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Generative Ai And The Crisis Of Critical Thinking: Implications For Student Learning And Skill Development – A Study Of Auchi Polytechnic, Edo State, Nigeria

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Abstract: *The study investigated AI usage and Critical Thinking Skills of Higher National Diploma (HND) students in Auchi Polytechnic. The study was descriptive survey with the polytechnic HND I and HND II students as the population of the study. A stratified random sampling technique was used to select 380 respondents, and a structured questionnaire called 'Generative AI and Critical Thinking Questionnaire (GAICTQ)' was given to the respondents. The instrument was reliable with a reliability coefficient of 0.86. Descriptive statistics (mean and standard deviation) were used to describe the data and Pearson's Product Moment Correlation was used to test the hypotheses. The students' use of generative AI tools for academic work was frequently observed, with a grand mean of 3.31. However, students felt their own critical thinking was falling, such as their ability to analyse problems independently (3.40). The frequency of using AI was positively correlated with participants' perceptions of a reduction in critical thinking skills (r = 0.568, p = 0.001). The researchers found that generative AI has potential advantages for learning, but that its excessive use could affect the cultivation of critical thinking skills. It was recommended that among others, educators should incorporate critical thinking exercises in the assisted learning by AI.*

Keywords: Generative AI, Critical Thinking, Student Learning, Skill Development, Auchi Polytechnic

Introduction

From ChatGPT to Google Bard and Microsoft Copilot, and now to Perplexity.ai, generative artificial intelligence (AI) has become a regular component of the lives of students from all over the world. These tools can create essays and answer questions, solve problems, and brainstorm ideas all within seconds. For the students, it is that academic work that used to tax their brain and required hours of effort can now be accomplished with a few clicks (OpenAI, 2023). This has so many advantages, but also many questions about the future of learning, and how to cultivate critical thinking skills.

Critical thinking is the process of thinking clearly, analysing information, evaluating arguments and making reasoned judgments. It's one of the most critical skills that students must master to excel in school and in life. In the problem-solving, decision-making and world-changing aspects, both employers and educators concur that critical thinking is a key factor (Dwivedi *et al.*, 2023). The expectation of the higher education institutions in Nigeria is to produce graduates with critical thinking abilities who can help the country to develop (Adeshola and Adepoju, 2023).

But with the rise in the use of generative AI, there is also increasing worry about the impact on students' thinking skills. Students may not engage in the thinking skills required to develop critical thinking skills when using AI to respond to questions and complete work tasks. They do not dissect a problem, they take what is offered them by AI. They believe or trust that AI-generated content is accurate and don't question it, without assessing its sources (Oyelude, 2023; Tlili *et al.*, 2023). This worry is echoed by Valcea, Hamdani and Wang (2024) who warn AI may have a dangerously negative impact on students' ability to think critically, as they become so dependent on the technology that they no longer have to think about simple problems. Likewise, a systematic review of Deng *et al.* (2024) that compiled 67 empirical studies revealed that ChatGPT can be used to enhance children's cognitive development if it is integrated into inquiry-based instructional models, but when it is used in an unstructured way, it may lead to cognitive offloading and a reduction in children's critical and creative capabilities.

Cognitive offloading, or delegating a thinking process to external tools, is seen as a major problem in the AI-enabled learning context (Chen and Chang, 2024). While students can use ChatGPT to get answers without critical thinking or to write entire texts, they will omit the very thinking process that develops and enhances critical thinking (Correia *et al.*, 2024). This may result in superficial learning, and a gradual loss of independent analytical skills (Abbas *et al.*, 2024). Additionally, there are indications that a high level of trust in the use of AI is negatively associated with the application of critical thinking by the user, indicating that intellectual harm may result from irrational use of the tool (Lee and Tseng, 2025).

This issue isn't a theoretical one. Here are some interesting findings regarding how students use AI tools to complete assignments without actually learning the content. The research reveals some fascinating insights into how students are using AI to complete assignments without really learning the content. Enoghase and Ogbeide (2025) discovered that students of the Ambrose Alli

University were much involved with ChatGPT in their academic endeavors, such as research topic, understanding of difficult concepts, and academic assignments. But the study also revealed that students feared relying too heavily on AI and their loss of independence in thinking. Other researchers have found that using AI too much can cut down on cognition and stifle analytical abilities (Mollick and Mollick, 2023; Kasneci *et al.*, 2023).

Auchi Polytechnic is among the best tertiary institutions in Edo State, Nigeria. It provides Engineering, Technology, Business and environmental studies programmes. The Polytechnic offers the following programmes: National Diploma (ND) and Higher National Diploma (HND). Students who have completed their HND studies are in their final year of polytechnic studies and should have excellent practical and analytical skills. HND II students and HND I students are working on more complex project and assignments which involve their higher levels of thinking and problem solving. This is why this is an important group to examine in the context of the impact of AI on critical thinking (UNESCO, 2023).

The study thus investigates the relationship between the use of generative AI and critical thinking of the students at HND I and HND II of Auchi Polytechnic. It aims to develop a deeper understanding of the impact that AI tools are having on students' learning and skill development and how this can be supported so that learners do not have technology replacing critical thinking skills.

The organization of this article is as follows: the next section presents the statement of the problem and after this will be listed the research questions and objectives. After the theoretical framework and literature review of empirical studies are presented, the methodology and results are explained, followed by a discussion of the results, conclusion and recommendations.

Statement of the Problem

Critical thinking is a basic skill that is essential to the learning of students and in their future work. The inability of graduates to possess analytical and problem solving skills in the workplace is a common complaint of educators and employers in Nigeria (Okonkwo and Ade-Ibijola, 2021). Meanwhile, the number of generative AI tools has grown significantly and students are using them to complete their academic assignments, which could limit opportunities for students to engage in deeper thinking.

The issue is, students could be working using AI to finish assignments, and miss out on the cognitive processes needed to build critical thinking skills. For instance, a student types an essay question into AI, but doesn't have to think about organising their ideas, building their arguments, and assessing their evidence. They do not reason through the steps when using AI to solve a problem. This may cause a deterioration in the very skills that education is supposed to impart over time (Oyelude, 2023; Zhai, 2022).

The students at Auchi Polytechnic are undergoing training for technical and professional courses in HND. The ability to think critically would have significant repercussions. Often graduates will not be able to think critically and will not be able to solve problems and make decisions in employment. This is not only a problem for the students but for the organisations that employ them and the economy in general (Akinwalere and Ivanov, 2022).

The concern is rising but limited research has been conducted to see how the use of generative AI has impacted critical thinking of HND students in Nigerian polytechnics. Majority of studies have been conducted on universities while very few have considered the particular context of polytechnic education, which focuses on the practical skills and hands on learning (Adarkwah, 2021). This study tries to fill this void, and it is based on the HND I and II students of Auchi Polytechnic.

Research Questions

This study raises the following research questions:

1. How much are HND students of Auchi Polytechnic using generative AI tools in their academic pursuits?
2. How does students' critical thinking skills seem to be affected by their use of generative AI?
3. What are some of the challenges students face in retaining their critical thinking skills with the use of generative AI?

Objectives of the Study

This study aims at investigating the relationship between the use of generative AI and critical thinking skills in HND students of Auchi Polytechnic. The study sets to do the following:

To find out how often HND students of Auchi Polytechnic are using generative AI tools in their academic activities.

2. Evaluate how students think generative AI use impacts their critical thinking.
3. Understand the difficulties students encounter in developing and sustaining their critical thinking skills with the use of generative AI.

Research Hypotheses

Based on the above concepts and the available literature, the following hypotheses are formulated for the study:

1. There is no clear relationship between students' reported deterioration in critical thinking and frequency of generative AI use.
2. The perceived decline in critical thinking among students is not significantly different when using AI to complete assignments compared to learning support.
3. No significant correlation between availability of AI use guidance and students' ability to hold onto critical thinking skills.

Theoretical Framework

This study is based on Piaget's (1952) Theory of Cognitive Development which states the stages of thinking as people interact with their environment. Learning takes place when people work with problems, reflect on experience and build knowledge, according to Piaget. Active engagement is the process that is crucial for the development of critical thinking. The theory of piaget is applicable to this study because mental effort in learning is emphasized. Students seeking rapid responses with generative AI may avoid the

thinking through of problems, reflecting on ideas, and building their own understanding. This may make it hard for them to advance to the next stages of cognitive development.

Additionally, the theory provides insights on the potential negative impact of excessive dependency on AI on critical thinking. Students will never engage in all the mental functions that build cognitive capacity if they always let AI handle it for them. This, over time, can result in poor analytical skills and problem solving capacity (Akinwalere and Ivanov, 2022). This study, in adopting Piaget's theory, can better understand the impact of the use of generative AI on the cognitive development of HND students at Auchi Polytechnic and how to ensure the use of AI does not hinder but assist learning.

Review of Empirical Literature

How can Generative AI be used to promote critical thinking? What are global perspectives on generative AI and critical thinking?

There have been several studies that explored the connection between Generative AI and critical thinking, from a global perspective. Adeshola and Adepoju (2023) explored the possibility of human-AI collaboration in the field of educational innovation and suggested that the teachers play a crucial role in students' utilization of AI to enhance thinking processes. They warned that if not taught correctly, students can be "passive recipients" of AI-generated information rather than "active thinkers. Kasneci *et al.* (2023) discussed the opportunities and challenges of large language models in education. They pointed out that while AI can aid in personalised learning and lessen cognitive burden, there is a possibility that pupils could use AI without engaging in independent thinking. The authors urged the inclusion of AI literacy in curricula, so that students can use AI tools in a critical manner.

Mollick & Mollick (2023) investigated the possibilities for enhancing teaching and learning through the use of AI. They stressed that AI is a 'co intelligence' that should spur students to think, question, and improve their ideas, not just plagiarise the results from AI. Their results indicate that how they are used is a key issue to keeping them cognitively engaging. OpenAI (2023) offers a technical background of ChatGPT and spells out its strengths and weaknesses. The company encourages the users to crosscheck AI generated information and to use AI as a supplementary tool to human reasoning.

Oyelude (2023) explored the attitude of libraries and librarians towards ChatGPT. The study revealed that AI tools can be useful for accessing and accessing information, but there are concerns about over-reliance on AI and the quality of information provided by AI. The importance of critical evaluation skills for users, whether dealing with AI tools or not, was emphasized by Oyelude. UNESCO (2023) published a global guidance document on generative AI in education, which calls for caution in its use to avoid having a negative impact on critical thinking, creativity and authentic learning. The report recommended the development of policies and teachers' training, to guarantee the responsible integration.

Systematic Reviews and Meta-Analyses.

New systematic reviews have been conducted to give a full picture of the effects of generative AI on critical thinking. Based on a systematic review of 67 empirical studies from 2022 to 2025, Deng *et al.* (2024) discovered that ChatGPT can be used to aid in cognitive development when part of inquiry oriented and scaffolded instructional designs, particularly in metacognitive regulation, argumentative reasoning, and idea generation. Researchers did see, however, that in unstructured environments there were asymmetrical trends that led to greater creativity than critical thinking as well as declines overall in both domains, with the latter frequently leading to cognitive offloading.

Zhang *et al.* (2025) conducted another systematic review of the impact of ChatGPT on critical thinking skills and dispositions that included 65 high quality empirical studies. The review concluded that, if integrated properly, ChatGPT can be a support to improve students' analytical, interpretive, reasoning and self regulatory skills. Yet, there is still little evidence of its development of dispositions related to critical thinking (truth seeking, openness and systematicity) that is consistent and significant. The authors found that the teaching in the future should move beyond the level of just ‘how to critique' to making students want to and feel responsible for critical thinking.

Manfield, Hawkesby and Nucifora (2025) conducted a systematic mapping study of the research on the impact of GenAI on the link between academic writing and critical thinking in Higher Education. The study included 25 peer reviewed studies from 2023 to 2025 and revealed that there's a worldwide trend to use GenAI tools in academic writing across all disciplines and levels of higher education. Few studies, however, were based on sound theory. The usefulness of GenAI in the process of writing was thought to be positive, with the possibility of facilitating or inhibiting critical thinking being debated.

The Cognitive Offloading Phenomenon

There are many reasons to believe that this is the Cognitive Offloading Phenomenon. One of the key frameworks that have come forward in the context of the risks of generative AI in education is that of cognitive offloading. Cognitive offloading has become a vital concept in the discourse on the hazards of generative AI in education. Students' reliance on external tools to carry out important thinking tasks, thereby avoiding deep and reflective thinking is a phenomenon investigated by Chen and Chang (2024). Students who use ChatGPT to search for direct answers or make a whole text without thinking critically ultimately take away the very thinking processes of developing and nurturing critical thinking.

This can result in a less deep knowledge and a progressive loss of the learner's critical thinking skills, as pointed out by Correia *et al.* (2024). Abbas *et al.* (2024) also found a strong negative relationship between the user's high level of confidence in the tool and the use of critical thinking, indicating that a high level of confidence in the tool is detrimental to the user's critical thinking.

Students' concerns about the adverse impacts of AI are well documented, and are consistent with the concept of cognitive offloading, as discovered by Lee and Tseng (2025). The chances of ChatGPT promoting or impeding critical thinking depend on its pedagogical context. When the teacher imparts knowledge to the student and teaches him/her how to interpret the tool in a critical and strategic manner, positive results are more likely. The default tendency, however, may be to go with the path of least resistance in the mind when using it unguided.

The integration of Generative AI into Higher Education Learning Outcomes:

To explore the assessment and learning outcomes for generative AI in higher education, a scoping review by Li *et al.* (2024) was conducted. The review found that educators and researchers have many varied concerns regarding student assessment in the higher education GenAI context, such as how to assess students' learning and the new (refocused) learning outcomes that emerged in GenAI facilitated learning environments. The new, refocused learning outcomes that were identified were career driven competencies and lifelong learning skills.

Valcea, Hamdani and Wang (2024) discussed three paradoxes of ChatGPT in business school education: the 'Expertise Paradox' suggests that AI's sufficient performance at lower level tasks might undermine higher level thinking skills; the 'Innovation Paradox' proposes that AI's creative assistance may impede original thinking; and the 'Equity Paradox' points to the fact that the benefits of AI could be far greater for those with mastery of the subject and much less for novices. The authors warned of possible "deskilling" in the critical thinking skills as students become overly dependent on AI for simple tasks.

Manfield, Hawkesby and Nucifora (2025) tested the use of generative AI to support instead of undermining critical thinking in the higher education context. The study was carried out with 88 undergraduate students from five topic clusters in a Digital Innovation course at the University of Queensland. Students were encouraged to engage with a GenAI tool in a transparent manner for the purposes of creating and moderating student resources and completing case studies and debates. The study proposed that the GenAI could be a 'bicycle for the mind' to improve critical thinking from a constructive perspective when adopted in tertiary education teaching practice.

African and Nigerian Perspectives

The scholarship on the intersections of generative AI and critical thinking in the African context of higher education is still nascent and relatively limited. Adarkwah (2021) conducted a study on the use of ICT in Ghana after Covid 19 and pointed out some of the negative and positive cases of using ICT in education. Although technology provides benefits, there is concern about its impact on critical thinking and authentic learning, the study said. Similarly, Okonkwo and Ade-Ibijola (2021) performed a systematic review of the application of chatbots in education in the Nigeria context, and concluded that although chatbots have great potential in improving learning, issues of over reliance and information quality remain. The authors urged more studies on the didactic implications of the use of AI tools in higher education in Nigeria.

Enoghase and Ogbeide (2025) assessed the Academic Research capabilities of ChatGPT among Undergraduate Students of Ambrose Alli University, Ekpoma, Edo State. They employed a descriptive survey design with 350 respondents and discovered that the most frequent uses of ChatGPT by students are for research topics, grasping complex concepts, and academic assignments. Most significantly, they discovered that there was a concern that students would become reliant on AI and lose the capacity to think for themselves. This directly reinforces the aim of the present study. Akinwalere and Ivanov (2022) discussed the challenges and opportunities of using artificial intelligence in higher education. They pointed out that while AI can assist in learning, students could adopt passive learning, rather than thinking. The authors called for institutions to create policies to encourage responsible use of AI and protect cognitive development.

The dynamics of AI utilisation and its contribution to the development of critical thinking among undergraduates have been studied in recent times in Nigeria. The study by Nwosu *et al.* (2025) also investigated the perceptions of higher education teachers in Anambra State about the effects of AI on the development of critical thinking, revealing a significant debate among the teachers concerning the effects of the use of AI on the development of critical thinking. Likewise, Ogunleye *et al.* (2025) investigated how AI was affecting problem identification and convergent thinking among undergraduate students in Kwara State, Nigeria, and concluded that while AI can be a helpful academic aid, its uncritical application can be a threat to thinking for oneself.

The studies indicate that generative AI has the potential to enhance learning but with significant concerns about the impact on critical thinking skills. Most of the studies, however, have been conducted with students at universities and few studies were done at polytechnics particularly in HND students who are preparing for technical careers. This study aims to fill this gap by targeting the focus on Auchi Polytechnic.

Methodology

This study adopted descriptive survey research design to investigate the relationship between the use of Generative Art Intelligence and critical thinking of HND students of Auchi Polytechnic. This was selected as this is a way of collecting information from students that does not modify or affect behaviour. The study was conducted on the HND I and HND II students in the four schools of the polytechnic namely, School of Engineering Technology, School of Environmental Studies, School of Business Studies, and School of Communication and Information Technology. These levels are selected due to the nature of the work undertaken by the students working at the HND level and the extent of using digital tools for research and assignment work.

About 2,800 students were studied in these schools including HND I and HND II students. The participants were selected using Stratified random sampling technique. Firstly, the four schools were chosen. Then, departments were randomly selected within each

school. Finally, a proportional sampling of students was taken from each department. A sample of 380 respondents was calculated by applying Taro Yamane's formula. To collect data, a structured questionnaire was used titled: 'Generative AI and Critical Thinking Questionnaire (GAICTQ)'. The aim of the questionnaire was to gather data regarding students' experiences with generative AI tools, their understanding of critical thinking skills and their difficulties. The instrument comprised of 30 items in a 4 point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree).

The questionnaire was pretested by experts in the field to assure its validity and clarity. For measuring the consistency of the instrument, reliability test was conducted using Cronbach's Alpha method with the result of the reliability coefficient was 0.86, so the instrument was very reliable. To ensure maximum participation, the questionnaire was given as a hardcopy survey and delivered online. Data collection was for three weeks and participants were reminded regularly. The students were informed that their responses would remain anonymous and confidential and participation was voluntary.

An overall return rate of 96 per cent was achieved, with 365 out of 378 students returning the questionnaires at the end of the data collection process. The answers were systematically organized and coded for analysis. Data were analyzed using SPSS (Statistical Package for the Social Sciences) package. The data for answering the research questions was described by using descriptive statistics like mean and standard deviation. In addition, inferential statistics (Pearson Product Moment Correlation Coefficient (PPMC)) was used for testing the hypotheses formulated at 0.05 level of significance.

Results

Research Question one: How much are HND students of Auchi Polytechnic using generative AI tools in their academic pursuits?

T**able 4.1:** Generative AI Use for Academic Work

S/NO	Items	Mean	SD	Remarks
1	I use generative AI to complete assignments	3.34	0.79	Agreed
2	I use generative AI to get ideas for my projects.	3.41	0.76	Agreed
3	I understand something complicated with the help of generative AI.	3.37	0.77	Agreed
4	I use generative AI for summarising, when dealing with long texts	3.29	0.80	Agreed
5	Use generative AI to write reports or essays	3.24	0.81	Agreed
6	I use generative AI to solve real world problems	3.19	0.83	Agreed
7	I use generative AI to prepare for exams	3.14	0.85	Agreed
Grand	Mean	3.31	0.80	Agreed

Source: Field survey, 2026

As indicated in the results of Table 4.1, the use of generative AI tools for academic work among the HND students of Auchi Polytechnic is quite high. A high proportion of people confirmed using AI to complete task (mean 3.34) to get ideas for projects (mean 3.41), to understand difficult topics (mean 3.37) and to summarise texts (mean 3.29). Students also use AI to write reports (mean = 3.24), solve problems (mean = 3.19) and prepare for exams (mean = 3.14). The overall mean of 3.31 indicates that, overall, students feel they use generative AI regularly for academic purposes.

Research Question Two: How does students' critical thinking skills seem to be affected by their use of generative AI?

Table 4.2: Perceived effect of use of Generative AI on critical thinking skills

S/NO	Items	Mean	SD	Remarks
1	I feel that my ability to think for myself has reduced since I started using AI	3.37	0.78	Agreed
2	I find it difficult to analyze problems without the help of AI	3.41	0.75	Agreed
3	I tend to take AI responses as they are, without questioning them.	3.44	0.73	Agreed
4	I don't feel that I'm getting good at thinking deeply anymore	3.39	0.76	Agreed
5	I find it difficult to evaluate information without AI.	3.34	0.79	Agreed
6	I have trouble putting together my own arguments without using AI	3.37	0.77	Agreed
7	I feel I have become less creative because of AI use	3.31	0.80	Agreed
8	I am concerned about my critical thinking abilities becoming weaker	3.43	0.74	Agreed
Grand	Mean	3.40	0.77	Agreed

Source: Field survey, 2026

Table 4.2 indicates that students feel that their critical thinking abilities have decreased since they began using generative AI to help them. They have seen their thinking autonomy (mean = 3.37) decline, they struggle to solve problems without the aid of AI (mean = 3.41), and they are prone to taking the word of AI without independent verification (mean = 3.44). Students also reported that they are not used to thinking deeply (mean = 3.39); they find it hard to evaluate information without AI (mean = 3.34); and they are concerned about their critical thinking skills becoming weaker (mean = 3.43). The overall score for students' critical thinking skills with generative AI is a grand mean of 3.40, with a significant score indicating a general negative impact on critical thinking skills.

Research Question Three: What are some of the challenges students face in retaining their critical thinking skills with the use of generative AI?

Table 4.3: Challenges in Maintaining Critical Thinking While Using Generative AI

S/NO	Item Statement	Mean	SD	Remarks
1	Do not have to think very much about the AI answers	3.47	0.72	Agreed
2	I have adapted myself to receiving fast responses from an AI.	3.44	0.73	Agreed
3	I don't know how to use AI without losing my thinking power	3.37	0.77	Agreed
4	I do not feel that my lecturers provide clear guidance on the responsible use of AI	3.41	0.75	Agreed
5	I feel like I need to get things done as fast as I can, so using AI is a necessity	3.49	0.71	Agreed
6	I don't know how much of AI use is okay	3.34	0.79	Agreed
7	Verifying information provided by AI is difficult for me	3.39	0.76	Agreed
8	I worry that if I don't use AI, I will fall behind other students	3.31	0.80	Agreed
Grand	Mean	3.41	0.75	Agreed

Source: Field survey, 2026

In Table 4.3, there are multiple challenges students encounter when using generative AI. AI answers are so good that they don't have to think deeply (mean = 3.47), they have come to rely on getting quick answers (mean = 3.44), and they feel pressured to complete assignments quickly (mean = 3.49). Students also answered that they are not sure how they can use AI without losing their own thinking (mean = 3.37), that the lecture does not provide clear guidance (mean = 3.41), and that it is difficult to verify the information provided by AI (mean = 3.39). The overall rate of critical thinking (3.41) indicates that students encounter a lot of difficulties in applying generative AI while maintaining their critical thinking.

Test of Hypotheses

Hypothesis 1: There is no clear relationship between students' reported deterioration in critical thinking and frequency of generative AI use.

Table 4.4: A summary of the Pearson r between GPAI use and perceived decline in critical thinking skills

Variable	Mean	SD	Correlation (r)	p-value	Decision
Generative AI Use	3.31	0.80	0.568**	0.001	Null Hypothesis Rejected
Perceived Critical Thinking Decline	3.40	0.77			

Source: Field survey, 2026

Note: Pearson r coefficient ±0.00 – 0.39 = Weak; ±0.40 – 0.69 = Moderate; ±0.70 – 1.00 = Strong; p < 0.05 = Significant

The correlation coefficient (r = 0.568) from the result in Table 4.4 shows a moderate and positive relationship between the frequency of generative AI use and perceived critical thinking decline. The p value (0.001) is below 0.05 when it is statistically significant. As a result, the null hypothesis will be rejected. In other words, the more frequently students use generative AI, the more they feel it has negatively impacted their critical thinking abilities.

Hypothesis 2: The perceived decline in critical thinking among students is not significantly different when using AI to complete assignments compared to learning support.

Table 4.5: **T-Test Analysis for Perceived Critical Thinking Decline by Type of AI Use**

Variable	Type of Use	Mean	SD	t-cal	df	p-value	Decision
Perceived Critical Thinking Decline	Assignment Completion	3.51	0.72	3.18	363	0.001	Null Hypothesis Rejected
	Learning Support	3.24	0.81				

Source: Field survey, 2026

The analysis of the t test was conducted to compare the perceived critical thinking decline between students who use AI mainly for the completion of assignments (n = 215) and those who use AI for learning support (n = 150), as shown in Table 4.5. So the calculated t value of 3.18 with 363 degrees of freedom gave a p value of 0.001 which is below 0.05. Thus, we reject the null hypothesis. This indicates that there is a significant difference between the two groups. Students using AI to complete assignments report more loss of critical thinking than those using AI as a learning support tool.

Hypothesis 3: No significant correlation between availability of AI use guidance and students' ability to hold onto critical thinking skills.

Table 4.6: Presents the Pearson r value for each of the relationships between the availability of guidance on AI use and the ability to maintain critical thinking.

Variable	N	Mean	SD	Correlation (r)	p-value	Decision
Availability of Guidance	365	2.94	0.86	0.489**	0.001	Null Hypothesis Rejected
Ability to Maintain Critical Thinking	365	3.17	0.81			

Source: Field survey, 2026

Note: Pearson r coefficient ±0.00 – 0.39 = Weak; ±0.40 – 0.69 = Moderate; ±0.70 – 1.00 = Strong; p < 0.05 = Significant

The correlation coefficient (r = 0.489) from the result in Table 4.6 shows a moderate and positive relationship between the availability of guidance on AI use and students' ability to maintain critical thinking skills. The p value (0.001) is less than 0.05 indicating

statistical significance. So, the null hypothesis is rejected. Students who say they have greater guidance for appropriate use of AI also say they have better critical thinking skills.

Discussion of Findings

The results of this study reveal that HND students of Auchi Polytechnic have been using Generative AI tools to a great extent for academic purposes. They can rely on AI to assist you with assignments, brainstorming ideas, comprehending complex subjects, and summarizing text. The finding was in line with Enoghase and Ogbeide (2025) who found that the students who are studying under-graduate level used ChatGPT for similar purposes in Ambrose Alli University. It also reflects the results of international research which found that the use of generative AI (GAI) by students is widespread (Kasneci *et al.*, 2023; UNESCO, 2023). The ubiquity of AI in institutions indicates that generative AI has become mainstream in the lives of students. This result aligns with Deng *et al.* (2024), who reported that ChatGPT has been generously adopted in academic settings like writing support, brainstorming, formative feedback and inquiry based learning.

The study also revealed that students feel their critical thinking ability has decreased since they began using generative AI. They said that they can't work out problems without AI, they take AI answers at face value and that they feel less sharp. This is a significant discovery as it illustrates that students recognize the detrimental impact of AI on their thinking. It aligns with the worry of Adeshola and Adepoju (2023) and Oyelude (2023) regarding the possibility of AI diminishing critical thinking. Likewise, Tlili *et al.* (2023) claimed that AI tools can provide students with 'cognitive offloading', whereby they rely on the devices to think for them, which can have adverse effects on their ability. This finding is also in line with the systematic review by Zhang *et al.* (2025) that found that ChatGPT can develop analytical and evaluative skills when it is integrated effectively, but there was no evidence of its cultivation of critical thinking dispositions (e.g., truth seeking, openness, and systematicity).

Students pointed out certain issues that can hinder critical thinking when utilizing AI. This includes how easy it is to get quick answers, pressure to do things quickly, not receiving proper directions from lecturers, and not being able to check information created by AI. This is in line with Mollick and Mollick (2023) who stated that if not properly scaffolded, students may employ AI without learning. It also reflects the concerns of Dwivedi *et al.* (2023) relating to the need for effective policies and training in educational institutions. Also, there are concerns that students become so dependent on AI for mundane tasks that they develop a lack of critical thinking, which Valcea, Hamdani and Wang (2024) highlighted as a potential danger of AI technology in education. They suggest that students use AI wisely and consider using it as a tool to strengthen their critical thinking skills rather than replace them.

The hypothesis tests produce compelling evidence of the negative correlation between generative AI use and critical thinking. This significant positive correlation between students' use of AI and their perception of critical thinking decrease ($r = 0.568$) indicates that the more students used AI, the more they perceived a decrease in critical thinking. The marked difference in the percentage of students completing assignments using AI and those using it for learning support highlights the importance of the way AI is being employed. Using AI to just do the work is more risky than using AI to aid learning. This is consistent with the results of Kasneci *et al.* (2023) who highlighted the importance of the pedagogical context of using AI. There is a significant relationship between the guidance and the ability to maintain critical thinking ($r = 0.489$), indicating that proper policies and training may be beneficial for students to use AI in ways that support their thinking, as emphasized by UNESCO (2023) and Adarkwah (2021).

The results of this research have significance in the field of education and skill development of the students. However, if students persist in using AI as a means of avoiding critical thinking, they could leave high school with reduced analytical and problem-solving abilities. This would have an impact on their job success and economic contribution. But the results also indicate that students can leverage AI tools to enhance their learning, if they are guided appropriately. It aligns with the concept of using GenAI as a 'bicycle for the mind' as espoused by Manfield, Hawkesby and Nucifora (2025) when used with a clear purpose within the context of tertiary learning and teaching.

The results also align with the cognitive offloading literature. Using ChatGPT to copy and paste the answer or to write a full text without any critical response or analysis is exactly what students do when they are not learning or practicing the skills of critical thinking, as Chen & Chang (2024) and Correia *et al.* (2024) have reported. This can result in shallow knowledge of the content and a decline in the ability to think independently. This study is empirical and addresses these concerns in the Nigerian Polytechnic context.

Conclusion

The relationship was studied between the use of generative AI and critical thinking in the study of HND students of Auchi Polytechnic. The results indicate that students have a high level of engagement with AI in their academic studies and feel that their critical thinking skills have diminished. The more students use AI, the more they report a decrease; students using AI to complete assignments face a higher risk compared to those using AI for learning support. The research also revealed that when students have clear guidelines on the use of AI, they can keep their critical thinking intact.

The research is summarized as generative AI having both potential opportunities and threats to student learning. While AI can assist students in completing tasks more quickly and comprehend complex concepts, excessive reliance can negatively affect their critical thinking abilities, which are necessary for academic achievement and beyond. The question for instructors and schools is how to integrate AI into their teaching to augment, not supplant, thinking. Future teaching should shift from only 'knowing how to critique' to promoting an attitude and duty to engage in critical thinking, as Zhang *et al.* (2025) concluded. It calls for a pedagogical

transformation that integrates AI literacy and critical thinking skills into the educational framework, enabling students to engage with AI-mediated learning environments in a thoughtful and responsible manner.

Findings of this study have led to the following recommendations:

1. Training programmes to equip HND students with the knowledge of responsible use of generative AI should be introduced in Auchi Polytechnic. Students should be able to ask good questions, check and validate information created by an AI and use it as a learning tool instead of a tool to replace thinking.
2. Re-designing tasks so as to promote critical thinking among lecturers. Assignments should not only require a student to produce answers that AI can readily create, they should ask the student to explain his reasoning, compare his sources, and reflect on the learning process.
3. The acceptable usage of AI should be clearly established within the polytechnic. Students should be aware of the appropriate time to utilize AI and when to exert effort by themselves.
4. Pupils should be encouraged to consider the role of AI in their learning and how they use it. This may involve short reflections on when and why they used AI, as well as what they learned. This kind of reflective learning can enable students to foster metacognitive understanding and critical awareness of AI tools.
5. Lecturers require training on implementing AI in their teaching to aid learning. They also require assistance in creating assessment techniques that are not susceptible to misuse by AI, yet can still make use of the devices to assist students. This training should be continuous and involve new research in the field of AI and pedagogy.
6. Long-term research is needed to investigate how the use of generative AI impacts the evolution of students' critical thinking skills over the years, including longitudinal studies that follow students' cognitive growth over time.

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