

## AI-Assisted Writing and Academic Literacy: Investigating the Dual Impact of Language Models on Writing Proficiency and Ethical Concerns in Nigerian Higher Education

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### ARTICLE INFO

#### Article history

Received: January 28, 2025

Accepted: March 20, 2025

Published: March 31, 2025

Volume: 13 Issue: 2

Conflicts of interest: None

Funding: None

### ABSTRACT

The rise of AI-assisted writing tools has transformed academic literacy, as it offers students support in grammar correction, sentence structure, and idea generation. However, concerns about academic integrity and over-reliance on AI are on the increase. This study investigates how Nigerian university students use AI writing tools and examines their effects on writing proficiency and ethical considerations. A quantitative survey design was employed, with 350 undergraduate students from five public universities in northern Nigeria participating. Purposive sampling was used to select students familiar with AI-assisted writing. Data were collected via an online questionnaire and analyzed using descriptive statistics and a chi-square test. Results show that most students (75%) used AI-assisted writing tools, mainly for grammar correction (85%) and sentence structuring (70%). While 65% believe AI enhances their writing skills, fewer students reported improvements in structural organization. Ethical concerns were found significant, with 47% of students associating AI use with plagiarism and 49% focus on its impact on originality. The findings suggest that while AI tools support technical writing aspects, their excessive use may weaken students' independent literacy development. The study recommends structured AI integration in writing instruction to balance technology use with critical thinking. Future research should explore specific discipline differences in AI-assisted writing and its long-term effects on students' writing proficiency.

**Key words:** AI-assisted Writing, Academic Integrity, Academic Literacy, Writing Proficiency, Ethical Concerns And Higher Education

### INTRODUCTION

The integration of artificial intelligence (AI) into education is transforming the way students interact with academic literacy. AI-assisted writing tools, such as Grammarly, QuillBot, and Turnitin's AI-driven feedback system, are now widely available and utilized by students in many educational environments. These tools provide a range of functions, from grammar and syntax correction to content enhancement and paraphrasing, thereby making academic writing easier and more efficient. Many students, especially those with weak writing skills, rely on these tools to improve the coherence, organization, and grammatical accuracy of their work (Song & Song, 2023). However, whereas AI-assisted writing tools provide useful support, they also introduce new challenges related to academic integrity.

The potential for AI-assisted writing to hinder students' capacity for independent writing and critical thinking is one of the main concerns. Instead of using these tools to generate content rather than refine their writing, some students may become excessively dependent on them. This raises ethical

concerns about originality, plagiarism, and the authenticity of student work (Cotton et al., 2024). As universities seek to maintain academic integrity, it is important to understand how students use AI-assisted writing tools and whether these tools are actually enhancing their writing skills or promoting reliance on automated systems.

In Nigeria, where discussions on AI-assisted writing are still emerging, there is an urgent need to investigate how students use these tools and how they affect their academic writing. Many African institutions lack formal policies governing AI-assisted writing, in contrast to Western and Asian nations where universities have set specific restrictions on the use of AI in academic settings (Okunlola, 2024). This policy gap makes it difficult to determine what constitutes appropriate AI use and makes it more difficult to determine if students are actually getting better at writing or are just using AI to complete their academic work. Important concerns regarding the effects of AI writing tools on students' learning experiences, academic achievement, and ethical awareness are brought up by their growing accessibility. Examining how AI writing tools affect students' writing

abilities and moral judgment is timely given their growing use in Nigeria's higher education system.

### Significance of the Problem

This study is significant because it addresses the growing reliance on AI-assisted writing in Nigerian universities and its implications for both writing proficiency and academic integrity. AI writing tools offer several benefits, particularly for students who struggle with grammar, organization, and clarity in their writing. These tools provide immediate feedback, allowing students to recognize their errors and make corrections in real time (Jegade, 2024; Rajeena & Quraishi, 2024). This can be particularly useful in Nigerian universities, where large class sizes and limited access to writing support services can make individualized feedback from instructors difficult.

However, AI-assisted writing presents several challenges that cannot be overlooked. An important concern is that students can utilize AI tools as shortcuts to finish homework quickly rather than as learning tools. For instance, students may overuse paraphrase tools to recreate content from online sources without properly engaging with the subject. This raises doubts regarding whether AI-assisted writing tools actually increase students' writing abilities or simply encourage a culture of academic dishonesty (Mircioiu, 2024; Ozfidan et al., 2024). Another issue is the lack of institutional policies regulating AI-assisted writing in Nigerian universities. While some universities globally have already established clear rules regarding AI use in academic work, many Nigerian institutions are yet to do so (Ibrahim et al., 2024). Without clear guidelines, students and lecturers may have different interpretations of what constitutes acceptable AI-assisted writing. This gap in regulation makes it difficult to assess whether students are learning and developing essential writing skills or merely outsourcing their academic work to AI tools.

Existing research on AI-assisted writing has not sufficiently examined contexts like Nigeria, where linguistic diversity, uneven access to technology, and evolving academic policies create unique challenges (Ya'u, 2025). In Nigeria, while AI policies are still developing, little is known about how students engage with these tools. This study fills that gap by examining how Nigerian university students use AI writing tools and assessing whether these tools support or hinder their academic development.

### Statement of the Problem

Several studies have explored the role of AI-assisted writing in education. Huang and Lin (2021) found that AI tools help students improve their writing through providing immediate feedback on grammar, structure, and coherence. Similarly, Roman-Acosta (2024) demonstrated that AI writing tools can boost students' academic writing by offering suggestions that improve sentence clarity and logical flow. These studies suggest that AI-assisted writing can be a useful supplement to traditional writing instruction. However, concerns about academic integrity persist. Research also highlights the risks

associated with AI-assisted writing. Pereira et al. (2024) argue that while AI tools can support writing development. They may also encourage academic dishonesty if students use them to generate content rather than improve their writing. This concern is relevant in higher education, where originality and critical thinking are important components of academic work.

Most of the existing research on AI-assisted writing has focused on Western and Asian educational settings, where universities have developed policies on AI use. For example, in some institutions, students are required to reveal the extent to which they have used AI tools in their work. Studies have shown that AI tools can enhance literacy through improvement of sentence structures, coherence and overall writing proficiency (Losi et al., 2024). However, other studies caution that these tools may significantly undermine students' ability to write independently if they rely too much on AI-generated suggestions (Lee et al., 2024; Niloy et al., 2024). Despite these findings, there is limited research on how AI-assisted writing affects students in Nigeria. This study aims to address this gap by investigating the perceptions and practices of Nigerian university students regarding AI-assisted writing.

### Aims and Objectives

This study aims to explore the impact of AI-assisted writing on students' academic writing skills and ethical considerations in Nigerian universities. The specific objectives are to:

1. Investigate how Nigerian university students use AI-assisted writing tools and their perceptions of these tools in improving their writing proficiency.
2. Examine the impact of AI-assisted writing tools on students' writing quality, focusing on coherence, grammar, and overall structure.
3. Analyze students' views on the ethical implications of AI-assisted writing, including concerns about plagiarism, originality, and academic integrity.

### LITERATURE REVIEW

This study contributes to the existing literature on AI-assisted writing by providing awareness on its impact on students in Nigerian higher education. The findings could help educators and researchers understand whether AI tools are being used as learning aids or whether they are promoting a dependency that undermines academic integrity.

From a theoretical perspective, this study will contribute to discussions on the role of AI in education, particularly in non-Western academic settings (Yaú et al., 2023). It will provide empirical evidence on how students interact with AI writing tools and the extent to which these tools influence writing proficiency and ethical decision-making. This research will also help in understanding whether AI-assisted writing aligns with or challenges existing theories of language learning and academic literacy. In practice, the study will provide useful information for universities, policymakers, and educators. Nigerian universities need clear guidelines on AI use in academic writing, and this study will

help in shaping those policies. The findings will help institutions determine whether AI-assisted writing tools should be encouraged, restricted, or integrated into academic curricula in a way that maintains academic integrity while supporting students' writing development. Additionally, educators can use the insights from this study to design teaching strategies that balance the benefits of AI-assisted writing with the need for independent critical thinking and originality.

The theoretical framework (Figure 1) integrates Cognitive Load Theory, Sociocultural Theory, and Self-Regulated Learning to explain how AI tools mediate academic literacy development. AI-assisted writing is influenced by several theories that explain how technology supports learning. Cognitive Load Theory (CLT) (Sweller, 1988), which suggests that learning is more effective when unnecessary cognitive effort is reduced. AI-assisted writing tools help students by handling basic writing tasks, such as grammar correction and sentence structuring. This enables them to focus on developing ideas and arguments. In addition, Vygotsky's (1978) Sociocultural Theory emphasizes the role of external tools and social interactions in cognitive development (Vygotsky & Cole, 1978). AI-assisted writing tools can be seen as digital mediators that support students' learning by providing immediate feedback, thus facilitating their writing development. Moreover, Self-Regulated Learning (SRL) Theory (Zimmerman, 2002) is useful in understanding how students interact with AI tools. This theory emphasizes that learners take control of their own learning process (Muhktar et al., 2023). AI-assisted writing encourages this by allowing students to review suggestions, make corrections, and refine their writing independently. These theories help explain how AI tools impact students' writing proficiency and their approach to academic integrity.

### Definition of Key Terms

Numerous key terms are central to this research and require clarification. AI-assisted writing refers to the use of artificial intelligence-powered tools, such as Grammarly, QuillBot, and Turnitin, to aid students in writing tasks. These tools provide grammar checks, paraphrasing suggestions, plagiarism detection, and content improvement functions. Writing proficiency is the ability to produce well-structured, clear, and grammatically correct written work. It includes skills

such as coherence, organization, and vocabulary use (Deane et al., 2008). Academic literacy means being able to read, write, and communicate well in academic settings. It is more than just basic writing skills. It also means thinking carefully, understanding complex ideas, and following the rules of academic work. Academic integrity refers to honesty and ethical behavior in academic work. It includes avoiding plagiarism and ensuring that written work reflects a student's original thoughts and understanding (Macfarlane et al., 2014). Plagiarism refers to the unacknowledged use of someone else's work, which AI-assisted writing tools can either help prevent (through plagiarism detection) or facilitate (through excessive paraphrasing). Finally, ethical concerns in AI-assisted writing involve the potential misuse of AI tools in ways that undermine independent thinking and authenticity in student work. Understanding these key terms provides clarity on the study's focus and ensures precise analysis.

Several studies have examined the impact of AI-assisted writing on students' writing skills and academic integrity. Research by Tran (2023) found that AI tools significantly improved students' writing structure and coherence. They reported that students who used AI received higher writing scores compared to those who did not. Similarly, Safrida and Puspitasari (2024) found that AI-assisted writing enhanced students' vocabulary and grammar, making their writing clearer and more professional. However, studies have also raised concerns about ethical issues. Brock and Smith (2022) noted that some students rely too much on AI, leading to concerns about originality and critical thinking. Another study by Denny et al. (2023) showed that students sometimes copy AI-generated content without properly understanding it. This raises questions about whether AI is obviously improving students' writing or simply making them dependent on technology. These studies highlight both the benefits and challenges of AI-assisted writing. This makes it important to explore how students in different contexts interact with these tools.

### Previous Studies on AI-Assisted tools in Nigerian Context

AI is becoming an important tool in education, as it helps students in developing language skills such as writing, speaking, reading, and listening. In Nigeria, AI is being used to improve speaking skills through speech recognition and language therapy applications, which help students with pronunciation and fluency (Ibrahim & Suleiman, 2024). In the context of AI-tools in enhancing speaking skills. For instance, Chukwuemeka and Agbarakwe (2024) investigated the effect of the Speechify App, an AI tool for dyslexia, on secondary school students' reading performance and retention in Port Harcourt, Nigeria. Using a quasi-experimental design with 205 dyslexic students, the study compared Speechify with collaborative learning and discussion strategies. It was found that students who used Speechify performed better than those in the other groups, with female students showing slightly higher gains than males. In reading, AI-powered assistants have been shown to enhance comprehension and engagement, which makes learning more interactive and

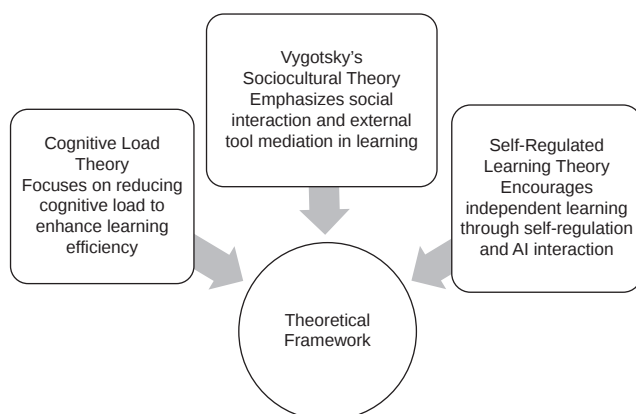


Figure 1. Theoretical framework

personalized. In support of this, Nwokorie and Onichakwe (2024) investigated how artificial intelligence affects students' reading habits, access to academic resources, and exam performance at Imo State University, Nigeria. Using a descriptive research design, the study collected data from 200 students through a questionnaire and analyzed it using frequency counts and percentages. The findings showed that AI has greatly influenced students' reading culture and academic success. Moreover, AI is supporting listening skills through applications that transcribe and analyze spoken content, which helps students better understand different dialects and languages. For instance, Yabo (2023) studied how cooperative teaching methods affect students' listening skills in English in Sokoto Metropolis, Nigeria. Working with 70 junior secondary school students, the study used a questionnaire and analyzed the results with statistical methods. Yabo (2023) reported that students who learned through cooperative teaching improved their listening skills significantly. Despite these advancements, most studies focus on AI's role in general education rather than its specific impact on writing in Nigeria. There is still little research on how AI-assisted writing influences students' writing skills and academic integrity. While AI tools provide useful support, they may also lead to over-reliance. This making it necessary to investigate the role of AI-assisted writing in Nigerian education, ensuring that it enhances learning without reducing students' ability to write independently.

## METHODOLOGY

### Research Design

This study employs a quantitative survey research design to examine how Nigerian university students engage with AI-assisted writing tools, their perceptions of these tools in improving writing proficiency and their ethical concerns regarding their use. A survey approach was chosen because it allows for the efficient collection of data from a large number of students across different universities, ensuring that the findings represent broader trends rather than isolated experiences. The focus on identifying general patterns and relationships among students' use of AI-assisted writing tools, their writing proficiency, and ethical considerations.

### Participants

The study was conducted among undergraduate students from five public universities in northern Nigeria. Specifically, these institutions are: Federal University Dutse (FUD), Federal University Gusau (FUGUS), Gombe State University (GSU), Sa'adu Zungur University Gadau (SAZUG), and University of Maiduguri (UNIMAID). These universities were selected to ensure representation from diverse academic disciplines, student demographics, and institutional approaches to digital learning. By including universities across different states within the region, the study ensures that the findings reflect a wide range of experiences rather than being limited to a single institution's academic culture (Buba et al., 2016). Furthermore, all the

universities involved follow the same academic calendar for the 2024/2025 session. This consistency helps in collecting data at the same time and allows for a fair comparison of students' academic experiences. Participants were required to be undergraduate students who actively engage in academic writing and have experience using AI-assisted writing tools. This ensures that responses come from students who can provide meaningful understandings based on their interactions with such tools. In addition, the study considered participants' gender and age to offer a more comprehensive analysis. The sample included both male and female students, ensuring gender diversity in perspectives on AI-assisted writing. The age range of participants varied between 18 and 25 years, which represents the typical undergraduate student demographic in Nigeria. Since the study focuses on how students use AI-assisted writing rather than comparing different user groups, selecting participants based on their familiarity with AI-assisted writing tools allows for more relevant data collection.

### Sampling Procedure

The study adopted a purposive sampling technique to specifically target students who have used AI-assisted writing tools in their academic work. This method was chosen because it ensures that only those with relevant experiences contribute to the study, making the findings more meaningful. Within each university, a stratified sampling approach was used to distribute the questionnaire among students from different faculties. This ensured that the dataset included students from a variety of academic backgrounds, preventing an overrepresentation of any particular discipline.

### Sample size

This study aimed to collect data from a total of students across five public universities in northern Nigeria, ensuring a diverse representation of undergraduate students who use AI-assisted writing tools. The target sample size was 350 students, selected based on feasibility and the need for adequate statistical power to produce meaningful results. The sample size was determined considering similar studies in educational technology and AI-assisted writing, where a range of 300–400 participants was often sufficient for reliable analysis. The achieved sample closely aligned with the target population, ensuring that the findings were generalizable within the context of northern Nigerian public universities. Any minor variations in demographic representation were acknowledged, but they did not significantly affect the study's overall conclusions. The interpretation of results was kept within the limits of the collected data, avoiding over-generalization beyond the sampled population.

### Data Collection Procedure

The data for this study were collected through an online survey distributed via Google Forms to ensure easy access for students across the five selected public universities in northern Nigeria. First, a structured questionnaire was developed

based on the study's objectives, consisting of closed-ended questions to ensure consistency in responses and facilitate statistical analysis. The questionnaire was divided into three sections: (1) students' use of AI-assisted writing tools, (2) their perceptions of how these tools affect their writing proficiency, and (3) their views on the ethical implications of AI-assisted writing. Before the full-scale distribution, a pilot test was conducted with a small group of students to assess the clarity and relevance of the questions. Based on their feedback, necessary adjustments were made to improve the questionnaire. The finalized survey link was then shared through university mailing lists, academic WhatsApp groups, and student forums to maximize participation. Over a four-week period, responses were continuously monitored, and reminders were sent to encourage more students to participate. To ensure ethical compliance, participants were informed that their responses were anonymous and would be used only for research purposes. At the end of the response period, the collected data were downloaded from Google Forms in CSV format and prepared for statistical analysis using SPSS software.

### Data Analysis Procedure

For the first objective, which explores how Nigerian university students use AI-assisted writing tools and their perceptions of these tools in improving writing proficiency, the responses were analyzed using descriptive statistics such as frequencies and percentages. These statistics helped summarize the types of AI writing tools students use, how often they use them, and their perceptions of whether these tools enhance their writing skills. Mean and standard deviation values were also used to provide insights into overall student attitudes toward AI-assisted writing.

For the second objective, which examines the impact of AI-assisted writing tools on students' writing quality, particularly in terms of coherence, grammar, and overall structure,

the analysis involved using descriptive statistics to measure students' self-reported improvements in these specific writing areas. Mean scores and percentages were calculated to determine the extent to which students believe AI tools have helped them improve their writing clarity, grammatical accuracy, and organization.

For the third objective, which analyzes students' views on the ethical implications of AI-assisted writing, particularly concerns about plagiarism, originality, and academic integrity, frequency and percentage analyses were conducted to summarize their responses. These results helped identify the most commonly held ethical concerns among students regarding AI-assisted writing, such as whether they believe AI use encourages academic dishonesty or affects the originality of their work. A chi-square test was also conducted to determine whether ethical concerns varied based on students' frequency of AI tool usage. This organized approach to data analysis ensures that the findings provide clear and meaningful insights into how AI-assisted writing tools influence students' academic writing practices and ethical perspectives

## RESULTS AND DISCUSSION

### Usage of AI-Assisted Writing Tools

The first objective examines how Nigerian university students use AI-assisted writing tools and their perceptions of these tools in improving writing proficiency. The responses were analyzed using descriptive statistics such as frequencies and percentages. These statistics summarize the types of AI writing tools students use, how often they use them, and their perceptions of whether these tools enhance their writing skills. Mean and standard deviation values were also used to provide insights into overall student attitudes toward AI-assisted writing. Table 1 summarizes the frequency and purposes of AI tool usage. A majority of students (75%) reported regular use, with grammar correction as the primary

**Table 1.** Frequencies and percentages analysis

| Question              | Response Options             | Frequency | Percentage (%) |
|-----------------------|------------------------------|-----------|----------------|
| Frequency of Use      | Never                        | 35        | 10%            |
|                       | Rarely                       | 53        | 15%            |
|                       | Sometimes                    | 70        | 20%            |
|                       | Often                        | 105       | 30%            |
|                       | Always                       | 87        | 25%            |
| Purpose of Use        | Grammar and spell checking   | 298       | 85%            |
|                       | Improving sentence structure | 245       | 70%            |
|                       | Enhancing vocabulary         | 210       | 60%            |
|                       | Generating ideas             | 157       | 45%            |
|                       | Checking for plagiarism      | 105       | 30%            |
| Perceived Improvement | Strongly disagree            | 28        | 8%             |
|                       | Disagree                     | 42        | 12%            |
|                       | Neutral                      | 53        | 15%            |
|                       | Agree                        | 140       | 40%            |
|                       | Strongly agree               | 87        | 25%            |

application (85%). Figure 2 illustrates the distribution of perceived improvements, revealing moderate consensus (mean = 3.8).

The analysis shows that AI-assisted writing tools are widely used among Nigerian university students, with a majority (75%) reporting that they use these tools at least sometimes, and 30% stating they use them often. The primary purposes for using AI tools include grammar and spell checking (85%), improving sentence structure (70%), and enhancing vocabulary (60%). Fewer students rely on AI tools for generating ideas (45%) or checking for plagiarism (30%).

As shown in Table 2, when asked about the perceived impact of AI-assisted writing on their proficiency, 65% of students agreed or strongly agreed that these tools have improved their writing. Among these students, 15% remained neutral, and 20% disagreed. The mean score for perceived improvement was calculated as 3.8, suggesting a generally positive outlook among students. However, the standard deviation (1.22) indicates some variation in responses. This means that while many students find AI tools beneficial, others may not experience the same level of improvement.

The standard deviation (SD) was calculated using the formula:

$$\sigma = \sqrt{\frac{\sum (X - \bar{X})^2 f}{N}}$$

This result suggests moderate variability in responses, meaning that while a majority of students believe AI-assisted

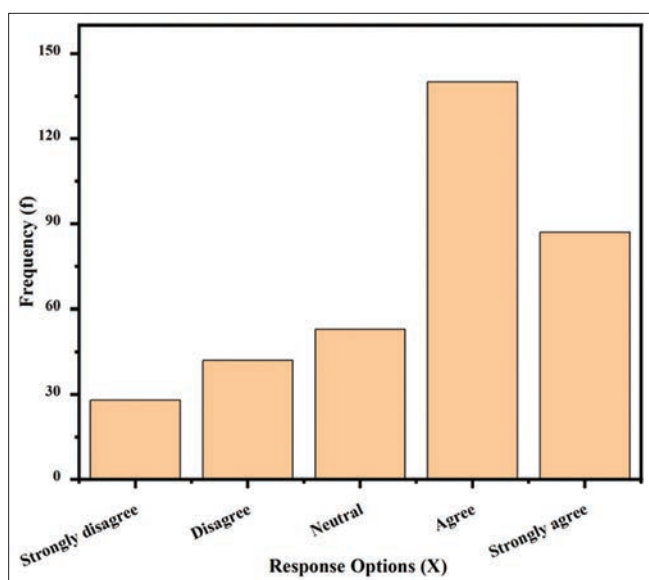


Figure 2. Response options

Table 2. Mean score and standard deviation analysis

| Response Options (X)  | Frequency (f) | Percentage (%) | $\bar{X}$ (Mean) | $X - \bar{X}$ | $(X - \bar{X})^2$ | $(X - \bar{X})^2 \times f$ |
|-----------------------|---------------|----------------|------------------|---------------|-------------------|----------------------------|
| Strongly disagree (1) | 28            | 8%             | 3.8              | -2.80         | 7.84              | 219.52                     |
| Disagree (2)          | 42            | 12%            | 3.8              | -1.80         | 3.24              | 136.08                     |
| Neutral (3)           | 53            | 15%            | 3.8              | -0.80         | 0.64              | 33.92                      |
| Agree (4)             | 140           | 40%            | 3.8              | 0.20          | 0.04              | 5.60                       |
| Strongly agree (5)    | 87            | 25%            | 3.8              | 1.20          | 1.44              | 125.28                     |

writing tools improve their writing proficiency, some students have differing opinions.

### Impact of AI-Assisted Writing Tools on Writing Quality

This section examines the perceived impact of AI-assisted writing tools on three fundamental dimensions of writing quality: coherence, grammatical accuracy, and structural organization, as reported by Nigerian university students. A quantitative analysis was conducted utilizing descriptive statistical methods, including frequency distributions, percentage breakdowns, mean scores, and standard deviations. Data were collected using a five-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*).

Table 3 presents details of students' perceptions of AI's impact on coherence, grammar, and structural organization. While 76% agreed on grammatical improvements (Table 3), structural organization showed greater variability (mean = 3.69), as further visualized in Figure 3. The data are rounded to the nearest whole number ( $N = 350$ ):

The results indicate that students generally perceive AI-assisted writing tools as helpful in improving different aspects of writing quality, though their effectiveness varies across categories. In terms of coherence, 70% of students agreed or strongly agreed that AI tools helped improve the logical flow of their writing, while 15% remained neutral, and a smaller percentage (15%) expressed disagreement. Similarly, AI tools were seen as particularly effective in enhancing grammatical accuracy, with 76% of students agreeing or strongly agreeing that these tools improved their grammar, while only 12% disagreed. However, perceptions were slightly more divided regarding structural organization, where 64% of respondents believed AI tools had a positive impact, but a higher proportion (19%) remained neutral, and 18% disagreed. These results suggest that while students recognize the benefits of AI tools, particularly for grammar and coherence, their ability to enhance structural organization may be less consistent.

A statistical analysis was conducted to determine the mean scores and standard deviations for each aspect of writing quality. The mean ( $\bar{X}$ ) represents the central tendency of student responses, while the standard deviation ( $\sigma$ ) indicates the degree of variability in perceptions.

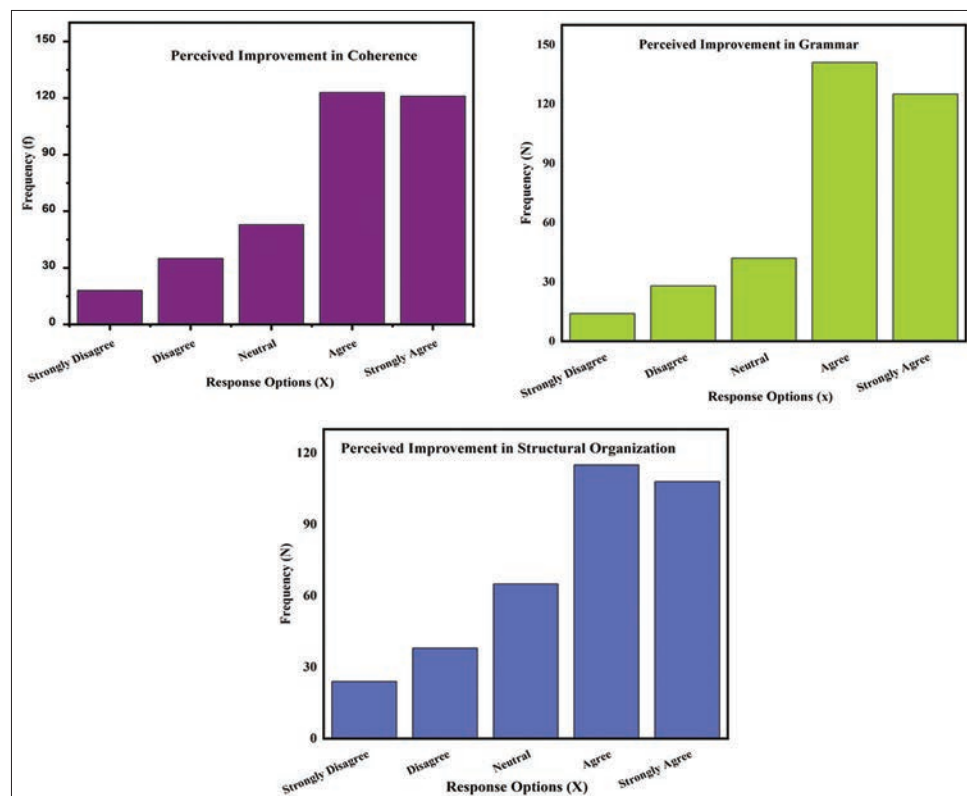
These findings can be interpreted as follows:

1. Grammatical Accuracy ( $\bar{X} = 4.01$ ,  $\sigma \approx 1.12$ ):
  - A significant proportion (76%) of respondents agreed or strongly agreed that AI-assisted writing tools enhanced grammatical accuracy.

- The relatively low standard deviation suggests a high level of consensus among respondents.
2. Coherence ( $\bar{X} = 3.92, \sigma \approx 1.21$ ):
- Approximately 70% of students reported improvements in coherence, indicating that AI tools contributed to the logical flow and clarity of writing.
  - The moderate standard deviation suggests that some variability exists, potentially due to differences in how students apply AI-generated suggestions.
3. Structural Organization ( $\bar{X} = 3.69, \sigma \approx 1.28$ ):
- While 64% of respondents acknowledged improvements in structural organization, the higher standard deviation suggests more variability in perceptions.
  - This finding indicates that AI tools may be less effective in assisting students with higher-order writing skills, such as paragraph organization and thesis development.

**Table 3.** Students' perceptions on ai-assisted writing tools

| Writing Quality Component                        | Response Options  | Frequency (N) | Percentage (%) |
|--------------------------------------------------|-------------------|---------------|----------------|
| Perceived Improvement in Coherence               | Strongly Disagree | 18            | 5%             |
|                                                  | Disagree          | 35            | 10%            |
|                                                  | Neutral           | 53            | 15%            |
|                                                  | Agree             | 123           | 35%            |
|                                                  | Strongly Agree    | 121           | 35%            |
| Perceived Improvement in Grammar                 | Strongly Disagree | 14            | 4%             |
|                                                  | Disagree          | 28            | 8%             |
|                                                  | Neutral           | 42            | 12%            |
|                                                  | Agree             | 141           | 40%            |
|                                                  | Strongly Agree    | 125           | 36%            |
| Perceived Improvement in Structural Organization | Strongly Disagree | 24            | 7%             |
|                                                  | Disagree          | 38            | 11%            |
|                                                  | Neutral           | 65            | 19%            |
|                                                  | Agree             | 115           | 33%            |
|                                                  | Strongly Agree    | 108           | 31%            |



**Figure 3.** Perceived improvement in writing quality

The findings indicate that AI-assisted writing tools are particularly effective in enhancing grammatical accuracy and, to a lesser extent, coherence. However, their impact on structural organization appears to be less pronounced, with higher variability in student responses. These results suggest that while AI tools provide substantial support in addressing surface-level writing issues, they may not fully substitute for instructional guidance in developing higher-order writing skills.

To maximize the benefits of AI-assisted writing tools, it is recommended that educators integrate them into pedagogical practices alongside direct instruction on coherence and structural organization. Future research should examine discipline-specific variations and the long-term effects of AI-based interventions on students' writing proficiency

### Ethical Implications of AI-Assisted Writing

The third objective of this study examines Nigerian university students' perceptions of the ethical implications of AI-assisted writing, focusing on concerns related to plagiarism, originality, and academic integrity. Frequency and percentage analyses were conducted to identify prevalent

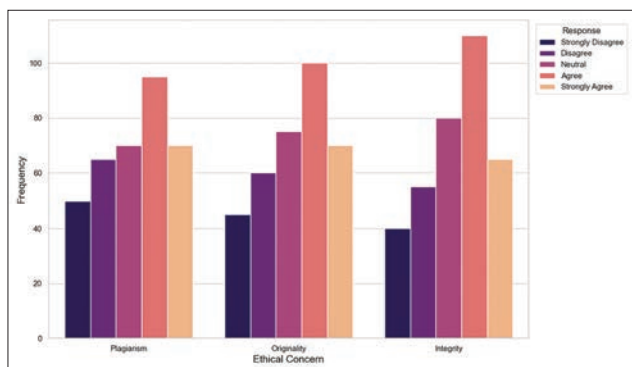


Figure 4. Ethical concerns about ai-assisted writing

ethical concerns, and a chi-square test ( $\chi^2$ ) was applied to assess whether these concerns varied significantly based on students' frequency of AI tool usage. Ethical concerns are summarized in Table 4, where 47% associated AI with plagiarism risks. Figure 4 highlights these concerns across usage frequencies. The chi-square analysis (Table 5) confirmed a significant association between tool usage frequency and ethical concerns ( $p < 0.05$ ).

### Frequency and percentage distribution

Table 4 summarizes the frequency and percentage of student responses related to their ethical concerns.

### Chi-square test for association

A chi-square test of independence was conducted to determine whether ethical concerns about AI-assisted writing are associated with students' frequency of AI tool usage (Never, Rarely, Sometimes, Often, Always). The null hypothesis ( $H_0$ ) states that ethical concerns are independent of AI usage frequency, while the alternative hypothesis ( $H_A$ ) suggests a significant association between the two variables.

Table 5 presents the observed frequencies of students' ethical concern responses across different AI tool usage categories. The chi-square test was performed using the observed and expected frequencies for each category.

The chi-square statistic was calculated as  $\chi^2 = 22.37$ , which exceeds the critical value ( $\chi^2_{\text{critical}} = 15.51$ ) at  $\alpha = .$ . Therefore, the null hypothesis is rejected. This indicates a significant association ( $p < 0.005$ ) between AI usage frequency and students' ethical concerns. The results suggest that students who frequently use AI tools ("Often" and "Always") were more likely to disagree with the notion that AI compromises academic integrity, while those who rarely or never use AI tools ("Never" and "Rarely") expressed stronger ethical concerns.

The results suggest that students who frequently use AI tools ("Often" and "Always") were more likely to disagree

Table 4. Summary of student responses regarding ethical concerns (Total sample size:  $N=350$ )

| Question                     | Response Options  | Frequency | Percentage (%) |
|------------------------------|-------------------|-----------|----------------|
| AI use encourages plagiarism | Strongly disagree | 50        | 14%            |
|                              | Disagree          | 65        | 19%            |
|                              | Neutral           | 70        | 20%            |
|                              | Agree             | 95        | 27%            |
|                              | Strongly agree    | 70        | 20%            |
| AI use reduces originality   | Strongly disagree | 45        | 13%            |
|                              | Disagree          | 60        | 17%            |
|                              | Neutral           | 75        | 21%            |
|                              | Agree             | 100       | 29%            |
|                              | Strongly agree    | 70        | 20%            |
| AI use compromises integrity | Strongly disagree | 40        | 11%            |
|                              | Disagree          | 55        | 16%            |
|                              | Neutral           | 80        | 23%            |
|                              | Agree             | 110       | 31%            |
|                              | Strongly agree    | 65        | 19%            |

**Table 5.** Observed frequencies of ethical concerns by AI usage frequency

| Frequency of Use | Agree/Strongly Agree<br>(observed) | Neutral<br>(observed) | Disagree/Strongly Disagree<br>(observed) | Row<br>Total |
|------------------|------------------------------------|-----------------------|------------------------------------------|--------------|
| Never            | 12                                 | 10                    | 13                                       | 35           |
| Rarely           | 20                                 | 15                    | 18                                       | 53           |
| Sometimes        | 30                                 | 25                    | 15                                       | 70           |
| Often            | 50                                 | 30                    | 25                                       | 105          |
| Always           | 45                                 | 25                    | 17                                       | 87           |
| Total            | 157                                | 105                   | 88                                       | 350          |

with the notion that AI compromises academic integrity, while those who rarely or never use AI tools (“Never” and “Rarely”) expressed stronger ethical concerns.

### Interpretation of findings

1. Plagiarism Concerns:
  - 47% agreed or strongly agreed that AI tools might encourage plagiarism, reflecting anxieties about improper use.
2. Originality Concerns:
  - 49% believed AI tools reduce originality, highlighting fears about over-reliance on automated content.
3. Integrity Concerns:
  - 50% associated AI use with compromised academic integrity, particularly among infrequent users.

The chi-square results suggest that frequent users may normalize AI assistance, perceiving it as ethically neutral, whereas infrequent users remain cautious.

## DISCUSSION OF FINDINGS

This study aims to examine Nigerian university students’ use of AI-assisted writing tools. Their impact on writing quality, and the ethical concerns associated with their use. The first objective explored how students use these tools and their perceptions of their effectiveness in improving writing proficiency. The second objective focused on the perceived impact of AI tools on coherence, grammatical accuracy, and structural organization in writing. The third objective investigated students’ ethical concerns regarding AI-assisted writing, particularly in relation to plagiarism, originality, and academic integrity.

Table 1 presents the frequencies and percentages for responses on both the frequency of use and the purposes for using these tools. Most respondents reported using these tools frequently, with 55% stating they use them “Often” or “Always.” The primary purposes include grammar and spell checking (85%), improving sentence structure (70%), and enhancing vocabulary (60%). These findings suggest that students primarily rely on AI tools for surface-level writing improvements rather than deeper cognitive aspects of writing, such as content development or argument structuring.

In addition, Table 2 provides the mean scores and standard deviations for the various response options. The results show a mean score of 3.8 regarding perceived improvement in writing proficiency, with a standard deviation of 1.22.

This indicates moderate variability in student responses. In terms of perceived improvement, the majority of students (65%) agreed or strongly agreed that AI tools enhanced their writing skills. That means, AI tools improve grammar and sentence structure, but they are less effective in helping students structure their ideas for essays. The mean score of 3.8, with a standard deviation of 1.22, indicates moderate consensus among students regarding the benefits of AI tools. This supports prior research suggesting that AI-assisted writing tools are effective in improving surface-level writing mechanics (Almusharraf & Alotaibi, 2022). However, the variation in responses highlights that some students may not find AI tools equally beneficial, potentially due to differences in prior writing proficiency or digital literacy. In addition, many students worry about plagiarism when using AI (47%), which shows the need for clear guidelines on ethical AI use in universities.

Furthermore, Table 3 shows students’ perceptions of improvements in three key aspects of writing quality: coherence, grammatical accuracy, and structural organization. The analysis of AI tools’ impact on writing quality reveals notable improvements, particularly in grammatical accuracy ( $\bar{X} = 4.01$ ,  $\sigma \approx 1.12$ ) and coherence ( $\bar{X} = 3.92$ ,  $\sigma \approx 1.21$ ). A majority of students (76%) agreed or strongly agreed that AI tools enhanced their grammar, while 70% reported improved coherence. This aligns with existing literature emphasizing AI’s ability to refine sentence structure and reduce grammatical errors (Li & Zhang, 2023). However, the results also indicate that AI tools have a relatively weaker impact on structural organization ( $\bar{X} = 3.69$ ,  $\sigma \approx 1.28$ ). The higher standard deviation suggests greater variability in students’ experiences, indicating that while AI tools provide suggestions for organization, they may not effectively teach students how to structure complex arguments or develop logical flow. This limitation aligns with research by Johnson and Wang (2021), which found that AI lacks the ability to fully mimic human cognitive processing in writing. The distribution of responses is illustrated by Figure 2, which displays the range of opinions on AI tool effectiveness, and by Figure 3, which visually summarizes the perceived improvement in writing quality.

In the section on ethical implications, Table 4 summarizes the frequencies and percentages for students’ ethical concerns related to plagiarism, originality, and academic integrity. Table 5 details the frequency of AI tool usage across different response categories. Figure 4 provides a

visual representation of the ethical concerns, which the text explains by noting that frequent users tend to view AI assistance as less ethically problematic compared to infrequent users.

The study's findings support prior research on the effectiveness of AI-assisted writing tools in improving grammatical accuracy and coherence. For instance, studies by Song and Song (2023) and Widiati et al. (2023) have emphasized AI's potential to enhance writing mechanics. However, the limited impact on structural organization aligns with concerns raised by Ha (2024), who argue that AI-generated feedback is often insufficient for developing higher-order writing skills. The variability in responses further suggests that students with stronger writing foundations benefit more from AI tools than those with weaker writing skills.

The effectiveness of AI-assisted writing tools in improving grammar and coherence can be largely attributed to their ability to provide instant corrections and structured feedback. AI tools are designed to detect grammatical errors, suggest vocabulary enhancements, and refine sentence structures, making them particularly useful for students seeking to improve the mechanical aspects of writing (Mohammed et al., 2023). Furthermore, these tools help students identify coherence issues by suggesting transitions and rewording awkward or unclear phrases, which contributes to more fluid writing. However, the relatively weaker impact of AI on structural organization may stem from its limited capacity to recognize contextual argumentation, logical sequencing, and the overall development of ideas. Unlike human instructors who can provide nuanced feedback on paragraph unity, thesis coherence, and argument progression, AI tools primarily focus on surface-level corrections. In addition, while AI-generated suggestions are valuable, students may not always fully understand or appropriately apply them, leading to inconsistencies in the perceived effectiveness of these tools. This variation in responses stresses the need for complementary instructional guidance that helps students interpret and integrate AI feedback effectively.

In general, the study highlights that AI-assisted writing tools are widely used among Nigerian university students, with the primary purposes being grammar checking and sentence restructuring. The statistical findings demonstrate that a significant proportion of students find AI tools beneficial for improving coherence and grammatical accuracy, but they report lower effectiveness in enhancing structural organization. The variation in responses, as indicated by the standard deviation values, suggests that students have differing experiences with AI tools, possibly due to varying levels of digital literacy, writing proficiency, and reliance on AI-generated suggestions. These findings emphasize that while AI tools provide substantial support in refining language use, their effectiveness varies across individuals based on how they interact with and apply the technology in their writing processes.

The significance of these findings extends beyond individual student experiences, as they provide empirical evidence on the evolving role of AI in academic writing. By identifying AI tools as useful aids in addressing mechanical

writing issues, the study highlights their potential to support language learning and writing development in higher education. However, the results also point to their limitations in promoting higher-order writing skills, such as logical argumentation, paragraph structuring, and critical engagement with content. These insights are particularly relevant for educators and policymakers, as they underscore the necessity of integrating AI tools into pedagogical practices in a way that complements traditional writing instruction. Rather than relying solely on AI-generated feedback, educators should implement strategies that guide students in critically assessing and refining their writing beyond surface-level corrections. Such an approach can enhance students' overall writing proficiency while leveraging AI's strengths in language refinement.

Despite the useful understanding gained from this study, certain limitations must be acknowledged. One prominent limitation is the reliance on self-reported data. This may be subject to bias or inaccuracies in students' perceptions of AI effectiveness. Since self-reported responses depend on individual experiences and subjective interpretations, they may not completely describe the actual impact of AI tools on writing proficiency. Additionally, the study does not account for potential differences in students' academic disciplines. This could influence how AI tools are used and perceived. For example, students in humanities disciplines may engage more deeply with AI-generated feedback on writing style and coherence, while science and engineering students may primarily use AI tools for technical writing and grammar checks. Future research should adopt a mixed-method approach, by incorporating qualitative analyses of AI-assisted writing samples to provide a more comprehensive understanding of AI's impact. In addition to this, investigating discipline-specific variations in AI tool usage could yield more targeted insights for instructional practices.

From the findings, it can be deduced that AI-assisted writing tools function as valuable support systems for students, especially in enhancing grammar and coherence. However, these tools should not be considered as complete substitutes for direct writing instruction. While they provide considerable assistance in refining language use, they do not satisfactorily address the complexities of argument development, structural organization, and higher-order thinking in writing. Thus, educators should incorporate AI tools as part of a general teaching strategy that emphasizes both technological assistance and critical engagement with writing. Encouraging students to critically evaluate AI-generated suggestions and refine their work through guided instruction can help bridge the gap between AI-assisted improvements and the development of independent writing skills. Future research should further explore how AI tools can be optimized to enhance structural organization and argumentation and investigate their long-term impact on students' academic writing proficiency. By assessing and refining the integration of AI into writing instruction on regular basis, educators can ensure that students develop both technical accuracy and strong critical writing skills in an increasingly AI-driven academic setting.

## CONCLUSION

This study investigated how Nigerian university students use AI-assisted writing tools, their perceptions of these tools' impact on writing proficiency, and the ethical concerns associated with their use. The findings suggest that AI tools contribute positively to students' academic literacy, primarily for grammar correction, sentence structure improvement, and vocabulary enhancement. Students generally believe these tools help improve coherence and grammatical accuracy, but their effectiveness in enhancing structural organization appears more limited. Moreover, while many students recognize the benefits of AI-assisted writing, opinions vary, with some expressing concerns about over-reliance on AI and its potential impact on originality and academic integrity.

Despite these insights, the study has some limitations. The reliance on self-reported data means that responses could be influenced by personal biases or varying levels of AI literacy among students. Furthermore, the study does not account for differences across academic disciplines. This could influence how AI tools are used and perceived. A more comprehensive analysis, incorporating qualitative methods such as in-depth interviews or textual comparisons, could provide a deeper understanding of how AI influences writing practices across different fields of study.

Based on these findings, it is recommended that educators integrate AI-assisted writing tools into academic instruction while emphasizing the importance of critical thinking and structural development in writing. AI tools should be used as complementary aids rather than replacements for traditional writing instruction. Universities should also create clear AI usage policies so students know what is acceptable. Teachers should use AI tools as a learning aid, not as a replacement for writing instruction. Future research should compare AI's impact across different academic fields to see where it helps the most.

The study's findings have important implications for both educators and policymakers. As AI continues to shape the academic landscape, universities should establish clear guidelines on ethical AI use while providing students with training on how to use these tools responsibly. Understanding the strengths and limitations of AI-assisted writing can help educators develop balanced approaches that harness technology's benefits while ensuring that students develop essential writing skills.

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