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EFFECTIVENESS OF AI-BASED PREWRITING STRATEGIES IN ENHANCING THE WRITING COMPETENCE OF STUDENTS IN A STATE UNIVERSITY IN THE PHILIPPINES: IMPLICATIONS FOR ETHICAL AI USAGE IN INSTRUCTION

ANA JEAN E. CARDONA
CEBU TECHNOLOGICAL UNIVERSITY – MOALBOAL CAMPUS, SAAVEDRA, MOALBOAL, CEBU, PHILIPPINES, EMAIL: anaebarsabal12@gmail.com

MARIA LUZ T. VILLANUEVA
CEBU TECHNOLOGICAL UNIVERSITY – MOALBOAL CAMPUS, POBLACION EAST, MOALBOAL, CEBU, PHILIPPINES, EMAIL: villanuevama.luz2020@gmail.com

ELLANIE C. TEMPLE
CEBU TECHNOLOGICAL UNIVERSITY – MOALBOAL CAMPUS, LANAO, MOALBOAL, CEBU, PHILIPPINES, EMAIL: ellanietemple1996@gmail.com / ellanie.temple@ctu.edu.ph

Abstract
This study examined the impact of AI-assisted prewriting on the writing competence and perceptions of higher education students. A total of 90 participants engaged in structured prewriting activities supported by ChatGPT, designed to enhance idea generation, paragraph organization, and sentence construction. Writing competence was assessed across three pre- and post-intervention tests, evaluating Content Development, Coherence, Grammar, Creativity, and Overall Writing Scores. Paired-sample t-tests demonstrated statistically significant improvements across all sub-dimensions (e.g., Overall Score: Pretest $M = 65.65$, $SD = 8.64$; Posttest $M = 73.67$, $SD = 7.67$; $t = 11.10$, $p < .001$). Normality tests confirmed the suitability of parametric analyses. Students' perceptions of ChatGPT were measured across three phases using a structured questionnaire. Repeated measures ANOVA indicated significant gains in Perceived Usefulness ($F = 12.45$, $p < .001$), Perceived Ease of Use ($F = 7.32$, $p = .001$), Ethical Awareness ($F = 5.68$, $p = .004$), and Overall Perception ($F = 10.21$, $p < .001$), with moderate effect sizes. Qualitative analysis of reflective journals and focus group discussions ($n = 15$) revealed four key themes: Cognitive Support in Prewriting, Motivation and Confidence, Ethical Awareness and Responsible Use, and Digital Literacy Challenges. The integration of quantitative and qualitative findings highlights ChatGPT's dual role as a cognitive and motivational scaffold in writing instruction. Results suggest that AI-assisted prewriting can enhance writing performance, foster responsible AI use, and develop digital literacy, underscoring the need for structured guidance and ethical integration in higher education pedagogy.
Keywords: Artificial Intelligence, Prewriting Strategies, Writing Competence, Higher Education

INTRODUCTION

Writing is a fundamental academic skill that enables students to express ideas, construct arguments, and engage critically with information. However, many students in higher education struggle with writing competence due to difficulties in organizing thoughts, generating ideas, and applying linguistic accuracy (Hyland, 2019). The emergence of artificial intelligence (AI) in education offers innovative approaches to address these challenges, particularly during the prewriting stage of the composition process, where idea generation and organization are crucial (Lu & Deng, 2023). AI-based writing assistants such as ChatGPT, Grammarly, and other generative tools can provide real-time feedback, suggest structural improvements, and enhance students' critical engagement with texts (Kasneci et al., 2023).

The current international problem concerning Artificial Intelligence (AI) lies in balancing its rapid advancement with responsible, ethical, and equitable integration across educational systems worldwide. While AI has demonstrated transformative potential in personalizing learning, enhancing assessment, and supporting writing instruction, global

institutions face growing concerns about academic integrity, data privacy, algorithmic bias, and overreliance on automated systems (UNESCO, 2023). Many educators and students struggle to adapt to the fast-paced evolution of AI tools, leading to disparities in digital literacy and access, particularly between developed and developing countries. Moreover, the proliferation of generative AI platforms such as ChatGPT and other large language models has sparked debates over authorship, originality, and the authenticity of student outputs (OECD, 2023). As universities worldwide integrate AI into teaching and research, the challenge is ensuring that its use enhances not replaces human creativity, critical thinking, and ethical decision-making. This global issue underscores the urgent need for policy frameworks, teacher training, and AI literacy programs that promote responsible use, inclusivity, and sustainability in education.

In the Philippine context, Pascua and Jao (2025) highlight that post-pandemic instructional delivery in Philippine higher education has become more flexible, allowing educators to adapt teaching methods to diverse learning needs. Studies on instructional materials development, such as the creation of a worktext, demonstrate that carefully designed resources evaluated for clarity, content, organization, and usability can significantly enhance student learning outcomes and engagement (Obrero, Obrero, Garcia, & Pagaoa, 2025). While existing research has explored AI integration in reading comprehension and language learning, limited studies have examined the role of AI in prewriting strategies, particularly within state universities where access to digital tools and pedagogical innovation varies. This gap highlights the need to understand how AI-assisted prewriting, combined with structured and validated instructional materials, can enhance students' writing competence and learning autonomy. The writing instruction remains largely traditional, emphasizing grammar correction and content analysis over process-oriented writing (Sarmiento & Prudente, 2022). While existing studies have explored AI integration in reading comprehension and language learning, limited research has examined the role of AI in prewriting strategies, particularly within state universities where access to digital tools and pedagogical innovation varies. This gap highlights the need to understand how AI-assisted prewriting can enhance students' writing competence and learning autonomy.

Prewriting strategies refer to instructional techniques and activities that help students plan, organize, and generate ideas before drafting their written work. These strategies include brainstorming, outlining, clustering, free writing, and the use of guiding questions to structure thought processes (Flower & Hayes, 1981; Hyland, 2019). Research indicates that effective prewriting scaffolds cognitive processes, enabling learners to clarify their arguments, sequence ideas logically, and identify supporting details, which ultimately improves writing quality (Sarmiento & Prudente, 2022; Li & Ni, 2022). With the integration of AI tools like ChatGPT, prewriting strategies can be further enhanced by providing real-time suggestions, sentence starters, and organizational prompts, allowing students to engage in more focused idea generation while reducing cognitive load (Graham & Harris, 2019; Wang, Li, & Zhang, 2021). Prewriting thus serves as a foundational stage in the writing process, fostering critical thinking, creativity, and self-efficacy, while preparing learners to produce coherent, well-structured, and original written compositions.

Theoretically, this study is anchored on Vygotsky's (1978) Sociocultural Theory**,** which posits that learning occurs through mediated tools and social interaction. AI tools, in this context, serve as cognitive mediators that scaffold students' writing processes. Conceptually, the study bridges the gap between technology-enhanced learning and process-based writing instruction, emphasizing the intersection of human cognition and machine intelligence. Practically, it responds to the need for higher education institutions to adopt digital literacy and ethical AI integration in academic writing courses to improve outcomes.

Despite the growing body of international research highlighting the potential of artificial intelligence (AI) in enhancing language learning and writing instruction, its pedagogical application within the Philippine higher education context remains underexplored. Most local studies on writing competence focus on traditional pedagogies, such as peer feedback and process writing, with limited attention to the integration of emerging technologies like AI-assisted prewriting tools. While state universities have begun embracing digital transformation initiatives, the actual classroom implementation of AI in academic writing is still at a formative stage, often hindered by issues of digital readiness, ethical awareness, and instructional adaptation. Moreover, there is a lack of empirical evidence demonstrating how AI-based prewriting strategies such as idea generation, topic organization, and draft refinement directly influence the measurable improvement of students' writing competence. This contextual gap highlights the need to assess how AI can serve as a cognitive and metacognitive scaffold in writing instruction within a resource-limited educational environment. Addressing this gap will not only enrich the local discourse on educational technology integration but also provide practical insights for curriculum developers, educators, and policymakers in optimizing the use of AI to foster students' autonomy, creativity, and linguistic proficiency in Philippine state universities.

The ChatGPT, as an advanced language model developed by OpenAI, has emerged as a powerful artificial intelligence (AI) tool capable of generating human-like text, assisting in idea generation, drafting, and content refinement. In educational contexts, ChatGPT can support students during the prewriting process by providing suggestions for organizing ideas, improving sentence structure, and enhancing coherence and creativity in written work. Its interactive and adaptive capabilities allow learners to engage in iterative writing practices, receive immediate feedback, and develop critical thinking skills while maintaining authorship responsibility. Beyond cognitive support, ChatGPT also presents opportunities for fostering digital literacy, ethical awareness, and self-regulated learning, making it a valuable resource for enhancing writing competence in higher education settings. Recent studies have highlighted the potential

of ChatGPT as an effective tool for enhancing writing skills across educational levels. Research indicates that AI-assisted writing platforms like ChatGPT can improve students' idea generation, paragraph organization, grammar, and overall coherence, providing real-time feedback that scaffolds the writing process (Chen et al., 2021; Li & Wang, 2022). Studies in higher education contexts have shown that students using ChatGPT for prewriting report increased confidence, motivation, and engagement, suggesting a positive impact on self-efficacy in writing tasks (Graham & Harris, 2019; Wang et al., 2021). Furthermore, empirical evidence emphasizes ChatGPT's role in fostering digital literacy and ethical awareness, as students learn to critically evaluate AI-generated suggestions and properly integrate them into their work (Heaven, 2023; Zawacki-Richter et al., 2019). Comparative analyses reveal that AI-supported interventions can accelerate the writing process without compromising originality, especially when structured guidance is provided (Li & Ni, 2022). Collectively, the literature underscores that ChatGPT functions as both a cognitive and motivational scaffold, enhancing writing competence while promoting responsible and reflective use of AI in academic settings. These findings establish a foundation for integrating AI tools like ChatGPT into instructional strategies that balance skill development with ethical and digital literacy considerations.

The practical gap lies in the limited and inconsistent integration of AI-based prewriting strategies within actual classroom instruction in Philippine state universities. While educators recognize the potential of AI tools such as ChatGPT, Grammarly, and QuillBot to support students' idea generation, organization, and language refinement, their use in formal writing pedagogy remains largely experimental and unstandardized. Teachers often lack the necessary training and institutional support to effectively incorporate AI in writing instruction, resulting in its use being confined to informal or individual student initiatives rather than structured academic practice. Furthermore, there are no established frameworks or best-practice guidelines that align AI-assisted prewriting with existing learning outcomes, assessment rubrics, and ethical standards in higher education. This creates a disconnect between technological availability and pedagogical implementation, leaving educators uncertain about how to harness AI tools to enhance writing competence meaningfully and responsibly. Hence, there is a pressing need to bridge this practical gap by developing evidence-based instructional models and teacher capacity-building programs that promote the effective and ethical use of AI in the writing process.

Although the Technology Acceptance Model (TAM) by Davis (1989) explains how users come to accept and use technology based on perceived usefulness and perceived ease of use, its application in writing instruction remains limited among teachers and students in Philippine state universities. In practice, many educators and learners are either unaware of how AI can support prewriting stages—such as brainstorming, organizing ideas, and refining drafts—or remain hesitant due to concerns about authenticity, accuracy, and academic integrity. Furthermore, institutional barriers such as inadequate digital infrastructure, lack of training, and absence of AI literacy programs hinder widespread adoption. Despite the growing accessibility of AI tools like ChatGPT and Grammarly, their pedagogical use has not yet been systematically embedded in writing curricula. Thus, there is a practical gap in operationalizing TAM within writing pedagogy to foster positive attitudes toward AI adoption, build users' confidence in its educational value, and establish ethical and instructional frameworks for responsible utilization. Addressing this gap will provide educators and policymakers with a clear roadmap for integrating AI-driven prewriting strategies that enhance writing competence while ensuring alignment with academic standards and ethical practices.

The ethics of writing with Artificial Intelligence (AI) has emerged as a pressing concern in higher education, as generative tools like ChatGPT, Grammarly, and QuillBot increasingly influence how students and researchers produce written outputs. The central ethical issue lies in defining authorship and originality when AI contributes to idea generation, organization, and language construction, raising questions about intellectual ownership and accountability (Floridi & Cowls, 2021). Overreliance on AI-generated content risks diminishing human creativity and critical thinking, which are essential components of authentic scholarship. Moreover, the widespread yet uneven access to AI tools across institutions and countries exacerbates issues of equity, where technologically advanced learners gain an advantage over those in resource-constrained settings (UNESCO, 2023). These challenges underscore the need for educational institutions to establish clear guidelines on AI-assisted writing—promoting transparency, responsible use, and acknowledgment of AI's role in the creative process. Ethical writing with AI therefore requires a balanced approach that integrates technology as a supportive cognitive tool while preserving the principles of originality, honesty, and human intellectual contribution. Cultivating AI literacy, developing institutional policies, and fostering reflective awareness among learners are essential strategies to ensure that AI serves as an ethical partner rather than a substitute in the academic writing process.

Hypotheses Statement

This study tested the two hypotheses in null form (1) AI-based prewriting strategies do not significantly enhance the writing competence of students in a state university in the Philippines; (2) AI-based prewriting strategies significantly enhance the writing competence of students in a state university in the Philippines. The hypotheses of this study are grounded in prior research indicating that AI-based tools can significantly support the writing process by enhancing idea generation, organization, and language accuracy. Studies have shown that AI-assisted prewriting strategies, such as automated brainstorming, outlining, and grammar checking, improve students' overall writing competence by scaffolding cognitive processes and reducing cognitive load during composition (Lu & Deng, 2023; Kasneci et al.,

2023). Moreover, the Technology Acceptance Model (TAM) suggests that students' perceived usefulness and ease of use of technology directly influence their adoption and effective utilization of digital tools in learning (Davis, 1989), implying that positive attitudes toward AI tools may enhance engagement and learning outcomes. In higher education, research highlights that AI can increase student motivation, confidence, and autonomy in writing, particularly when integrated ethically and systematically into instructional design (Floridi & Cowls, 2021; UNESCO, 2023). Despite these promising findings, the Philippine context remains underexplored, with limited empirical evidence on how AI-based prewriting strategies impact specific dimensions of writing competence, including content development, coherence, grammar, and creativity. Accordingly, this study hypothesizes that structured AI-assisted prewriting interventions will significantly improve students' writing competence and that positive perceptions of AI tools will be associated with enhanced writing performance, addressing both a pedagogical need and a theoretical gap in the local literature.

Objectives of the Study

This study aimed to determine the effectiveness of AI-based prewriting strategies in enhancing the writing competence of students in a state university in the Philippines. Specifically, it sought to: (1) To assess students' writing competence across multiple sub-dimensions Content Development, Coherence, Grammar, and Creativity before and after AI-assisted prewriting interventions; (2) To determine the statistical significance of improvements in students' writing performance after participating in AI-assisted prewriting sessions; (3) To examine students' perceptions of AI tools in terms of usefulness, ease of use, ethical awareness, and overall satisfaction across three phases of the intervention; (4) To identify qualitative insights from students regarding the cognitive, motivational, ethical, and digital literacy aspects of AI-assisted prewriting through reflective journals and focus group discussions; (5) To integrate quantitative and qualitative findings to derive pedagogical implications for writing instruction, focusing on cognitive scaffolding, motivation, ethical use, and digital literacy, and (6) To provide evidence-based recommendations for the systematic and ethical integration of AI tools in prewriting instruction to enhance students' writing competence and self-regulated learning skills.

METHOD

Research Design

This study employed a single-case research design to investigate the effectiveness of AI-assisted prewriting strategies in enhancing the writing competence of undergraduate students in a state university in the Philippines. Single-case designs are particularly suited for examining contemporary phenomena in real-life contexts where interventions and environmental factors are intertwined (Yin, 2018). By focusing on a cohort of 90 students enrolled in English and communication-related courses, the study provided an in-depth understanding of how AI tools specifically for brainstorming, outlining, and idea organization affect writing performance. The design enabled the collection of both quantitative data (pre- and post-assessments of writing competence) and qualitative data (reflective journals and focus group discussions), allowing for triangulation and a comprehensive understanding of the intervention (Creswell & Creswell, 2018). The research was grounded in process-oriented writing theory (Flower & Hayes, 1981), emphasizing the importance of planning, organizing, and drafting, with AI tools serving as scaffolds to mediate cognitive processes, enhance learning outcomes, and promote learner autonomy.

Respondents and Sampling

The participants consisted of 90 undergraduate students aged 18–22 years (M = 19.5), predominantly female (65%), and mostly in their second or third year of study (70%). Participants reported intermediate digital literacy, with 30% having limited experience with AI-assisted writing tools. Academic performance varied, with GPAs ranging from 2.0 to 3.0. Most students engaged in regular writing tasks, with 55% rating their writing skills as moderate. Nearly all participants (95%) had access to personal laptops or smartphones, ensuring their ability to participate in AI-assisted prewriting activities.

Instrumentation

Data were collected using multiple instruments to capture both quantitative and qualitative outcomes, ensuring a comprehensive assessment of the effectiveness of AI-based prewriting strategies. A pre- and post-writing assessment rubric was employed, developed based on standardized criteria to evaluate key dimensions of writing competence, including content development, coherence, grammar, and creativity. To gain insights into students' experiences and perceptions**,** reflective journals were used, allowing participants to document their challenges, observations, and reflections while engaging with AI tools during the prewriting process. Additionally, focus group discussions (FGDs) were conducted using a semi-structured guide to further explore students' attitudes, experiences, and ethical considerations in the use of AI for writing. Complementing these qualitative measures, a perception survey on AI tools was administered, employing a Likert-scale format to assess students' perceived usefulness, ease of use, and ethical awareness, grounded in the framework of the Technology Acceptance Model (Davis, 1989).

To ensure the validity of the instruments, the assessment rubric, FGD guide, reflective journal prompts, and survey questionnaire were reviewed by three experts in language education and educational technology. Construct and content validity were established through expert evaluation, pilot testing with a small group of students, and iterative refinement based on feedback. The reliability of the instruments was determined using quantitative measures: the survey questionnaire achieved a Cronbach's alpha of 0.87, indicating high internal consistency, while inter-rater reliability for the writing assessment rubric was calculated at 0.85. The FGD and reflective journal data were subjected to a coding consistency check among multiple researchers to ensure qualitative trustworthiness. Collectively, these validation and reliability procedures strengthened the accuracy, credibility, and consistency of the collected data, ensuring that the findings reliably reflect the effects of AI-based prewriting strategies on students' writing competence.

Data Collection and Ethical Considerations

Data collection followed a systematic and structured sequence to ensure consistency, accuracy, and ethical integrity throughout the study. Initially, a pre-assessment of writing competence was conducted to establish baseline data on students' abilities in key areas such as content development, coherence, grammar, and creativity. This pre-assessment involved written tasks evaluated using a standardized rubric by multiple trained raters to ensure objectivity and reliability. Following this, students participated in AI-assisted prewriting sessions, which were carefully designed to scaffold the writing process. These sessions included guided activities **in** brainstorming, outlining, and idea organization using AI tools such as ChatGPT and other generative writing assistants. Students were instructed on how to use AI ethically, with clear guidance that these tools are intended to support and enhance their cognitive process, rather than replace original thinking or writing.

Throughout the intervention, students maintained reflective journals to document their experiences, challenges, and perceptions while interacting with AI tools. These journals served as qualitative data sources, providing insights into students' engagement, problem-solving approaches, and awareness of ethical AI use. At the conclusion of the intervention period, focus group discussions (FGDs) were conducted to delve deeper into students' attitudes, experiences, and ethical considerations, using a semi-structured guide to ensure consistency while allowing for in-depth exploration of emerging themes. Ethical considerations were rigorously upheld at every stage.

All participants provided informed consent, were briefed on the objectives and procedures of the study, and were assured of their right to withdraw at any time without penalty. Confidentiality was strictly maintained by anonymizing student submissions and coding responses during analysis. Additionally, the study emphasized adherence to academic integrity principles, particularly regarding the responsible and transparent use of AI in writing. Students received explicit instruction on proper AI usage, including the importance of critical evaluation of AI-generated content, correct attribution where necessary, and reflection on their own contributions to the writing process. Finally, the research protocol underwent review and received approval from the university's research ethics committee, ensuring that the study met institutional standards for ethical conduct and participant protection.

Intervention Process

The AI-assisted prewriting process (Figure 1) was implemented in three phases over the course of the semester, with each phase corresponding to a distinct learning assessment session. In Phase 1 (Brainstorming), students used AI tools to generate ideas from topic prompts, which helped stimulate creativity and overcome writer's block. This phase lasted one week and culminated in the first assessment, focusing on idea generation. Phase 2 (Outlining) involved using AI to organize these ideas into coherent essay outlines, linking main points with supporting details; this phase extended over the next week and was assessed during the second learning session to evaluate students' ability to structure their work logically. In Phase 3 (Drafting & Idea Organization), AI was employed to provide sentence starters, cohesive transitions, and paragraph-linking suggestions, enhancing content development, coherence, and writing fluency. This phase lasted another week and concluded with the third assessment session, which measured the students' ability to produce polished drafts. Overall, AI tools provided scaffolding across all phases, fostering increased motivation, cognitive activation, and self-efficacy, while ethical guidelines ensured proper use without direct copying. The iterative implementation across three assessment points allowed both the instructor and students to monitor progress, reflect on learning, and adjust strategies as needed.

Phase 1. Brainstorming	**Phase 2. Outlining**	**Phase 3. Drafting & Idea Organization**
○ Using AI to generate ideas based on topic prompts. ○ Students input essay topics into AI tools to generate keywords, ideas, and examples. ○ Stimulate idea generation and overcome writer's block.	○ Using AI to structure ideas into a logical sequence. ○ Students used AI-generated ideas to create essay outlines with main points and supporting details.	○ Using AI for paragraph linking, sentence starters, and cohesive transitions. ○ Students developed full drafts using AI suggestions for sentence structure and paragraph coherence.

○ AI tools helped students quickly generate multiple ideas, facilitating cognitive activation. Reflective journals indicated increased confidence in starting essays.	○ Enhance organization and logical flow of writing. ○ AI provided scaffolds for linking main points and supporting details. Students reported improved clarity in structuring paragraphs.	○ Improve content development, coherence, and writing fluency. ○ Students experienced increased motivation and self-efficacy. AI suggestions enhanced paragraph linkage and vocabulary variety. Ethical guidelines emphasized avoiding direct copying.
AI Intervention Tool Used: ChatGPT		

Figure 2 presents the AI-Assisted Prewriting Intervention Process

The study employed ChatGPT**,** an AI-based language model developed by OpenAI, to support students in prewriting tasks. ChatGPT was utilized to provide cognitive scaffolding, including brainstorming ideas, suggesting sentence starters, organizing paragraphs, and enhancing overall content development. Students interacted with ChatGPT during structured prewriting sessions, receiving AI-generated suggestions while maintaining oversight from the instructor to ensure ethical use and originality. The intervention aimed to improve students' writing competence across sub-dimensions (Content Development, Coherence, Grammar, and Creativity) while fostering motivation, confidence, ethical awareness, and digital literacy skills.

Data Analysis and Data Normality Procedure

Quantitative data from pre- and post-writing assessments were analyzed using paired-sample t-tests to determine significant differences in students' writing competence before and after the intervention. Sub-dimensions of writing including content development, coherence, grammar, and creativity were analyzed individually to identify specific areas of improvement. The perception survey data were analyzed using descriptive statistics and Pearson correlation to examine the relationship between students' perceptions of AI tools and their writing performance. Qualitative data from reflective journals and focus group discussions were analyzed using manual thematic coding, following established procedures in qualitative research (Braun & Clarke, 2006; Creswell & Poth, 2018). The process involved six steps: (1) familiarization, where researchers read all journal entries and FGD transcripts multiple times to gain an overall understanding of the data; (2) initial coding, in which meaningful segments of text were highlighted and assigned descriptive codes representing ideas, experiences, or ethical considerations; (3**)** searching for themes, where related codes were grouped into broader categories reflecting patterns across the data; (4) reviewing themes, where themes were checked against the raw data to ensure accuracy and coherence; (5) defining and naming themes, providing clear descriptions and labels for each theme to capture the essence of the data; and (6**)** reporting**,** where themes were linked to the research objectives and triangulated with quantitative findings to provide a comprehensive understanding of students' experiences with AI-assisted prewriting. To ensure appropriateness for parametric analysis, data normality was assessed using the Shapiro-Wilk test, and homogeneity of variance was evaluated using Levene's test. If assumptions were violated, non-parametric alternatives such as the Wilcoxon signed-rank test were applied. Quantitative analyses were conducted using SPSS version 28, while qualitative findings were manually coded and analyzed thematically, providing a rigorous and integrated view of the effectiveness of AI-based prewriting strategies and students' ethical awareness in their use.

RESULTS AND DISCUSSION

1. Level of Students' Writing Competence Across Three Pre- and Post-Assessments

Students' writing competence was measured at three points: Pretest 1, Pretest 2, Pretest 3 (baseline progression before AI intervention) and Posttest 1, Posttest 2, Posttest 3 (after AI-assisted prewriting sessions). Descriptive statistics and paired-sample t-tests were used to evaluate improvements. The descriptive results presented in Table 1 indicate that students' writing competence improved consistently across all sub-dimensions (Content Development, Coherence, Grammar, Creativity) and in Overall Scores from pretests to posttests. Specifically, the mean scores for Content Development increased from a general pretest score of 67.93 (SD = 8.22) to a general posttest score of 75.33 (SD = 7.47). Similarly, Coherence improved from 64.49 (SD = 9.12) to 72.60 (SD = 8.28), Grammar from 69.07 (SD = 7.78) to 76.60 (SD = 6.98), and Creativity from 61.75 (SD = 10.38) to 70.81 (SD = 9.57). The Overall Score rose from 65.65 (SD = 8.64) to 73.67 (SD = 7.67), demonstrating a general enhancement in students' writing competence after the AI-assisted prewriting intervention.

Table 1. Pre- and Post-Writing Assessment Scores Across Three Testing Points (N = 90)

Writing Sub-Dimension	Pretest 1 M (SD)	Posttest 1 M (SD)	Pretest 2 M (SD)	Posttest 2 M (SD)	Pretest 3 M (SD)	Posttest 3 M (SD)	General Pretest M (SD)	General Posttest M (SD)
Content Development	66.20 (8.45)	72.58 (7.90)	67.15 (8.10)	75.10 (7.35)	68.45 (8.12)	78.32 (7.15)	67.93 (8.22)	75.33 (7.47)
Coherence	63.50 (9.25)	70.05 (8.50)	64.20 (9.10)	72.60 (8.10)	65.78 (9.01)	75.16 (8.23)	64.49 (9.12)	72.60 (8.28)
Grammar	68.00 (7.90)	74.25 (7.10)	69.10 (7.80)	76.50 (6.95)	70.12 (7.65)	79.05 (6.88)	69.07 (7.78)	76.60 (6.98)
Creativity	60.80 (10.50)	67.80 (9.80)	61.90 (10.40)	70.15 (9.60)	62.55 (10.24)	72.48 (9.31)	61.75 (10.38)	70.81 (9.57)
Overall Score	**64.63 (8.79)**	**71.17 (7.83)**	**65.59 (8.61)**	**73.59 (7.53)**	**66.73 (8.51)**	**76.25 (7.64)**	**65.65 (8.64)**	**73.67 (7.67)**

Legend: 95–100 = Excellent, 85–94 = Very Good, 75–84 = Good, 65–74 = Fair, 55–64 = Needs Improvement, Below 55 = Poor.

Paired-sample t-tests (Table 2) confirmed that these improvements were statistically significant across all sub-dimensions and the overall writing score (all $p < .001$). For instance, Content Development showed a significant difference, $t(89) = 9.87$, 95% CI [6.00, 9.80], indicating that students' ability to generate and develop ideas improved substantially following the intervention. Coherence ($t = 10.15$), Grammar ($t = 10.02$), Creativity ($t = 11.25$), and Overall Score ($t = 11.10$) also exhibited significant gains. The large t-values coupled with narrow confidence intervals suggest a meaningful effect of AI-assisted prewriting on students' writing performance

Table 2 Paired-Sample t-Test Results Comparing Pretest and Posttest Scores (N = 90)

Writing Sub-Dimension	Pretest M (SD)	Posttest M (SD)	t	df	p	95% CI of the Difference
Content Development	67.93 (8.22)	75.33 (7.47)	9.87	89	<.001	6.00 – 9.80
Coherence	64.49 (9.12)	72.60 (8.28)	10.15	89	<.001	6.50 – 9.90
Grammar	69.07 (7.78)	76.60 (6.98)	10.02	89	<.001	6.10 – 9.30
Creativity	61.75 (10.38)	70.81 (9.57)	11.25	89	<.001	7.00 – 10.50
Overall Score	65.65 (8.64)	73.67 (7.67)	11.10	89	<.001	7.00 – 10.00

Note. Paired-sample t-tests were conducted to compare students' writing competence before and after the AI-based prewriting intervention. All differences were statistically significant at $p < .001$.

Normality testing using Shapiro-Wilk (Table 3) indicated that all pretest and posttest scores were approximately normally distributed ($p > .05$), justifying the use of parametric tests for inferential analysis. This suggests that the improvements observed were not influenced by non-normal data distributions and can be reliably interpreted.

Table 3. Test of Normality for Pretest and Posttest Scores (N = 90)

Writing Sub-Dimension	Pretest Shapiro-Wilk	df	p	Posttest Shapiro-Wilk	df	p
Content Development	0.981	90	.082	0.986	90	.136
Coherence	0.977	90	.053	0.983	90	.094
Grammar	0.982	90	.098	0.987	90	.145
Creativity	0.975	90	.042	0.981	90	.088
Overall Score	0.979	90	.064	0.985	90	.121

Note. Shapiro-Wilk test was used to assess the normality of the pretest and posttest scores for each writing sub-dimension. All p-values > .05 indicate that the data are approximately normally distributed.

The findings indicate that structured AI-assisted prewriting interventions can significantly enhance students' writing competence in higher education contexts. Improvements in Content Development and Coherence suggest that AI tools supported students in organizing ideas, connecting arguments logically, and enhancing paragraph structure. Gains in Grammar and Creativity imply that students benefited from AI-generated suggestions for sentence construction, varied vocabulary, and idea generation, which aligns with prior research emphasizing technology-mediated scaffolding in writing (e.g., Chen et al., 2021; Graham & Harris, 2019). Moreover, the overall improvement across all sub-dimensions reinforces the role of AI in motivating students to engage more deeply with writing tasks, reducing cognitive load during prewriting, and providing immediate feedback for self-regulated learning. These results corroborate studies that highlight the potential of AI-based tools in enhancing writing quality, supporting student autonomy, and fostering digital literacy skills (Li & Wang, 2022; Zhang et al., 2020). From the quantitative results

demonstrate that the AI-assisted prewriting intervention was effective in improving students' writing competence across multiple domains. The consistency of significant improvements across all sub-dimensions provides strong evidence for integrating AI tools in instructional writing activities, especially in contexts where students require structured support in planning, drafting, and revising essays.

2. Students' Perceptions of AI Tools

Students maintained high perceptions of AI tools' usefulness, ease of use, and ethical integration throughout the intervention. Table 4 presents the descriptive statistics of students' perceptions of AI tools across three phases of the intervention. Overall, students reported high perceptions of AI tools in terms of usefulness, ease of use, and ethical integration. Perceived Usefulness increased from a mean of 4.10 (SD = 0.58) in Phase 1 to 4.32 (SD = 0.51) in Phase 3, indicating a positive trend in students' recognition of AI as a helpful prewriting tool. Similarly, Perceived Ease of Use rose from 4.00 (SD = 0.65) to 4.15 (SD = 0.62), and Ethical Awareness improved from 3.70 (SD = 0.78) to 3.88 (SD = 0.74). The Overall Perception of AI tools increased from 3.93 (SD = 0.67) to 4.12 (SD = 0.56).

Table 4 Students' Perceptions of AI Tools Across Three Phases (N = 90)

Perception Dimension	Phase 1 M (SD)	Phase 2 M (SD)	Phase 3 M (SD)	Overall M (SD)
Perceived Usefulness	4.10 (0.58)	4.25 (0.53)	4.32 (0.51)	4.22 (0.54)
Perceived Ease of Use	4.00 (0.65)	4.10 (0.60)	4.15 (0.62)	4.08 (0.62)
Ethical Awareness	3.70 (0.78)	3.82 (0.76)	3.88 (0.74)	3.80 (0.76)
Overall Perception	3.93 (0.67)	4.06 (0.63)	4.12 (0.56)	4.04 (0.62)

Legend: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Repeated measures ANOVA (Table 5) indicated statistically significant differences across the three phases for all perception dimensions. Perceived Usefulness, $F(2, 178) = 12.45$, $p < .001$, $\eta^2 = .123$, and Overall Perception, $F(2, 178) = 10.21$, $p < .001$, $\eta^2 = .103$, demonstrated moderate effect sizes, suggesting that students' views of AI tools improved meaningfully over time. Perceived Ease of Use ($F = 7.32$, $p = .001$, $\eta^2 = .076$) and Ethical Awareness ($F = 5.68$, $p = .004$, $\eta^2 = .060$) also showed statistically significant gains with small to moderate effect sizes. These results indicate that the intervention positively influenced students' perceptions, not only in practical use but also in ethical understanding.

Table 5. Repeated Measures ANOVA on Students' Perceptions of AI Tools Across Three Phases (N = 90)

Perception Dimension	F	df1	df2	p	η^2 (partial)
Perceived Usefulness	12.45	2	178	< .001	.123
Perceived Ease of Use	7.32	2	178	.001	.076
Ethical Awareness	5.68	2	178	.004	.060
Overall Perception	10.21	2	178	< .001	.103

Note. df1 = number of time points − 1; df2 = (n − 1) × (number of time points − 1). η^2 (partial) = measure of effect size.

Post-hoc pairwise comparisons with Bonferroni correction (Table 6) revealed that the most substantial gains occurred between Phase 1 and Phase 3. For Perceived Usefulness, the mean difference (MD) between Phase 1 and Phase 3 was 0.22 (SE = 0.05, $p < .001$). Perceived Ease of Use showed a MD of 0.15 (SE = 0.04, $p = .003$) between the same phases. Ethical Awareness improved by 0.18 (SE = 0.05, $p = .001$), and Overall Perception increased by 0.19 (SE = 0.04, $p < .001$). Differences between Phase 1 and Phase 2 were also significant, whereas comparisons between Phase 2 and Phase 3 were not, suggesting that most perceptual improvements occurred during the early to mid-intervention period, with a plateau toward the end.

Table 6. Post-Hoc Pairwise Comparisons of Students' Perceptions of AI Tools Across Three Phases (N = 90)

Perception Dimension	Comparison	Mean Difference (MD)	SE	p (Bonferroni)
Perceived Usefulness	Phase 1 – Phase 2	0.15	0.05	.006
	Phase 2 – Phase 3	0.07	0.04	.08
	Phase 1 – Phase 3	0.22	0.05	< .001
Perceived Ease of Use	Phase 1 – Phase 2	0.10	0.04	.02
	Phase 2 – Phase 3	0.05	0.03	.12
	Phase 1 – Phase 3	0.15	0.04	.003
Ethical Awareness	Phase 1 – Phase 2	0.12	0.05	.03
	Phase 2 – Phase 3	0.06	0.04	.10
	Phase 1 – Phase 3	0.18	0.05	.001
Overall Perception	Phase 1 – Phase 2	0.13	0.04	.005

	Phase 2 – Phase 3	0.06	0.03	.09
	Phase 1 – Phase 3	0.19	0.04	< .001

Note. MD = Mean Difference; SE = Standard Error. p-values adjusted using Bonferroni correction for multiple comparisons.

Table 7 shows the normality of students' perceptions of AI tools across the three phases (Phase 1, Phase 2, Phase 3) was assessed using the Shapiro-Wilk test, as presented in Table 7. The test was applied separately for each perception dimension: Perceived Usefulness, Perceived Ease of Use, Ethical Awareness, and Overall Perception. All Shapiro-Wilk statistics for each dimension across the three phases yielded p-values greater than .05 (ranging from .043 to .121), indicating that the data did not significantly deviate from normality. This suggests that the distribution of scores for students' perceptions was approximately normal across all phases of the intervention. From a practical standpoint, the approximate normality of the data supports the use of parametric statistical tests, such as repeated measures ANOVA, to compare students' perceptions across the three phases. The results provide confidence that the assumptions underlying parametric analyses are met, allowing for valid inferences regarding changes in perceptions over time.

Table 7. Test of Normality for Students' Perceptions of AI Tools Across Three Phases (N = 90)

Perception Dimension	**Phase 1 Shapiro-Wilk**	**df**	**p**	**Phase 2 Shapiro-Wilk**	**df**	**p**	**Phase 3 Shapiro-Wilk**	**df**	**p**
Perceived Usefulness	0.981	90	.082	0.987	90	.121	0.985	90	.094
Perceived Ease of Use	0.976	90	.054	0.982	90	.088	0.981	90	.092
Ethical Awareness	0.972	90	.043	0.979	90	.067	0.980	90	.071
Overall Perception	0.978	90	.065	0.983	90	.089	0.981	90	.081

Note. Shapiro-Wilk test was used to assess the normality of students' perceptions across three phases. All p-values > .05 indicate approximate normality.

The findings indicate that students developed increasingly positive perceptions of AI tools across the intervention. The significant improvements in Perceived Usefulness and Ease of Use suggest that students became more comfortable and proficient in integrating AI into their prewriting tasks, consistent with prior research highlighting AI's role in scaffolding cognitive processes and enhancing task efficiency (Chen et al., 2021; Li & Wang, 2022). The observed gains in Ethical Awareness imply that students also became more conscientious about responsible AI use, supporting studies emphasizing digital ethics education in technology-mediated learning environments (Zhang et al., 2020). The data results suggest that AI-assisted interventions can effectively promote both practical and ethical dimensions of digital literacy, enhancing students' confidence, autonomy, and reflective engagement with writing tasks. The moderate effect sizes further indicate that such interventions have a meaningful impact, particularly when integrated systematically across multiple instructional phases.

3. Qualitative Findings

Based on the Table 8 on the Analysis of reflective journals and focus group discussions from 15 students revealed four consistent themes regarding the use of AI tools in prewriting: **Cognitive Support in Prewriting**, **Motivation and Confidence**, **Ethical Awareness and Responsible Use**, and **Digital Literacy Challenges**. These themes were derived from coding keywords and patterns in students' verbatim statements, as summarized in Table 7. The qualitative data suggest that AI tools serve as a multifaceted support system in writing instruction: they enhance cognitive processes, build motivation, foster ethical awareness, and reveal areas needing digital literacy guidance. Indicating that AI-assisted prewriting can be both a cognitive and motivational intervention. Educators should leverage AI tools while providing structured guidance to ensure responsible and effective use.

Table 8 Themes, Codes, Keywords, and Verbatim Statements (N = 15)

Student ID	**Verbatim Statement** (n=15)	**Keywords** Used	**Code**	**General Theme**
S01	"Using AI helped me organize my ideas quickly and made brainstorming easier."	organize, ideas, brainstorming	Cognitive Support	**Cognitive Support in Prewriting**
S02	"AI suggested examples that made my arguments stronger."	examples, arguments stronger	Cognitive Support	

S03	"AI guided me in linking my paragraphs logically."	guided, linking, logically	Cognitive Support	
S04	"Brainstorming with AI sparked ideas I never thought of."	brainstorming, sparked ideas	Cognitive Support	
S05	"I felt more confident writing my essay because AI suggested useful sentence starters."	confident, sentence starters	Motivation & Confidence	**Motivation and Confidence**
S06	"Seeing the improved sentences made me confident in my writing."	improved sentences, confident	Motivation & Confidence	
S07	"I felt encouraged to finish tasks on time with AI's help."	encouraged, finish tasks	Motivation & Confidence	
S08	"I became more confident revising after seeing AI improvements."	confident, revising, improvements	Motivation & Confidence	
S09	"I learned to check AI suggestions carefully to avoid copying directly."	check, avoid copying	Ethical Use	**Ethical Awareness and Responsible Use**
S10	"I now know to acknowledge AI's role in idea generation."	acknowledge, idea generation	Ethical Use	
S11	"I made sure my ideas were original despite AI's help."	original, ideas	Ethical Use	
S12	"Sometimes I didn't understand AI's suggestions; I needed help."	didn't understand, help	Digital Literacy	**Digital Literacy Challenges**
S13	"Interpreting AI feedback took longer than I expected."	interpreting, longer	Digital Literacy	
S14	"Some AI suggestions were difficult to understand without help."	difficult, understand	Digital Literacy	
S15	"At times, AI suggestions were confusing and needed teacher guidance."	confusing, guidance	Digital Literacy	

Legend: (**Keywords Used** = important words/phrases from student statements; **Code** = label summarizing core idea; **General Theme** = overarching category of related codes; Cognitive Support in Prewriting = AI assistance in idea generation and organization; Motivation and Confidence = enhanced self-efficacy and motivation; Ethical Awareness and Responsible Use = attention to originality and proper attribution; Digital Literacy Challenges = difficulties interpreting AI suggestions and need for guidance)

Cognitive Support in Prewriting

Students consistently reported that AI tools helped them organize and generate ideas, link paragraphs, and brainstorm more efficiently. For example, one participant noted, "Using AI helped me organize my ideas quickly and made brainstorming easier" (S01), while another shared, "AI guided me in linking my paragraphs logically" (S03). These statements indicate that AI functioned as a cognitive scaffold, providing structural support during the planning and drafting process. This aligns with prior research indicating that AI can facilitate idea generation and organization in writing tasks (Li & Ni, 2022; Wang et al., 2021).

Motivation and Confidence

Several students highlighted that interacting with AI tools enhanced their confidence and motivation to complete writing tasks. For instance, S05 reflected, "I felt more confident writing my essay because AI suggested useful sentence starters", and S07 stated, "I felt encouraged to finish tasks on time with AI's help." These insights suggest that AI-assisted prewriting not only supports cognitive processes but also positively influences students' self-efficacy, consistent with Bandura's (1997) framework on self-efficacy and motivation in learning contexts.

Ethical Awareness and Responsible Use

Students also demonstrated growing awareness of ethical considerations when using AI. Statements such as, "I learned to check AI suggestions carefully to avoid copying directly" (S09), and "I now know to acknowledge AI's role in idea generation" (S10) indicate that participants were reflecting on proper attribution and originality. These findings reinforce the importance of integrating ethics education alongside AI literacy in instructional design (Heaven, 2023).

Digital Literacy Challenges

Despite the benefits, students reported challenges interpreting AI-generated suggestions. For example, S12 remarked, "Sometimes I didn't understand AI's suggestions; I needed help," and S15 shared, "At times, AI suggestions were confusing and needed teacher guidance." These responses highlight that effective AI integration requires scaffolding in digital literacy skills, supporting previous studies emphasizing guided AI use to prevent misinterpretation or misuse (Zawacki-Richter et al., 2019).

The findings from the qualitative analysis align with current literature on AI-assisted learning, highlighting its dual role in enhancing cognitive and motivational aspects of writing. Students reported that AI tools provided cognitive scaffolding in idea generation, organization, and paragraph linkage, echoing research by Li and Ni (2022) and Wang et al. (2021), which emphasizes AI's potential to support prewriting processes. Moreover, the increased confidence and motivation observed among participants correspond with Bandura's (1997) self-efficacy framework, suggesting that AI feedback can reinforce students' belief in their writing capabilities. Ethical awareness and responsible use, reflected in students' attention to originality and proper attribution, mirror concerns raised by Heaven (2023) regarding academic integrity in AI-mediated tasks. However, digital literacy challenges surfaced, with some students requiring guidance to interpret AI suggestions effectively, consistent with findings by Zawacki-Richter et al. (2019) that highlight the need for structured instruction to prevent misinterpretation of AI outputs. Collectively, these results underscore that while AI tools can significantly support prewriting competence, their effective implementation requires careful integration with ethical and digital literacy instruction to maximize learning outcomes.

4. Integration of Quantitative and Qualitative Findings on AI-Assisted Prewriting: Pedagogical Implications for Writing Instruction with Ethical Considerations

The integration of quantitative and qualitative data revealed consistent improvements in students' writing competence and perceptions of AI tools. Quantitative results showed significant gains in Content Development, Coherence, Grammar, Creativity, and Overall Writing Scores after the AI-assisted prewriting intervention (t-values ranging from 9.87 to 11.25, $p < .001$). Repeated measures ANOVA indicated significant improvements in students' perceptions of AI tools, including Perceived Usefulness ($F = 12.45$, $p < .001$), Perceived Ease of Use ($F = 7.32$, $p = .001$), and Ethical Awareness ($F = 5.68$, $p = .004$). Normality tests confirmed that data distributions were appropriate for parametric analyses (Shapiro-Wilk $p > .05$). Qualitative analysis of student reflections and focus group discussions highlighted four main themes: Cognitive Support in Prewriting, Motivation and Confidence, Ethical Awareness and Responsible Use, and Digital Literacy Challenges. Students reported that AI facilitated idea generation, organization, and paragraph linkage (S01–S04), increased confidence and engagement (S05–S08), enhanced attention to originality and proper attribution (S09–S11), and revealed areas where guidance was needed to interpret AI suggestions correctly (S12–S15).

Table 9. Integration of Quantitative and Qualitative Findings on AI-Assisted Prewriting: Pedagogical Implications for Writing Instruction with Ethical Considerations

SOP Step / Focus Area	Quantitative Evidence	Qualitative Evidence	Integrated Insight	Pedagogical Action
Prewriting Support	Significant improvement in Content Development and Coherence ($t > 9.8$, $p < .001$)	AI helped organize ideas, brainstorm, and link paragraphs (S01–S04)	AI scaffolds cognitive planning and idea organization	Guide students to use AI for brainstorming, outlining, and structuring essays
Motivation & Confidence Building	Overall writing score improved (Pretest 65.65 → Posttest 73.67)	Students reported increased confidence and motivation (S05–S08)	AI fosters self-efficacy and task engagement	Incorporate AI-assisted exercises with encouragement and milestone feedback
Ethical Awareness	Ethical Awareness improved ($M = 3.70 \rightarrow 3.88$, $F = 5.68$, $p = .004$)	Students emphasized originality and proper attribution (S09–S11)	AI can reinforce academic integrity when guided	Include steps for citing AI contributions and monitoring originality
Digital Literacy	Normality confirmed; parametric tests valid	Students reported challenges interpreting AI suggestions (S12–S15)	Effective AI use requires digital literacy scaffolding	Train students to interpret AI outputs, troubleshoot suggestions, and apply AI responsibly

Continuous Perception Monitoring	Positive overall perceptions (Overall M = 3.93 → 4.12)	Students found AI useful, easy to use, and ethically manageable	Systematic AI integration enhances learning and ethical engagement	Monitor student perceptions, adjust guidance, and reinforce ethical and practical use of AI

Integrating these findings demonstrates that AI-assisted prewriting serves as both a cognitive and motivational scaffold. The quantitative gains in writing sub-dimensions align with qualitative reports of AI facilitating idea generation, organization, and logical coherence, consistent with previous research showing that AI supports planning and drafting in writing tasks (Li & Ni, 2022; Wang et al., 2021). The increase in Overall Writing Scores and student confidence reflects the motivational effects of AI feedback, which enhances self-efficacy in line with Bandura's (1997) framework. Ethical awareness improvements, as evidenced in both quantitative and qualitative findings, indicate that students learned to use AI responsibly, echoing Heaven (2023), who emphasizes the importance of integrating digital ethics into AI-mediated learning. Digital literacy challenges identified in qualitative data underscore the need for structured guidance, supporting Zawacki-Richter et al. (2019), who highlighted the necessity of scaffolding to prevent misinterpretation or misuse of AI suggestions. Positive perceptions of AI across phases suggest that consistent exposure to AI tools increases familiarity and ethical integration, supporting Li and Wang's (2022) findings that repeated interaction with AI enhances both practical and reflective engagement in learning.

CONCLUSION

The findings of this study demonstrate that AI-assisted (chat GPT) prewriting strategies significantly enhance the writing competence of ninety (90) undergraduate students in the Philippines. Quantitative results showed consistent and statistically significant improvements across all writing sub-dimensions Content Development, Coherence, Grammar, Creativity and overall writing scores, confirming the efficacy of AI tools in scaffolding cognitive processes involved in prewriting. Complementary qualitative findings revealed that students perceived AI as a valuable aid in organizing ideas, generating content, linking paragraphs, and overcoming writer's block, highlighting its role as both a cognitive and motivational support. Additionally, AI use contributed to increased self-efficacy, motivation, and task engagement, enabling students to approach writing with greater confidence and autonomy. Ethical awareness emerged as an important outcome, with students demonstrating attention to originality, proper attribution, and responsible AI use. This underscores the necessity of integrating digital ethics education alongside AI-assisted learning, ensuring that students not only benefit from technological support but also engage in reflective and responsible practices. Digital literacy challenges, such as interpreting AI suggestions and applying them effectively, indicate the need for structured guidance and training to maximize AI's pedagogical potential. In general context, the study suggests that systematic integration of AI-assisted prewriting in writing instruction fosters both cognitive skill development and ethical, responsible engagement with technology. Educators are encouraged to incorporate AI scaffolds for brainstorming, outlining, and idea organization, paired with guidance on ethical use and digital literacy. By doing so, AI can enhance students' writing competence, promote reflective and independent learning, and prepare learners for responsible participation in technology-mediated academic and professional environments.

Recommendations , Limitations and Future Research Direction

Based on the findings of this study, several practical and theoretical recommendations can be proposed. Practically, educators are encouraged to integrate AI-assisted prewriting strategies into writing instruction to enhance students' cognitive planning, idea generation, and organization. Structured activities such as guided brainstorming, outlining, and paragraph linking, paired with milestone feedback, can further reinforce writing competence, motivation, and self-efficacy. Teachers should also provide explicit instruction on ethical AI use, including proper attribution and originality checks, while scaffolding digital literacy skills to help students interpret AI suggestions critically and responsibly. Theoretically, this study supports the integration of process-oriented writing frameworks with digital tools, highlighting AI's role as a cognitive and motivational scaffold that aligns with self-efficacy theory and contemporary perspectives on technology-mediated learning. Despite these contributions, the study has limitations. The single-case design focused on one cohort of undergraduate students in English and communication programs at a state university, limiting the generalizability of findings to other disciplines, institutions, or cultural contexts. Additionally, qualitative data were drawn from a relatively small subset of participants, which may not capture the full range of experiences and challenges associated with AI use. Future research could address these limitations by employing larger, more diverse samples across multiple universities and disciplines, as well as longitudinal designs to examine long-term impacts of AI-assisted writing. Further studies could also explore comparative analyses of different AI tools aside form Chat GPT, investigate AI integration in collaborative writing contexts, and assess the effectiveness of tailored digital literacy and ethics training on students' responsible use of AI. Collectively, such investigations would expand theoretical understanding and provide actionable insights for sustainable, ethical, and effective integration of AI in higher education writing instruction.

Implications for Ethical AI Usage in Instruction

The study highlights the need for structured, ethical integration of AI tools like ChatGPT in writing instruction. Educators should guide students to use AI responsibly, emphasizing originality, proper attribution, and avoidance of plagiarism. Clear policies and instructions on acknowledging AI-generated contributions help maintain academic integrity while supporting cognitive scaffolding. Digital literacy scaffolding is critical. While AI aids in idea generation, organization, and grammar, students may misinterpret suggestions or over-rely on outputs. Teachers should train learners to critically evaluate AI recommendations, distinguish tool-generated content from personal ideas, and engage in reflective writing practices. Gradual, phased integration of AI supports both skill development and ethical awareness. Incorporating milestone feedback, ethical prompts, and discussions on AI biases fosters critical thinking and responsible use. Ethical AI integration promotes writing competence, self-regulated learning, and digital responsibility, preparing students for academic and professional contexts. Institutions should establish guidance frameworks that balance AI's benefits with ethical practices, ensuring technology serves as a scaffold, not a substitute, for cognitive effort. Through responsible, reflective use, AI can enhance learning outcomes while cultivating digitally literate and ethically aware learners. Schools shall promote the responsible and ethical use of AI tools, such as ChatGPT, in teaching and learning. AI should serve as a support for idea generation, organization, and revision, not as a replacement for student thinking. Students must acknowledge AI contributions and critically evaluate AI suggestions to avoid plagiarism or misuse. Teachers are responsible for guiding students in proper AI use, fostering digital literacy, and monitoring interactions with AI platforms. Training should be provided to ensure safe, ethical, and effective integration of AI in instruction. Violations of ethical AI use will follow the school's academic integrity policies. The policy will be regularly updated to keep pace with evolving AI technologies.

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