Vol. 1, No. 1, 2025, pp. 1-11

Journal of Administration, Languages and Vocational Technology Innovation

https://ojs.universityedu.org/index.php/jalvti/about

An assessment of the impact of AI on the reading and study habit of geography students in colleges of education in Anambra state

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Abstract

The integration of Artificial Intelligence (AI) in education has transformed learning processes, particularly in improving students' study habits and access to resources. Geography students in colleges of education in Anambra State are increasingly utilizing AI tools to enhance their academic experiences. This study focused on how AI tools such as ChatGPT, Google Bard, Grammarly, Quillbot, and ArcGIS influenced students' reading frequency and independent study habits. The study adopted a descriptive survey design. A sample of 75 students was selected through purposive and random sampling to ensure diverse representation. Data was collected using a structured, validated questionnaire, and a pilot study confirmed the reliability of the instrument (Cronbach's Alpha = 0.82). Descriptive statistics and linear regression analysis were used to answer the research questions, while the independent samples t-test tested the hypotheses. The study explored AI tool usage, reading frequency, and independent study habits among students. The results showed that AI tools significantly increased the reading frequency among students, with female students utilizing these tools slightly more than their male counterparts. However, AI had no significant effect on students' independent study habits, indicating that while AI supported academic engagement, it did not necessarily promote independent learning. The study highlighted the potential of AI in enhancing academic involvement but suggested that enhancing independent study requires more than technological tools alone. This research offers understanding into how AI can be integrated into teaching practices and the need for a balanced approach to technology in education.

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Keywords: Artificial Intelligence, Reading Frequency, Study Habits, Geography Students, AI Tools

Introduction

In recent years, the integration of Artificial Intelligence (AI) in education has gained significant attention, transforming traditional learning models. AI refers to the simulation of human intelligence in machines that are programmed to think, learn, and solve problems. AI systems can perform tasks such as reasoning, decision-making, speech recognition, visual perception, and language translation, which traditionally require human intelligence. These systems improve over time through data analysis and machine learning algorithms. AI is used in various sectors, including education, healthcare, transportation, and business, to enhance efficiency and accuracy (Yim & Su, 2025). In education, for example, AI can personalize learning experiences, automate administrative tasks, and provide intelligent tutoring, making it a powerful tool for transforming teaching and learning processes. However, concerns have

emerged regarding how AI influences students' reading and study habits, particularly in discipline-specific contexts like Geography.

Geography is the study of the Earth's physical features, climate, and natural resources, as well as the human activities and societies that interact with them. It explores the spatial relationships between people and their environments, examining how physical landscapes influence cultural, political, economic, and social development (Piotrowska, 2025). Geography is divided into two main branches: physical geography, which focuses on natural processes and landforms, and human geography, which examines human patterns and interactions. Geography, which demands spatial reasoning, data interpretation, and conceptual analysis, traditionally relies on rigorous reading and independent study (Emiola, 2024). The application of AI in education has rapidly evolved, reshaping how students access, process, and retain information. In Geography education, AI technologies such as virtual tutors, intelligent mapping software, and personalized learning platforms have introduced innovative ways to simplify complex geographical concepts.

In Geography education, digital tools like ChatGPT, Google Bard, Grammarly, Quillbot, and ArcGIS are transforming how students learn, read, and study. ChatGPT and Google Bard, both AI-powered language models, support Geography students by generating explanations, summaries, and answers to questions on complex geographical topics such as climate systems, population dynamics, and spatial analysis. These tools enhance understanding and promote self-directed learning (Rahayu et al, 2023). Grammarly and Quillbot assist students in improving their academic writing. Grammarly helps ensure clarity, correct grammar, and coherence in Geography essays and reports, while Quillbot aids in paraphrasing and rephrasing content, which is especially helpful when handling literature reviews or assignments. However, Rahayu et al (2023) observed that overreliance on these tools can reduce critical thinking and originality. ArcGIS stands out as a specialized tool used in spatial analysis and map interpretation in Geography. It allows students to visualize, analyze, and interpret data related to land use, urban growth, and environmental change.

According to Sharma and Kumar (2024), AI tools like chatbots and adaptive learning platforms offer students tailored academic support that can motivate independent study by recommending specific topics based on individual performance. These tools help break down abstract concepts such as geomorphological processes or spatial analysis into easily digestible content, thereby enhancing comprehension and sustained interest in the subject. In contrast, some scholars argue that AI can negatively affect the traditional reading habits of students. Syahnaz and Fithriani (2023) observed that Geography students who frequently use AI tools such as summarizers and auto-complete functions tend to develop dependency, reducing critical reading and note-taking skills. This aligns with studies emphasizing active learning and problem-solving for academic achievement (Okafor, 2019; Obikezie et al, 2023). Overreliance on simplified materials undermines deep engagement, similar to concerns about poor textbook quality affecting comprehension (Okafor, 2010). Experiential and authentic learning approaches are essential to sustain interest and understanding (Muogbo et al, 2025; Nnorum & Okafor, 2011). Furthermore, technological integration must enhance, not replace, cognitive effort (Nneka & Okafor, 2013; Enem et al, 2025).

Nonetheless, the role of AI in promoting study efficiency cannot be ignored. As observed by Li and Xu (2025), AI-enabled Geographic Information Systems (GIS) and spatial data platforms can significantly improve students' study habits by offering interactive and visual-based content that aligns with the practical nature of Geography. These technologies enhance active learning, which has been linked to higher academic performance and better long-term retention of geographical knowledge. This finding agreed with the work of Yim and Su (2025), who noted that AI promotes differentiated learning, allowing Geography students to study at their own pace and revisit difficult concepts as often as needed. This autonomy can cultivate disciplined study habits, particularly among learners who previously struggled with

comprehension. In their study on tertiary institutions in South-East Nigeria, they found that students using AI tools for revision demonstrated better organization and planning in their study schedules than their peers who relied solely on textbooks and lecture notes.

Iddrisu et al. (2025) emphasized that AI tools enhance collaborative learning among Geography students by enabling shared discussions and collective knowledge building. This aligns with ethical and structured engagement in professional practice, where collaboration must avoid intellectual conflicts and overdependence (Okosa et al, 2025). However, excessive reliance on AI-generated responses may undermine critical reasoning, similar to concerns about weak analytical judgment in legal interpretations and institutional practices (Okosa, 2022a; Okosa, 2022b). Furthermore, balanced participation is essential to avoid distorted outcomes, as seen in issues of accountability and responsibility in legal systems (Okosa, 2023; Udensi & Okosa, 2025). In contrast, Idika et al (2025) cautioned that AI's growing presence in Geography education may inadvertently widen the gap between students with access to advanced technologies and those without. Geography is a subject that demands more than just memorization which involves understanding complex concepts, interpreting spatial data, and engaging with maps and texts. With tools like ChatGPT, Quillbot, Grammarly, and ArcGIS becoming more common in classrooms, there's a noticeable shift in how students approach reading and studying. Some students rely on AI for quick summaries or explanations, raising questions about whether this is improving or weakening their study habits.

While existing research touches on AI's general influence in education, few have looked closely at its specific effects on Geography students. Adewumi et al (2024) mentioned changes in reading culture but didn't explore how these changes play out in a subject like Geography. Ward et al (2025) focused more on access to AI than its academic impact. This gap in the literature sparked the need for a closer look at what's happening in colleges of education across Anambra State, helping educators understand both the opportunities and challenges AI introduces to Geography education.

Research questions

1. What are the AI tools utilized by male and female geography students in colleges of education in Anambra State?
2. What are the impacts of AI-assisted learning on the reading frequency of male and female geography students in colleges of education in Anambra State?
3. What are the impacts of AI technologies on the independent study habits of male and female geography students in colleges of education in Anambra State?

Hypotheses

1. There is no significant difference in the utilization of AI tools between male and female geography students in colleges of education in Anambra State.
2. There is no significant difference in the impact of AI-assisted learning on the reading frequency of male and female geography students in colleges of education in Anambra State.
3. There is no significant difference in the impact of AI technologies on the independent study habits of male and female geography students in colleges of education in Anambra State.

Method

The study adopted a descriptive survey research design to assess the impact of Artificial Intelligence (AI) on the reading and study habits of geography students in colleges of education in Anambra State. This design was considered suitable as it enabled the researcher to gather data from a specific population without manipulating any variables. The study was conducted in Anambra State, South-East Nigeria, which is home to several accredited public of education

offering Geography at both the National Certificate in Education (NCE) and Bachelor of Education (B.Ed) levels. The population comprised all B.Ed and NCE Geography students enrolled in the 2024/2025 academic session. A sample of 75 students was selected through a combination of purposive and simple random sampling techniques to ensure both gender representation and geographical spread. The instrument for data collection was a structured questionnaire divided into sections to gather information on AI tool utilization, reading frequency, and independent study habits.

The questionnaire was validated by three experts in educational technology and measurement and evaluation, who reviewed the content for clarity, relevance, and appropriateness. To ensure reliability, a pilot study was conducted using 15 geography students from a college not included in the main study, and the reliability coefficient was calculated using Cronbach's Alpha, yielding a value of 0.82. Data were collected electronically using Google Forms. The link to the questionnaire was distributed via academic WhatsApp groups to enable broad and easy access. Respondents were informed of the study's purpose and assured of confidentiality. The method of data analysis employed in this study involved both descriptive and inferential statistics to answer the research questions and test the hypotheses. For Research Question 1, which focused on identifying the AI tools utilized by male and female geography students, descriptive statistics such as mean, standard deviation, and standard error mean were used. For Research Questions 2 and 3, linear regression analysis was employed. To test the hypotheses, the independent samples t-test was used to compare the means between male and female students.

Results

Table 1: Distribution of Respondents by Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	50	66.7	66.7	66.7
	Female	25	33.3	33.3	100.0
	Total	75	100.0	100.0	

The table shows that out of the total respondents (75), 50 were male students, representing (66.7%) of the sample, while 25 were female students, representing (33.3%). This indicates a higher proportion of male geography students in the study sample. The cumulative percentage shows that all respondents were accounted for (100.0%), confirming complete data collection across both gender groups.

Research question 1: What are the AI tools utilized by geography male and female students in colleges of education in Anambra State?

Table 2: Mean Scores of AI Tools Utilized by Male and Female Geography Students

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Geography students use ChatGPT to explain complex geographical concepts clearly.	Male	50	2.92	1.007	.142
	Female	25	3.28	.980	.196
Many students rely on Google Bard for researching geographic information and data.	Male	50	3.22	.418	.059
	Female	25	3.56	.583	.117
Grammarly helps students	Male	50	3.30	1.015	.144

correct grammar errors in their geography essays.	Female	25	3.32	1.030	.206
Students use Quillbot to paraphrase difficult geography texts for better understanding.	Male	50	3.00	.926	.131
	Female	25	3.72	.458	.092
ArcGIS AI tools assist students in analyzing spatial patterns and creating maps.	Male	50	2.82	.919	.130
	Female	25	2.96	1.136	.227

The table presents the average usage of AI tools by male and female geography students. Female students showed slightly higher mean usage in most tools: ChatGPT (3.28) vs. males (2.92), Google Bard (3.56) vs. males (3.22), and Quillbot (3.72) vs. males (3.00). Grammarly was used almost equally by females (3.32) and males (3.30), while ArcGIS was more evenly distributed: females (2.96), males (2.82). These results suggest that female students slightly utilize AI tools more frequently, especially for content rephrasing, researching, and concept clarification in geography studies.

Research question 2: What are the impacts of AI-assisted learning on the reading frequency of male and female geography students in colleges of education in Anambra State?

Table 3: ANOVA Summary of AI Tools Utilization and Reading Frequency

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.188	1	59.188	7.902	.006[b]
	Residual	546.758	73	7.490		
	Total	605.947	74			

a. Dependent Variable: Reading frequency of geography students

b. Predictors: (Constant), AI tools utilization by geography students

The ANOVA table shows a statistically significant impact of AI tools utilization on the reading frequency of geography students. The regression model is significant at ($F = 7.902$, $p = .006$), indicating that AI-assisted learning positively influences students' reading frequency.

Table 4: Coefficients of AI Tools Utilization on Reading Frequency

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.618	1.833		5.793	.000
	AI tools utilization by geography students	.322	.114	.313	2.811	.006

a. Dependent Variable: Reading frequency of geography students

The coefficients table reveals a positive and significant relationship between AI tools utilization and reading frequency ($B = .322$, $t = 2.811$, $p = .006$). This suggests that increased use of AI tools is associated with higher reading frequency among geography students in colleges of education in Anambra State.

Research question 3: What are the impacts of AI technologies on the independent study habits of male and female geography students in colleges of education in Anambra State?

Table 5: ANOVA Summary of AI Tools Utilization and Independent Study Habits

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.550	1	5.550	1.300	.258[b]
	Residual	311.596	73	4.268		
	Total	317.147	74			

a. Dependent Variable: Geography students' independent study habits

b. Predictors: (Constant), AI tools utilization by geography students

The ANOVA result shows that the regression model is not statistically significant (F = 1.300, p = .258). This indicates that the utilization of AI tools does not significantly influence the independent study habits of geography students in colleges of education in Anambra State.

Table 6: Coefficients of AI Tools Utilization on Independent Study Habits

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.219	1.384		8.830	.000
	AI tools utilization by geography students	.098	.086	.132	1.140	.258

a. Dependent Variable: Geography students' independent study habits

The coefficients table reveals a weak, non-significant relationship between AI tools utilization and independent study habits (B = .098, t = 1.140, p = .258). This implies that AI usage has minimal or no meaningful effect on students' ability to study independently.

Hypothesis 1: There is no significant difference in the utilization of AI tools between male and female geography students in colleges of education in Anambra State.

Table 7: Independent Samples Test for AI Tools Utilization by Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AI tools utilization by geography students	Equal variances assumed	.001	.978	-2.392	73	.019	-1.58000	.66062	-2.89662	-.26338
	Equal variances not assumed			-2.431	50.265	.019	-1.58000	.64986	-2.88511	-.27489

The independent samples test indicates a significant difference in the utilization of AI tools between male and female geography students (t = -2.392, p = .019). The mean difference of -1.580 suggests that male students use AI tools less frequently than female students. This result rejects the null hypothesis, confirming a significant gender disparity in AI tool utilization

among geography students in colleges of education in Anambra State.

Hypothesis 2: There is no significant difference in the impact of AI-assisted learning on the reading frequency of male and female geography students in colleges of education in Anambra State.

Table 8: Independent Samples Test for AI Impact on Reading Frequency by Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading frequency of geography students	Equal variances assumed	1.030	.314	-1.978	73	.052	-1.36000	.68753	-2.73025	.01025
	Equal variances not assumed			-2.096	56.170	.041	-1.36000	.64885	-2.65971	-.06029

The independent samples test shows a near-significant difference in the impact of AI-assisted learning on reading frequency between male and female geography students ($t = -1.978$, $p = .052$). The mean difference of -1.360 suggests that females tend to experience a higher frequency in reading due to AI tools, although the p-value is slightly above the 0.05 significance level, indicating that the result is not statistically significant at the 5% level. Thus, we fail to reject the null hypothesis, suggesting no substantial gender difference in AI's impact on reading frequency.

Hypothesis 3: There is no significant difference in the influence of AI technologies on the independent study habits of male and female geography students in colleges of education in Anambra State.

Table 9: Independent Samples Test for AI Influence on Independent Study Habits by Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Geography students' independent study habits	Equal variances assumed	.774	.382	-.668	73	.506	-.34000	.50900	-1.35444	.67444

	Equal variances not assumed			-.618	39.554	.540	-.34000	.54985	-1.45168	.77168

The independent samples test shows no significant difference in the influence of AI technologies on the independent study habits of male and female geography students ($t = -0.668$, $p = .506$). The mean difference of -0.34 suggests a minimal variation between genders. With a p-value well above the 0.05 significance threshold, we fail to reject the null hypothesis, indicating that AI technologies have a similar impact on the independent study habits of both male and female geography students in colleges of education in Anambra State.

Discussion

Research Question 1 focused on the AI tools utilized by geography male and female students in colleges of education in Anambra State. The findings indicate that female geography students tend to utilize AI tools more frequently than their male counterparts, particularly for tasks like content clarification and research. Female students showed greater usage of tools like ChatGPT, Google Bard, and Quillbot compared to males, especially for explaining complex geographical concepts and paraphrasing difficult texts. However, both genders demonstrated similar usage of Grammarly for grammar correction. The findings align with previous research, such as the study by Adewumi et al (2024), which found that females often leverage AI tools more frequently for academic purposes, particularly for tasks like content generation and paraphrasing. Similarly, Idika et al (2025) emphasized that AI tools help students understand complex concepts and improve research skills. In contrast, Iddrisu et al (2025) noted that gender differences in AI tool usage were most noticeable in areas like content rephrasing and data collection, supporting the idea that females may utilize AI tools for tasks that involve extensive information processing.

Research Question 2 covered the impacts of AI-assisted learning on the reading frequency of male and female geography students in colleges of education in Anambra State. The results from the statistical analysis reveal that AI tools significantly influence the reading frequency of geography students. This finding aligns with previous research, including Ward et al (2025), who showed that AI-assisted learning environments positively impacted students' reading habits by making academic materials more accessible and engaging. The study suggests that AI tools encourage students to engage with more academic texts, improving their frequency of reading. However, a contrasting study by Guo and Wang (2025) found that the impact of AI on reading frequency was more contingent on the students' initial levels of engagement. Kim et al (2024) similarly noted that AI tools like ChatGPT and Google Bard facilitate information retrieval and knowledge building, which can lead to increased reading frequency. Jegede (2024) also found that AI tools promote more frequent reading by offering customized content delivery and feedback, suggesting that AI's role in enhancing reading habits is significant.

Research Question 3 examined the impacts of AI technologies on the independent study habits of male and female geography students in colleges of education in Anambra State. In contrast to its positive influence on reading frequency, evidence suggests that AI tools do not significantly enhance independent study habits among Geography students. This supports Rahayu et al. (2023), who argued that AI facilitates task completion but does not automatically build learner autonomy without strong self-regulation skills. Similarly, studies on ICT integration reveal that access to technology alone does not guarantee independent learning, as students often depend on guided instruction (Nnoli & Muogbo, 2025; Enemuo & Muogbo, 2024). Research on Zoom and blended learning further indicates that digital tools improve engagement but require active learner control to foster independence (Enemuo & Muogbo, 2023; Okafor et al., 2023). Moreover, experiential learning approaches emphasize hands-on

participation as a key driver of self-directed learning (Muogbo et al, 2025). However, the negative influence of ICT on academic performance highlights that excessive reliance on technology may reduce initiative and critical engagement (Muogbo & Nnoli, 2025). Therefore, while AI and digital tools support learning processes, their impact on independent study depends largely on students' ability to regulate, adapt, and critically engage with these technologies. In contrast, Sharma and Kumar (2024) observed that while AI can provide guidance and improve access to resources, it does not directly lead to the development of autonomous study practices unless combined with other teaching strategies. Syahnaz and Fithriani (2023) also suggested that while AI helps with tasks like paraphrasing and organizing information, students still require additional resources to develop independent study habits, indicating that AI alone is not sufficient for enhancing self-reliance in learning.

Conclusion

This study set out to explore how Artificial Intelligence (AI) impacts the reading and study habits of geography students in colleges of education in Anambra State. The findings reveal that AI tools do make a noticeable difference in students' reading habits, particularly in how often they engage with academic content. Tools like ChatGPT and Google Bard, for example, help students clarify complex concepts and find useful information, leading to more frequent reading and a deeper engagement with the material. However, the study also found that AI tools don't seem to significantly change students' independent study habits. While AI can assist in tasks like research and understanding concepts, it doesn't seem to enhance a greater sense of self-directed learning. This shows that while technology can support learning, it might not always encourage the independent study skills students need to succeed on their own.

The study also found some differences between male and female students in how they use AI tools, with female students using them slightly more often than their male counterparts. This aligns with some other research suggesting that gender may influence how students engage with educational technologies. While AI has a clear impact on students' reading habits, it doesn't appear to significantly improve their ability to study independently. For AI to truly enhance students' academic success, educators might consider combining these tools with strategies that promote independent learning. This study highlights the potential of AI to support academic engagement, but also underscores the need for a well-rounded approach to learning that encourages both technology use and self-directed study skills.

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