Basic Technology, Information Technology, Physical and Health Education, and related disciplines. According to the Nigerian Educational Research and Development Council (NERDC, 2013), its primary objectives are to promote scientific literacy, technological competence, creativity, innovation, and problem-solving skills. These competencies prepare students for advanced studies in science, engineering, medicine, agriculture, and other technology-related fields. Despite these objectives, many secondary school students continue to record poor achievement and demonstrate limited interest in the subject.

Academic achievement represents the extent to which educational objectives have been attained after instruction. It is commonly measured using achievement tests, examinations, or continuous assessment scores. Students' interest, on the other hand, refers to their positive feelings, curiosity, enthusiasm, motivation, and willingness to participate in learning activities. Educational psychologists have consistently maintained that students who possess high interest in a subject tend to demonstrate greater persistence, active participation, improved understanding, and higher academic achievement. Consequently, both achievement and interest are considered important indicators of instructional effectiveness.

Several factors have been identified as contributing to poor achievement and declining interest in Basic Science and Technology among secondary school students in Imo State. These factors include but are not limited to inadequate instructional materials, overcrowded classrooms, insufficient laboratory facilities, teacher-centred teaching approaches, poor integration of educational technologies, inadequate teacher competence in digital pedagogy, and limited opportunities for individualised learning. Traditional lecture methods often encourage passive learning, where students merely receive information without meaningful engagement or immediate feedback. Such instructional practices may fail to accommodate learners with different abilities, learning styles, and instructional needs, thereby reducing students' motivation and academic performance.

AI-assisted instruction offers practical solutions to many of the instructional challenges facing science classrooms. AI-powered instructional systems provide adaptive learning experiences that respond to individual learners' strengths and weaknesses. Intelligent tutoring systems can diagnose students' misconceptions, recommend appropriate learning resources, generate practice exercises, and provide immediate corrective feedback. Educational chatbots can support students outside classroom hours by answering questions and reinforcing classroom instruction. Similarly, AI-powered simulations and virtual laboratories allow learners to explore scientific concepts that may otherwise be difficult to demonstrate because of inadequate laboratory facilities. These capabilities promote active learning, enhance students' confidence, and increase their interest in science-related subjects.

The study is anchored on Self-Determination Theory and Cognitive Load Theory. Self-Determination Theory provides an explanation of how students' motivation and interest in learning are influenced by the extent to which their psychological needs for autonomy, competence and relatedness are satisfied. In the context of artificial intelligence-assisted instruction, students can engage with scientific concepts at their own pace, receive individualised feedback and access additional explanations to support their understanding. Such opportunities may strengthen students' confidence, active participation and interest in Basic Science and Technology (Ryan & Deci, 2020; Wang et al., 2024).

Cognitive Load Theory complements this position by explaining how the organisation and presentation of instructional information influence students' understanding and academic performance. AI-assisted instructional resources can provide structured explanations, visual representations, immediate feedback, and opportunities for repeated practice. When appropriately designed and guided by teachers, these features may reduce unnecessary cognitive demands and support meaningful processing of scientific information (Alam, Islam, Babiker, Siddiqui, Amin, & Oláh, 2026). Together, the two theories provide a basis for explaining how AI-assisted instruction may influence students' achievement and interest in Basic Science and Technology.

Empirical studies have increasingly demonstrated the positive influence of technology-assisted instruction on students' learning outcomes. Udoh and Anaekwe (2024) reported that computer-aided instruction significantly improved students' achievement and interest in Integrated Science compared with conventional teaching methods. Similarly, Ngwu (2025) found that computer-assisted instruction enhanced students' academic performance and retention in Biology. Meta-analytic evidence further indicates that AI-supported instructional approaches produce moderate to high improvements in students' academic performance, particularly in STEM-related subjects, through

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personalized learning and continuous feedback mechanisms. In another study, Umoru and Zainaba (2026) examined ChatGPT-assisted instruction and academic performance in Genetics among Senior Secondary II Biology students in Jalingo, Taraba State. The quasi-experimental study involved 125 students, with 60 in the experimental group and 65 in the control group. The researchers used a Genetics Academic Performance Test and analysed the results using the mean, standard deviation, and ANCOVA.

The findings indicated that students taught using ChatGPT performed significantly better than those taught through conventional instruction. The researchers also found no statistically significant difference between male and female students exposed to ChatGPT-assisted instruction. The results suggest that AI-assisted learning can support achievement without necessarily producing a gender advantage.

In another study, Njoku, Inah, and Emeka (2026) investigated the effect of an AI-integrated teaching method on students' interest and academic achievement in Mathematics in Aba Education Zone, Abia State. The study involved 200 Senior Secondary II students from six schools during the 2024/2025 academic year. The researchers adopted an explanatory sequential mixed-method design and used a Mathematics Achievement Test, a Mathematics Interest Scale, and focus group discussions to collect data. The study reported significant improvements in both academic achievement and interest among students taught through the AI-integrated method. This is useful evidence because it examines interest as a measurable learning outcome rather than focusing solely on test performance. However, the abstract available does not establish whether male or female students recorded higher interest scores or whether the intervention affected the two groups differently.

Although studies on computer-assisted instruction and educational technology are relatively common, empirical evidence specifically examining Artificial Intelligence-assisted instruction in Basic Science and Technology within Nigerian secondary schools remains limited. Most existing Nigerian studies have focused on computer-assisted instruction, audiovisual materials, or general educational technology rather than AI-enabled instructional systems. Furthermore, few studies have investigated the simultaneous influence of AI-assisted instruction on both students' achievement and interest in Basic Science and Technology, particularly within Imo State secondary schools. This creates an important gap in knowledge that requires empirical investigation.

Imo State, like many other states in Nigeria, has continued to implement policies aimed at improving science education through the integration of Information and Communication Technology (ICT). However, many secondary schools still experience challenges associated with inadequate utilization of emerging technologies, including Artificial Intelligence, for instructional delivery. As educational systems worldwide continue to embrace AI-powered teaching and learning, there is a growing need to determine whether AI-assisted instruction can significantly improve students' academic achievement and stimulate greater interest in Basic Science and Technology among secondary school students in Imo State.

It is against this background that this study seeks to investigate the effect of Artificial Intelligence-assisted instruction on students' achievement and interest in Basic Science and Technology in secondary schools in Imo State. Findings from the study are expected to provide empirical evidence that will guide teachers, curriculum planners, educational administrators, policymakers, and other stakeholders in making informed decisions regarding the integration of AI technologies into science education for improved learning outcomes.

- *Statement of the Problem*

Basic Science and Technology is a fundamental subject in the Nigerian secondary school curriculum because it provides students with the scientific knowledge, technological skills, and problem-solving abilities needed for further education and national development. Despite its importance, many secondary school students continue to record poor academic achievement and demonstrate low interest in the subject. This situation is a major concern because poor performance in Basic Science and Technology can weaken students' foundation for science-related disciplines and reduce their readiness for careers in science, technology, engineering, and innovation.

Evidence from classroom assessments, teachers' reports, and public examinations indicates that the achievement of students in Basic Science and Technology has remained below expectations, while many students exhibit declining interest in science-related learning. Researchers and education stakeholders have linked this persistent problem to factors such as teacher-centred instructional practices, inadequate use of innovative teaching strategies, insufficient instructional resources, limited opportunities for individualized learning, and low levels of learner engagement (Federal Republic of Nigeria, 2014). These classroom challenges often result in passive learning, reduced motivation, and poor understanding of scientific concepts.

Over the years, efforts have been made to improve students' learning outcomes through the use of computer-assisted instruction, audiovisual materials, and other educational technologies. Although these instructional innovations have produced some positive results, they have not adequately addressed the diverse learning needs of students or provided the level of personalization, continuous feedback, and adaptive support required to sustain students' interest and improve achievement in Basic Science and Technology. Consequently, the problem of poor academic performance and low interest in the subject persists in many secondary schools, particularly in Imo State.

The emergence of Artificial Intelligence (AI) presents a promising opportunity to improve instructional delivery and enhance students' learning experiences. AI-assisted

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instruction supports personalized learning by adapting instructional content to individual learners' needs, providing immediate feedback, identifying learning difficulties, and promoting active participation through intelligent tutoring systems, educational chatbots, virtual laboratories, and adaptive learning platforms. These features have the potential to improve students' understanding of scientific concepts, increase their motivation and interest, and ultimately enhance their academic achievement (Russell & Norvig, 2021).

Despite the growing global adoption of AI in education, empirical evidence on its application in the teaching of Basic Science and Technology in Nigerian secondary schools remains limited. Most existing studies have focused on computer-assisted instruction, multimedia learning, or general educational technology, with relatively few investigations examining the specific effect of AI-assisted instruction. Furthermore, there is limited empirical evidence on the combined influence of AI-assisted instruction on students' achievement and interest in Basic Science and Technology, particularly among secondary school students in Imo State. This gap in the literature makes it difficult to determine whether AI-assisted instruction offers a more effective alternative to conventional teaching methods in the local educational context.

It is against this background that the present study seeks to investigate the effect of AI-assisted instruction on students' achievement and interest in Basic Science and Technology in secondary schools in Imo State. The findings of the study are expected to provide empirical evidence that will assist teachers, curriculum developers, educational administrators, and policymakers in making informed decisions regarding the effective integration of Artificial Intelligence into science education to improve students' learning outcomes.

➢ *Purposes of the Study*

The purpose of this study is to examine the effect of AI-assisted instruction on students' achievement and interest in Basic Science and Technology among Junior Secondary School students in Imo State. Specifically, the study seeks to:

- Determine the effect of AI-assisted instruction on students' achievement in Basic Science and Technology;
- Determine the effect of AI-assisted instruction on students' interest in Basic Science and Technology;
- Examine the influence of gender on students' achievement when taught using AI-assisted instruction; and
- Examine the influence of gender on students' interest when taught using AI-assisted instruction.

➢ *Research Questions*

The following research questions will guide the study:

- What is the effect of Artificial Intelligence-assisted instruction on students' achievement in Basic Science and Technology in secondary schools in Imo State?
- What is the effect of Artificial Intelligence-assisted instruction on students' interest in Basic Science and Technology in secondary schools in Imo State?
- What is the influence of gender on students' achievement in Basic Science and Technology when taught using Artificial Intelligence-assisted instruction?
- What is the influence of gender on students' interest in Basic Science and Technology when taught using Artificial Intelligence-assisted instruction?

➢ *Research Hypotheses*

The following null hypotheses will be tested at the 0.05 level of significance:

- H_{01}: There is no significant difference in the mean achievement scores of students taught Basic Science and Technology using Artificial Intelligence-assisted instruction and those taught using the conventional teaching method.
- H_{02}: There is no significant difference in the mean interest ratings of students taught Basic Science and Technology using Artificial Intelligence-assisted instruction and those taught using the conventional teaching method.

II. RESEARCH METHOD

The study will adopt a quasi-experimental research design, specifically the non-randomised pretest-posttest control group design. This design is considered appropriate because intact classes rather than individual students will be used for the experiment, making random assignment of participants impracticable. The study will be carried out in Imo State, Nigeria. Imo State is one of the five states in the South-East geopolitical zone of Nigeria. The state comprises three education zones, namely Owerri, Okigwe, and Orlu Education Zones. The population of the study will comprise all Junior Secondary School Two (JSS II) students offering Basic Science and Technology in public secondary schools in Imo State during the 2026/2027 academic session. The sample for the study will consist of approximately 120 JSS II students drawn from four public secondary schools in Imo State.

Two researcher-developed instruments will be used for data collection: the Basic Science and Technology Achievement Test (BSTAT) and the Basic Science and Technology Interest Scale (BSTIS). The BSTAT will consist of multiple-choice achievement items, while the BSTIS will contain 20 items rated on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). The instrument will assess students' interest in learning Basic Science and Technology. The instruments will be subjected to face and content validation by three experts: one expert in Science Education (Basic Science), one expert in Educational Technology, and one expert in Measurement and Evaluation. Their observations and suggestions will be

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incorporated before the final administration of the instruments.

The Basic Science and Technology Achievement Test (BSTAT) will be trial-tested using students outside the study area. The reliability coefficient will be determined using the Kuder-Richardson Formula 20 (KR-20) because the test items are scored dichotomously. The Basic Science and Technology Interest Scale (BSTIS) will also be trial-tested, and its internal consistency will be determined using Cronbach's Alpha. A reliability coefficient of 0.70 or above is considered acceptable. The researcher, assisted by four trained research assistants who are Basic Science and Technology teachers, will administer the instruments. The pretest will be conducted before the commencement of the treatment, while the posttest will be administered immediately after the treatment period. Research questions will be answered using mean and standard deviation. The null hypotheses will be tested at the 0.05 level of significance using Analysis of Covariance (ANCOVA), which will be used to test the null hypotheses because it controls for pretest differences between the experimental and control groups, thereby providing a more accurate estimate of the treatment effect.

III. RESULTS

➢ *Research Question One:*

What is the effect of Artificial Intelligence-assisted instruction on students' achievement in Basic Science and Technology in secondary schools in Imo State?

Table 1 Summary of Mean and Standard Deviation of Students' Mean Achievement in Basic Science and Technology in Secondary Schools in Imo State.

PreACH PostACH PreINT PostINT * Method					
Method		**PreACH**	**PostACH**	**PreINT**	**PostINT**
AI-Asst	Mean	8.28	12.87	2.88	3.18
	N	60	60	60	60
	Std. Deviation	1.896	3.017	.242	.295
Control	Mean	8.33	12.78	2.67	1.84
	N	60	60	60	60
	Std. Deviation	1.481	2.498	.197	.141
Total	Mean	8.31	12.82	2.78	2.51
	N	120	120	120	120
	Std. Deviation	1.694	2.758	.243	.712

The results of the descriptive statistics show that students taught Basic Science and Technology using Artificial Intelligence-assisted instruction (AI-assisted group) had a pre-test mean achievement score of 8.28 and a post-test mean achievement score of 12.87, representing a mean increase of 4.59 points. In contrast, students taught using the conventional teaching method (control group) had a pre-test mean achievement score of 8.33 and a post-test mean achievement score of 12.78, representing a mean increase of 4.45 points. The results indicate that both groups improved in achievement following instruction. However, the AI-assisted group recorded a slightly higher post-test mean achievement score (12.87) than the control group (12.78), giving a raw post-test mean difference of 0.09 points in favour of AI-assisted instruction.

➢ *Research Question 2:*

What is the effect of Artificial Intelligence-assisted instruction on students' interest in Basic Science and Technology in secondary schools in Imo State?

Table 2 Summary of Mean and Standard Deviation of Students' Mean Interest in Basic Science and Technology in Secondary Schools in Imo State.

PreACH PostACH PreINT PostINT * Method					
Method		PreACH	PostACH	PreINT	PostINT
AI-Asst	Mean	8.28	12.87	2.88	3.18
	N	60	60	60	60
	Std. Deviation	1.896	3.017	.242	.295
Control	Mean	8.33	12.78	2.67	1.84
	N	60	60	60	60
	Std. Deviation	1.481	2.498	.197	.141
Total	Mean	8.31	12.82	2.78	2.51
	N	120	120	120	120
	Std. Deviation	1.694	2.758	.243	.712

The descriptive statistics show that students in the AI-assisted group had a pre-test mean interest rating of 2.88 and a post-test mean interest rating of 3.18, indicating an increase of 0.30 points. Students in the control group had a pre-test mean interest rating of 2.67 and a post-test mean interest rating of 1.84, indicating a decrease of 0.83 points. The post-test results show that the AI-assisted group recorded a higher mean interest rating (3.18) than the

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control group (1.84), with a raw mean difference of 1.34 points in favour of AI-assisted instruction.

➢ *Research Question 3:*

What is the influence of gender on students' achievement in Basic Science and Technology when taught using Artificial Intelligence-assisted instruction?

Table 3 Summary of Mean and Standard Deviation of Students' Mean Achievement in Basic Science and Technology in Secondary Schools in Imo State Based on Gender.

PreACH PostACH PreINT PostINT * Gender					
Gender		**PreACH**	**PostACH**	**PreINT**	**PostINT**
Male	Mean	9.10	14.25	2.71	2.97
	N	20	20	20	20
	Std. Deviation	1.744	2.673	.197	.216
Female	Mean	7.88	12.18	2.97	3.28
	N	40	40	40	40
	Std. Deviation	1.856	2.969	.213	.275
Total	Mean	8.28	12.87	2.88	3.18
	N	60	60	60	60
	Std. Deviation	1.896	3.017	.242	.295

The descriptive statistics show that male students had a pre-test mean achievement score of 9.10 and a post-test mean achievement score of 14.25. Female students had a pre-test mean achievement score of 7.88 and a post-test mean achievement score of 12.18. The results indicate that male students obtained a higher post-test mean achievement score (14.25) than female students (12.18), giving a raw mean difference of 2.07 points in favour of male students.

➢ *Research Question 4:*

What is the influence of gender on students' interest in Basic Science and Technology when taught using Artificial Intelligence-assisted instruction?

Table 4 Summary of Mean and Standard Deviation of Students' Mean Interest in Basic Science and Technology in Secondary Schools in Imo State Based on Gender.

PreACH PostACH PreINT PostINT * Gender					
Gender		PreACH	PostACH	PreINT	PostINT
Male	Mean	9.10	14.25	2.71	2.97
	N	20	20	20	20
	Std. Deviation	1.744	2.673	.197	.216
Female	Mean	7.88	12.18	2.97	3.28
	N	40	40	40	40
	Std. Deviation	1.856	2.969	.213	.275
Total	Mean	8.28	12.87	2.88	3.18
	N	60	60	60	60
	Std. Deviation	1.896	3.017	.242	.295

The descriptive statistics show that male students had a pre-test mean interest rating of 2.71 and a post-test mean interest rating of 2.97. Female students had a pre-test mean interest rating of 2.97 and a post-test mean interest rating of 3.28. The results indicate that female students recorded a higher post-test mean interest rating (3.28) than male students (2.97), giving a raw mean difference of 0.31 points in favour of female students.

- *Hypothesis 1:*

There is no significant difference in the mean achievement scores of students taught Basic Science and Technology using Artificial Intelligence-assisted instruction and those taught using the conventional teaching method.

Table 5 Tests of Between-Subjects Effects

Dependent Variable: PostACH						
Source	**Type III Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	876.565[a]	4	219.141	876.275	.000	.968
Intercept	.268	1	.268	1.071	.303	.009
PreACH	741.234	1	741.234	2963.955	.000	.963
Method	.869	1	.869	3.476	.005	.029
Gender	1.268	1	1.268	5.071	.026	.042
Method * Gender	.196	1	.196	.784	.378	.007

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Error	28.760	115	.250			
Total	20643.000	120				
Corrected Total	905.325	119				
a. R Squared = .968 (Adjusted R Squared = .967)						

The ANCOVA results for post-test achievement show that the effect of teaching method was statistically significant, F(1,115)=3.476, p=.005, with a partial eta squared of .029. Since the reported significance value is below the 0.05 level, the result indicates a statistically significant difference in students' achievement scores between the two instructional methods after controlling for pre-test achievement and accounting for gender and the method-by-gender interaction.

- *Hypothesis 2:*

There is no significant difference in the mean interest ratings of students taught Basic Science and Technology using Artificial Intelligence-assisted instruction and those taught using the conventional teaching method.

Table 6 Tests of Between-Subjects Effects

Dependent Variable: PostINT						
Source	**Type III Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	56.026[a]	4	14.007	371.500	.000	.928
Intercept	1.394	1	1.394	36.974	.000	.243
PreINT	.563	1	.563	14.920	.000	.115
Method	36.565	1	36.565	969.841	.000	.894
Gender	.409	1	.409	10.858	.001	.086
Method * Gender	.207	1	.207	5.492	.021	.046
Error	4.336	115	.038			
Total	815.270	120				
Corrected Total	60.362	119				
a. R Squared = .928 (Adjusted R Squared = .926)						

The ANCOVA results for post-test interest indicate that the effect of teaching method was statistically significant, F(1,115)=969.841, p<.001, with a partial eta squared of .894. The significance value is below the 0.05 level, indicating a statistically significant difference in students' interest ratings between the two instructional methods after controlling for pre-test interest and accounting for gender and the method-by-gender interaction. The reported partial eta squared suggests a very large method-associated effect in this model.

IV. DISCUSSIONS

The resut of the findings of this investigation in line with the research questions and hypotheses are discussed here.

- *Efect of Artificial Intelligence-Assisted Instruction and Conventional Method on the Mean Students' Achievement in Basic Science and Technology in Secondary Schools in Imo State.*

The result of the descriptive statistics show that the posttest means of the two groups; conventional Artificial Intelligence-assisted instruction (AI-assisted group) are higher than the pretest means. However, the achievement mean gain in artificial intelligence group is higher with a value of 4.59 points. In contrast, students taught using the conventional teaching method (control group) had a mean gain of 4.45 points. The results indicate that both groups improved in achievement following instruction. However, the AI-assisted group recorded a slightly higher post-test mean achievement score (12.87) than the control group (12.78), giving a raw post-test mean difference of 0.09 points in favour of AI-assisted instruction. This finding conforms to the views of Russell & Norvig, 2021, that AI-assisted instruction has the potential to enhance students' understanding, motivation, engagement, and academic achievement by providing learning experiences tailored to individual needs. However, despite the increasing global adoption of AI in education, its application in the teaching of Basic Science and Technology in Nigerian secondary schools, particularly in Imo State, appears to be limited. Thus, Basic Science and Technology Education teachers in Imo State should be encouraged to adopt AI instruction in their teaching strategies.

- *Effect of Artificial Intelligence-Assisted Instruction and Conventional Method on the Mean Students' Interest Rating Score in Basic Science and Technology in Secondary Schools in Imo State.*

The descriptive statistics show that the posttest mean interest rating score of the two groups; AI-assisted and control group are higher than the pretest mean. However, the post-test results show that the AI-assisted group recorded a higher mean interest rating (3.18) than the control group (1.84), with a raw mean difference of 1.34 points in favour of AI-assisted instruction. This is an indication that students learning basic Science and Technology with AI-assisted instruction developed more interest than those in the control group. This finding agrees with Udoh and Anaekwe (2024) who reported that computer-aided instruction significantly improved students' achievement and interest in Integrated Science compared with conventional teaching methods.

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- *Influence of Gender on Students' Achievement in Basic Science and Technology When Taught Using Artificial Intelligence-Assisted Instruction.*

The result from the descriptive statistics show a raw mean difference of 2.07 points in favour of male students. This means that male students achieved better when exposed to computer aided instruction than female students. This finding is in contrast with the findings of Umoru and Zainaba (2026) who examined ChatGPT-assisted instruction and academic performance in Genetics among Senior Secondary II Biology students in Jalingo, Taraba State. The findings indicated that students taught using ChatGPT performed significantly better than those taught through conventional instruction. The researchers also found no statistically significant difference between male and female students exposed to ChatGPT-assisted instruction. The results suggest that AI-assisted learning can support achievement without necessarily producing a gender advantage.

- *Influence of Gender on Students' Interest in Basic Science and Technology when Taught Using Artificial Intelligence-Assisted Instruction.*

The result from the descriptive statistics indicate that female students recorded a higher post-test mean interest rating (3.28) than male students (2.97), giving a raw mean difference of 0.31 points in favour of female students. This finding agrees with Njoku, Inah, and Emeka (2026) who investigated the effect of an AI-integrated teaching method on students' interest and academic achievement in Mathematics in Aba Education Zone, Abia State. The study reported significant improvements in both academic achievement and interest among students taught through the AI-integrated method. This is useful evidence because it examines interest as a measurable learning outcome rather than focusing solely on test performance. However, the abstract available does not establish whether male or female students recorded higher interest scores or whether the intervention affected the two groups differently.

V. CONCLUSIONS

The following conclusions were drawn from the results of the findings. Students taught Basic Science and Technology with AI-assisted instruction achieved better than those taught with conventional method and equally showed a higher interest. However, female students had a higher mean gain.

RECOMMENDATIONS

- Basic Science and Technology teachers should incorporate the use of artificial intelligence in instructional delivery
- Male students should be encouraged to develop more interest in learning through the digital technologies.

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