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AI utilization, writing anxiety, and quality of teachers' writing instruction as links to academic writing skills

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Abstract

Aim: This study examined whether writing anxiety, artificial intelligence (AI) utilization, and the quality of teachers' writing instruction significantly influence the academic writing skills of Grade 10 students, with implications for improving writing pedagogy and technology integration in secondary education.

Methodology: A descriptive-correlational research design was employed involving 311 Grade 10 students from a public comprehensive high school in Misamis Oriental. Stratified random sampling was utilized. Data were collected using validated questionnaires and a writing assessment rubric. Descriptive statistics and multiple regression analysis were applied at a 0.05 level of significance.

Results: The findings indicated that students demonstrated moderate levels of writing anxiety and AI utilization, alongside high levels of instructional quality and ethical AI use. Overall writing proficiency was at a developing level. Regression analysis revealed that AI utilization and the quality of teachers' writing instruction significantly predicted academic writing skills, whereas writing anxiety did not show a significant influence.

Conclusion: The study highlights that effective instructional practices and purposeful, ethical integration of AI play a more critical role in enhancing students' academic writing skills than affective factors alone. The findings underscore the importance of strengthening pedagogy, integrating technology responsibly, and designing instructional strategies that support both skill development and critical thinking in writing.

Keywords: *Academic writing skills, writing anxiety, artificial intelligence, writing instruction quality, technology-assisted learning*

INTRODUCTION

Academic writing is widely recognized as an essential competency that enables learners to communicate ideas clearly, demonstrate critical thinking, and succeed in academic and professional contexts. It requires competence in content development, organization, grammar, vocabulary, and mechanics, all of which contribute to clarity and coherence in written expression (Hyland, 2022). Despite its importance, many students continue to struggle with producing well-structured and meaningful academic texts, particularly at the secondary level.

Globally, recent educational developments emphasize the integration of digital technologies, particularly artificial intelligence (AI), in supporting writing instruction and learning processes. Tools such as ChatGPT and Grammarly provide immediate feedback on grammar, organization, and language use, which may enhance writing performance and learner engagement (Kasneci et al., 2023; Holmes et al., 2022). However, concerns persist regarding overreliance on AI, potential decline in critical thinking, and issues related to academic integrity (Cotton et al., 2023; Zhai, 2022). In addition to technological factors, affective variables such as writing anxiety significantly influence students' writing performance, as fear, tension, and negative anticipation may interfere with idea generation and organization (Wahyuni & Umam, 2022; Zhang, 2021).

At the same time, the quality of teachers' writing instruction remains a critical determinant of students' writing development. Effective instruction, including clear explanations, structured guidance, and meaningful feedback, plays

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a vital role in improving learners' academic writing skills (Graham et al., 2021; Lee, 2021). Teachers also serve as facilitators in guiding students toward the responsible and purposeful use of AI tools within academic contexts.

Despite these global trends, much of the existing research has focused on higher education settings or technologically advanced environments, with limited attention given to secondary-level learners in developing countries. In the Philippine public school context, particularly in regions such as Misamis Oriental, students experience varied levels of access to technology, instructional support, and learning resources, which may influence their writing outcomes. In the Philippines, the Department of Education (DepEd) continues to emphasize the development of literacy and academic writing skills as part of the MATATAG curriculum reforms and 21st-century educational reports continue to indicate challenges in students' writing proficiency, critical thinking, and language performance, particularly in public secondary schools where access to instructional resources and digital technologies varies significantly (Department of Education, 2023; SEAMEO INNOTECH, 2022). These challenges became more evident following the increased integration of digital learning tools after the pandemic, highlighting the need for effective writing instruction and responsible technology integration in classroom learning context. Moreover, few studies have examined writing anxiety, AI utilization, and teachers' writing instruction within a single integrated framework, highlighting a significant gap in current educational research.

This study demonstrates significant academic and practical value in education by advancing understanding of academic writing development through an integrated examination of writing anxiety, artificial intelligence (AI) utilization, and the quality of teachers' writing instruction. Addressing a critical gap in literature focused largely on higher education and technologically advanced contexts, it provides context-specific evidence from Philippine public secondary schools, particularly in Misamis Oriental. By situating the study within a developing country context, it contributes to more inclusive research and highlights that writing proficiency is shaped by instructional practices, emotional readiness, and responsible technology use (Hyland, 2022; Kasneci et al., 2023; Teng & Zhang, 2020).

Furthermore, the study contributes to curriculum development, assessment practices, and teacher professional development by emphasizing process-oriented instruction, scaffolded learning, and ethical AI integration (Graham et al., 2021; Holmes et al., 2022; Cotton et al., 2023). It underscores the importance of formative feedback and continuous writing development while reaffirming the central role of teachers in fostering higher-order thinking despite the use of AI tools (Hyland & Hyland, 2020; Lee, 2021). As a pedagogical innovation, it advances a balanced framework for AI use, positioning technology as a support for writing while preserving critical thinking and originality, thereby informing instructional design, policy, and classroom practice in the digital age (Zhai, 2022).

Therefore, this study aims to address this gap by examining the combined influence of writing anxiety, AI utilization, and the quality of teachers' writing instruction on students' academic writing skills. Unlike previous studies that investigate these variables independently, the present research adopts a comprehensive and context-specific approach aligned with actual classroom conditions in Philippine public secondary schools. Through this approach, the study contributes to improving writing pedagogy, promoting responsible AI integration, and providing evidence-based insights for enhancing teaching and learning practices.

Review of Related Literature and Studies

Academic Writing Skills

Academic writing is a foundational competency that enables learners to construct arguments, organize ideas, and communicate knowledge effectively across academic contexts (Hyland, 2022; Teng & Zhang, 2021). Recent studies emphasize that writing development is a recursive and cognitively demanding process supported by explicit instruction, scaffolding, and continuous feedback (Ihsan & Musdizal, 2025; Benmaamar & Benmostefa, 2025). Despite these advances, persistent difficulties in grammar, coherence, and idea development continue to affect learners' writing performance, particularly in secondary education (Arsate et al., 2025; Roy Jr., 2025).

Current literature highlights the need for integrated approaches that combine linguistic, cognitive, and technological support to improve writing outcomes. Technology-enhanced tools and scaffolded pedagogies have been shown to facilitate revision, increase learner autonomy, and strengthen writing proficiency (Lee, 2025; Khanduri & Teotia, 2023). However, the continued presence of writing challenges suggests that instructional approaches must simultaneously address both higher-order thinking and foundational language skills.

Writing Anxiety

Writing anxiety is widely recognized as a key affective factor that negatively influences learners' writing performance by limiting idea generation, organization, and engagement in writing tasks (Wahyuni & Umam, 2022; Zhang, 2021). Recent research conceptualizes writing anxiety as a multidimensional construct involving cognitive,

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somatic, and avoidance responses that interfere with effective writing processes (Ruslan et al., 2025; Patty, 2025). These emotional barriers often result in reduced confidence and lower-quality writing outputs.

Studies further indicate that writing anxiety can be alleviated through structured instructional support, constructive feedback, and the development of writing self-efficacy. The use of pre-writing strategies and digital tools has also been shown to reduce cognitive load and help learners manage writing-related stress more effectively (Tabari & Goetze, 2024). Nevertheless, writing anxiety remains prevalent, highlighting the need for pedagogical approaches that address both emotional and cognitive dimensions of writing.

Use of AI Tools In Writing

The integration of artificial intelligence in education has significantly influenced writing practices by providing real-time feedback, automated corrections, and support for idea generation (Kasneci et al., 2023; Holmes et al., 2022). These developments reflect the growing role of technology in enhancing student learning and engagement.

However, literature also underscores critical concerns related to overreliance on AI, academic integrity, and the potential decline in higher-order thinking skills. Scholars emphasize the importance of ethical and responsible AI use, supported by clear institutional guidelines and digital literacy development (Cotton et al., 2023; Zhai, 2022). Thus, the effectiveness of AI integration depends on how learners critically and purposefully engage with these tools.

Quality of Teachers' Writing Instruction

The quality of teachers' writing instruction remains a central factor in students' writing development, particularly through effective pedagogy, content knowledge, and feedback practices (Graham et al., 2021; Lee, 2021). Teachers play a crucial role in guiding learners through complex writing processes and supporting skill development.

Recent studies also highlight the need for instructional practices that align with technological advancements and diverse learner needs. However, systemic challenges such as limited resources and varying instructional capacities continue to affect teaching effectiveness in many contexts.

Philippine educational reforms likewise recognize the growing importance of technology integration and digital literacy in improving learning outcomes. The MATATAG Curriculum emphasized foundational literacy, critical thinking, and technology-supported instruction as essential competencies for Filipino learners. However, studies and regional educational reports continue to highlight disparities in technological access and instructional readiness among public schools, particularly in developing and rural educational contexts. These conditions reinforce the importance of examining AI utilization and instructional quality within Philippine secondary education.

Synthesis and Research Gap

The reviewed literature indicates that academic writing development is shaped by a complex interplay of cognitive, affective, technological, and instructional factors, with evidence highlighting the roles of writing anxiety, AI utilization, and the quality of teachers' writing instruction in influencing learners' performance (Hyland, 2022; Kasneci et al., 2023; Graham et al., 2021). While recent studies have examined these variables independently, there remains limited empirical research that integrates them within a single analytical framework, particularly in secondary education and developing country contexts such as Philippine public schools. This gap underscores the need for context-specific and comprehensive investigations, thereby justifying the present study, which examines the combined influence of writing anxiety, AI utilization, and instructional quality on academic writing skills to provide more holistic and pedagogically relevant insights.

Theoretical Framework

This study was anchored on several interrelated theories, namely the Cognitive Process Theory of Writing, Affective Filter Hypothesis, Sociocultural Theory of Learning, Technology Acceptance Model, and Cognitive Load Theory (Flower & Hayes, 1981; Krashen, 1982; Vygotsky, 1978; Davis, 1989; Sweller, 1988). Collectively, these theories explain how cognitive, emotional, instructional, and technological factors influence students' academic writing skills.

The Cognitive Process Theory views writing as a recursive process involving planning, translating, and reviewing, while the Affective Filter Hypothesis explains how emotional factors such as anxiety may hinder language production and writing performance. The Sociocultural Theory emphasizes the importance of scaffolding, interaction, and guided support in learning, particularly through teacher feedback and instructional practices. Meanwhile, the Technology Acceptance Model explains learners' engagement with AI tools based on perceived usefulness and ease of use, whereas Cognitive Load Theory highlights how instructional and technological supports may reduce cognitive burden during writing tasks.

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These theories collectively explain the relationships among writing anxiety, AI utilization, and quality of teachers' writing instruction in shaping students' academic writing skills. Writing anxiety may interfere with cognitive processing and writing performance, while AI tools and effective instruction may support idea generation, organization, revision, and language development. Guided by these perspectives, the study examined how affective, technological, and instructional factors interact in influencing academic writing proficiency.

The conceptual framework illustrates writing anxiety, AI utilization, and quality of teachers' writing instruction as the independent variables influencing academic writing skills. Writing anxiety includes negative anticipation and task processing difficulties, which may affect students' confidence and engagement in writing tasks. AI utilization is examined in terms of frequency of use, purpose, variety of platforms, and responsible and ethical use, reflecting how technology may support writing development when used appropriately. The quality of teachers' writing instruction is viewed through content knowledge, pedagogical skills, and feedback and assessment practices, which provide scaffolding that facilitates students' writing improvement.

Collectively, these variables are hypothesized to significantly influence students' academic writing skills, particularly in idea development, organization, grammar, language use, and mechanics.

Conceptual Framework

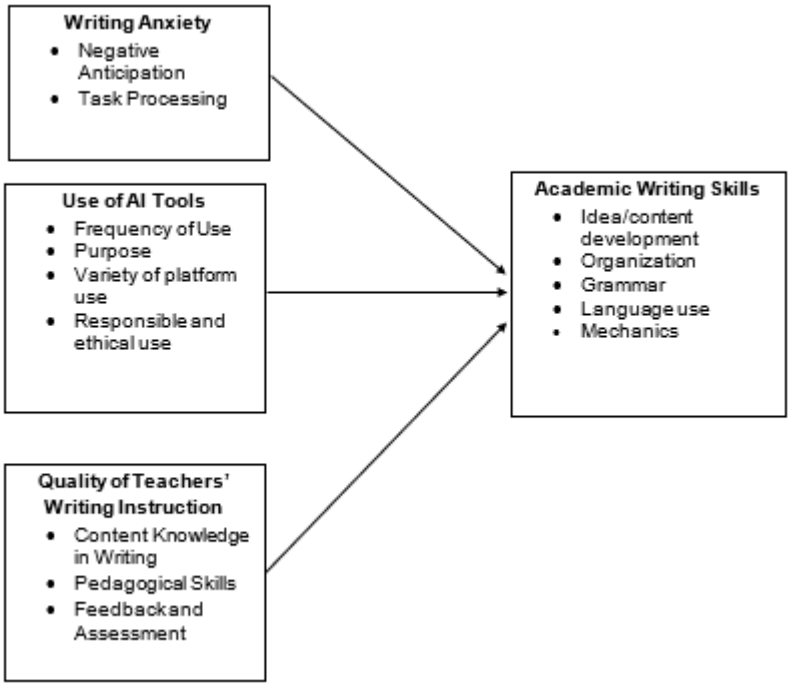

Figure 1. Research Paradigm

Statement of the Problem

Academic writing remains a persistent challenge among secondary-level learners, particularly in developing educational contexts where variations in instructional quality, access to technological resources, and learner readiness influence writing outcomes. Despite the recognized importance of writing as a critical academic skill, many students continue to experience difficulties in organizing ideas, applying appropriate language structures, and producing coherent written outputs. These challenges are further compounded by affective factors such as writing anxiety and emerging technological influences such as artificial intelligence (AI) tools, which may either support or hinder writing development depending on their use.

While existing studies have examined writing anxiety, AI utilization, and instructional quality as separate factors, there remains limited empirical evidence on their combined influence on academic writing skills, particularly in secondary education within developing country contexts such as the Philippines. Moreover, there is insufficient

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understanding of how these variables interact across specific dimensions of writing proficiency, including idea development, organization, grammar, language use, and mechanics.

Given these gaps, there is a need to investigate how writing anxiety, AI utilization, and the quality of teachers' writing instruction collectively influence students' academic writing skills. Addressing this problem will provide a more comprehensive understanding of writing development and inform context-responsive instructional practices in secondary education.

Research Objectives

General Objective

To determine the influence of writing anxiety, AI utilization, and the quality of teachers' writing instruction on the academic writing skills of Grade 10 students.

Specific Objectives

The study aims to:

1. determine the level of students' writing anxiety in terms of:
   1.1 Negative anticipation
   1.2 Task processing difficulties
2. assess the extent of students' AI utilization in terms of:
   2.1 Frequency of use
   2.2 Purpose
   2.3 Variety of platform use
3. evaluate the level of students' perceived quality of teachers' writing instruction in terms of:
   3.1 Content knowledge
   3.2 Pedagogical skills
   3.3 Feedback and assessment
4. determine the level of students' academic writing skills in terms of:
   4.1 Idea/content development
   4.2 Organization
   4.3 Grammar
   4.4 Language use
   4.5 Mechanics
5. analyze the significant predictive influence of writing anxiety, AI utilization, and the quality of teachers' writing instruction on students' academic writing skills.

Research Questions

1. What is the level of students' writing anxiety in terms of:
   1.1 Negative anticipation; and
   1.2 Task processing difficulties?
2. What is the extent of students' AI utilization in terms of:
   2.1 Frequency of use;
   2.2 Purpose; and
   2.3 Variety of platform use?
3. What is the level of students' perceived quality of teachers' writing instruction in terms of:
   3.1 Content knowledge;
   3.2 Pedagogical skills; and
   3.3 Feedback and assessment?
4. What is the level of students' academic writing skills in terms of:
   4.1 Idea/content development;
   4.2 Organization;
   4.3 Grammar;
   4.4 Language use; and
   4.5 Mechanics?

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5. Do writing anxiety, AI utilization, and the quality of teachers' writing instruction significantly predict students' academic writing skills?

Hypotheses

H_{01}: Writing anxiety does not significantly influence students' academic writing skills.
H_{02}: AI utilization does not significantly influence students' academic writing skills.
H_{03}: The quality of teachers' writing instruction does not significantly influence students' academic writing skills.
H_{04}: Writing anxiety, AI utilization, and the quality of teachers' writing instruction do not significantly predict students' academic writing skills when taken collectively.

METHODOLOGY

Research Design

This study employed a quantitative non-experimental descriptive-correlational research design to examine the relationships among writing anxiety, artificial intelligence (AI) utilization, the quality of teachers' writing instruction, and students' academic writing skills. The descriptive component determined the levels of the identified variables, while the correlational aspect examined their associations and predictive influence without manipulating any variables. As a non-experimental study, the research observed naturally occurring conditions in the educational settings, allowing the variables to be examined as they existed within actual classroom contexts.

The study did not involve any treatment, intervention, or experimental manipulation of participants or variables. Instead, it focused on identifying patterns of relationships and determining whether writing anxiety, AI utilization, and instructional quality significantly influenced students' academic writing skills. The design was considered appropriate because it enabled the researcher to investigate educational phenomena objectively while preserving the natural learning environment of the participants.

The design was implemented through the collection of quantitative data using structured survey questionnaires and a writing assessment rubric administered to Grade 10 students. Descriptive statistics were used to summarize the levels of the variables, while multiple regression analysis was employed to determine the predictive influence of the independent variables on academic writing performance. This approach ensured objectivity, statistical reliability, and meaningful interpretation of how cognitive, affective, technological, and instructional factors interact in shaping students' writing skills.

Population and Sampling

The study involved a total of 311 Grade 10 students enrolled in a public secondary school under the Department of Education (DepEd) in Misamis Oriental, Philippines. This sample was drawn from a population of approximately 1,400 learners, and the required sample size was determined using the Taro Yamane formula with a 0.05 margin of error to ensure adequate representation and statistical reliability. The selected sample size provided a balance between feasibility and accuracy, allowing the study to generate meaningful and generalizable findings within the defined population.

A stratified random sampling technique was employed to ensure proportional representation across all regular Grade 10 sections. The population was first divided into strata based on class sections, and the number of participants selected from each section was computed proportionally relative to its population size. Participants were then randomly selected using a lottery method or random number generator, ensuring that each student had an equal chance of inclusion while excluding those enrolled in special programs to maintain sample homogeneity and reduce potential bias.

The study included only students enrolled in regular Grade 10 classes and excluded learners from Special Program sections such as Science, Special Program in the Arts (SPA), Special Program in Sports (SPS), and Journalism programs. These special programs were excluded because they follow specialized curricula, receive differentiated instructional approaches, and involve distinct academic training and performance expectations that may significantly differ from those of regular classes. Limiting the participants to regular sections helped maintain greater consistency in instructional context and ensured a more homogeneous sample for analyzing the relationships among writing anxiety, AI utilization, instructional quality, and academic writing skills.

Research Instruments

The study utilized structured and validated research instruments to gather data on writing anxiety, AI utilization, quality of teachers' writing instruction, and students' academic writing skills. The instruments were selected and adapted from established studies and theoretical constructs to ensure content relevance, construct validity, and

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alignment with the objectives of the study. The writing anxiety scale was measured using an adapted survey questionnaire based on the Second Language Writing Anxiety Inventory (SLWAI) developed by Cheng (2004). The instrument addressed students' level of writing anxiety in terms of negative anticipation and task processing difficulties, while the AI utilization was measured using a researcher-adapted questionnaire developed from recent literature on AI use in education and technology-assisted learning (Holmes et al., 2022). The instrument examined students' AI utilization in terms of frequency of use, purpose, variety of platform, and responsible and ethical use of AI tools. The perceived writing instructional quality of teachers was assessed using an adapted instructional quality survey anchored on the frameworks of effective writing pedagogy discussed by Graham et al. (2021) and Lee (2021). The instruments evaluated instructional quality in terms of content knowledge, pedagogical skills, and feedback and assessment practices. Students' academic writing skills were assessed using an analytic writing rubric adapted from established academic writing assessment frameworks commonly used in English language instruction. The rubric evaluated students' writing proficiency in terms of idea/content development, organization, grammar, language use, and mechanics. All instruments underwent content validation by experts in education and research with backgrounds in English language teaching and quantitative research, and were pilot-tested to ensure clarity, reliability, and alignment with the study variables.

Content Validation

The research instruments underwent a rigorous content validation process to ensure their relevance, clarity, and alignment with the objectives of the study. A panel of three to five experts in the fields of English education, applied linguistics, and educational research, each with advanced degrees and experience in teaching, assessment, and quantitative research, evaluated the questionnaire and writing rubric. The validators examined each item in terms of clarity, appropriateness, and representativeness of the constructs, and their feedback led to the refinement, revision, and improvement of the instruments to ensure content validity and suitability for the target participants.

Reliability Testing

The reliability of the research instruments was established through a pilot test conducted among a group of students with characteristics similar to the study participants. The collected data were analyzed using Cronbach's Alpha to determine the internal consistency of the questionnaire, with coefficients of 0.70 and above indicating acceptable reliability. The results showed that all subscales met the required reliability threshold, confirming that the instruments were consistent, stable, and suitable for measuring writing anxiety, AI utilization, and the quality of teachers' writing instruction.

Data Collection Procedure

Prior to data collection, the researcher secured the necessary approvals from the Department of Education (DepEd), school administration, and other appropriate authorities, while ensuring compliance with ethical standards such as informed consent, confidentiality, and voluntary participation. Data collection was conducted over approximately four weeks during the second semester of School Year 2025-2026, specifically from January to February 2026. The survey questionnaires and writing assessment were administered in a supervised and standardized manner across all selected Grade 10 sections to ensure consistency in instructions, procedures, and time allotment. After retrieval, all responses were checked, encoded, and statistically analyzed using appropriate descriptive and inferential statistical tools.

Treatment of Data

The collected data were systematically encoded, organized, using SPSS version 26 and inferential statistical techniques to address the objectives of the study. Descriptive statistics, specifically the mean and standard deviation, were used to determine the levels of writing anxiety, AI utilization, quality of teachers' writing instruction, and academic writing skills, with results interpreted using an established scale. For inferential analysis, multiple regression analysis was employed to examine the predictive influence of writing anxiety, AI utilization, and instructional quality on students' academic writing performance, using a 0.05 level of significance. The interpretation of the Likert-scale responses was based on the adapted five-point scale commonly used in educational and behavioral research studies, where numerical ranges corresponded to qualitative descriptions such as Very Low, Low, Moderate, High, and Very High. Before conducting the regression analysis, the necessary statistical assumptions, including normality and multicollinearity, were assessed to ensure the validity of the model. The results were interpreted based on computed coefficients, significance values (p-values), and the overall model fit. This analytical procedure allowed for a comprehensive examination of how the independent variables collectively and individually influenced academic writing skills.

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Table 1

Scoring Interpretation for AI Utilization, Writing Anxiety, and Quality of Teachers' Writing Instruction

Range	Description	Interpretation
4.51 – 5.00	Always	Very High
3.51 – 4.50	Often	High
2.51 – 3.50	Sometimes	Moderate
1.51 – 2.50	Rarely	Low
1.00 – 1.50	Never	Very Low

Table 2

Scoring Interpretation for Writing Skills

Range	Interpretation
4.51 – 5.00	Outstanding
3.51 – 4.50	Very Good
2.51 – 3.50	Good
1.51 – 2.50	Fair
1.00 – 1.50	Poor

Ethical Considerations

The study adhered to established ethical standards by obtaining approval from the Lourdes College Research Ethics Committee (LCREC) as well as from the Department of Education (DepEd), securing formal permissions from the school administration and relevant educational authorities before data collection where the study was conducted. Informed consent was obtained from all participants, who were clearly informed about the purpose, procedures, voluntary nature of the study, and their right to withdraw at any time without penalty. Confidentiality and anonymity were strictly maintained, with no personal identifiers collected, and all data were used solely for academic purposes to protect the privacy and rights of the participants.

RESULTS and DISCUSSION

This section presents and discusses the results of the study based on the research questions. Findings are interpreted in relation to learning theory and relevant empirical studies to explain observed outcomes.

Table 3 presents the participants' level of writing anxiety across the identified dimensions. The overall mean of 3.49, interpreted as Moderate, indicates that writing anxiety was present but remained within a manageable range, suggesting that learners experience occasional worry or pressure without it dominating their writing performance. This implies that students were able to engage in writing tasks while navigating typical academic demands, highlighting the need for supportive instructional environments that balanced challenge with guidance.

Table 3

Summary Table of Writing Anxiety

Writing Anxiety	Mean	Interpretation	SD
Negative Anticipation	3.48	Moderate	0.70
Task Processing	3.50	Moderate	0.65
Overall	3.49	Moderate	0.62

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Across dimensions, task processing (M = 3.50) obtained the highest mean, followed closely by negative anticipation (M = 3.48), both interpreted as Moderate. The minimal difference between these values suggested that cognitive demands and evaluation-related concerns contribute almost equally to students' writing experiences. This pattern reflected common academic pressures associated with planning, drafting, and meeting expectations, consistent with literature indicating that moderate anxiety is typical in structured learning environments (Bean & Melzer, 2021).

The Moderate levels across dimensions indicated that students experience manageable levels of uncertainty, time pressure, and evaluative awareness during writing tasks. From a cognitive perspective, writing involves planning, translating, and reviewing processes that inherently require mental effort (Flower & Hayes, 1981), which may explain the presence of moderate anxiety. Overall, the findings suggested that writing anxiety functions as a normal academic condition rather than a barrier, emphasizing the role of structured instruction and guided practice in supporting learners' writing development.

Table 4 provides a summary of the participants' AI utilization across dimensions. The computed mean of *3.40*, interpreted as *Moderate*, may indicate that students integrated AI into their academic routines in a balanced and purposeful manner. A *Moderate* level may mean that learners used AI tools when needed but did not rely on them excessively. This may imply that AI functions as a supportive academic resource rather than a dominant learning strategy, which reflects existing scholarship emphasizing that ethical awareness remains a foundational condition for effective AI integration (Weiner, 2025).

Table 4
Summary Table of the Participants' AI Utilization

AI Utilization	Mean	Interpretation	SD
Frequency of Use	3.03	Sometimes	0.52
Purpose	3.44	Sometimes	0.62
Variety of Platform Use	3.38	Sometimes	0.55
Responsible and Ethical Use	3.75	Often	0.60
Overall	3.40	Sometimes	0.44

Examining the general trend across dimensions, responsible and ethical use (*M = 3.75*, *High*) obtained the highest value, while frequency of use (*M = 3.03*, *Moderate*), purpose (*M = 3.44*, *Moderate*), and variety of platform use (*M = 3.38*, *Moderate*) remained within the same interpretation level. This pattern may indicate that although students engage with AI at a moderate level, they demonstrate stronger awareness of ethical practices. Such a pattern may suggest that learners use AI tools selectively during writing tasks, indicating that these tools are utilized as supplementary resources within their academic work.

Table 5 presents the overall quality of teachers' writing instruction with a mean of 3.97, interpreted as High. This indicated that students generally perceive writing instruction as strong in terms of content knowledge, pedagogical practices, and feedback processes. The results suggested that learners consistently experience structured teaching, clear explanations, and supportive assessment that facilitate writing development.

Across the dimensions, content knowledge obtained the highest mean (M = 4.01), followed closely by pedagogical skills (M = 3.95) and feedback and assessment (M = 3.95), all interpreted as High. The close values indicated consistency in instructional quality, reflecting a balanced and integrated teaching approach.

Table 5
Summary Table of Quality of Teachers' Writing Instruction

Quality of Teachers' Writing Instruction	Mean	Interpretation	SD
Content Knowledge in Writing	4.01	High	0.63
Pedagogical Skills	3.95	High	0.60
Feedback and Assessment	3.95	High	0.58
Overall	3.97	High	0.55

The high ratings in pedagogical skills and feedback suggested that teachers employed structured strategies and provide meaningful, process-oriented evaluation. Scaffolded instruction and constructive feedback enable learners to organize ideas, refine drafts, and improve writing performance (Ikawati, 2020; Song & Song, 2023). Overall, the findings highlight the importance of combining expertise, effective teaching strategies, and feedback to support sustained writing development.

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Table 6

Summary Table of the Participants' Writing Proficiency

Writing Proficiency	Mean	Interpretation	SD
Idea/Content Development	2.02	Fair	0.73
Organization	1.84	Fair	0.64
Grammar	1.91	Fair	0.70
Language Use	1.82	Fair	0.64
Mechanics	1.61	Fair	0.60
Overall	1.84	Fair	0.61

Table 6 presents the participants' overall writing proficiency with a mean of 1.84, interpreted as Fair. This suggested that many students still experienced difficulty in developing ideas, organizing content, and applying grammar and mechanics consistently. Among the dimensions, mechanics (M = 1.61) appeared to be the weakest area, indicating the need for additional support in punctuation, spelling, and formatting.

Across dimensions, all components—including idea development (M = 2.02), organization (M = 1.84), grammar (M = 1.91), language use (M = 1.82), and mechanics (M = 1.61)—fall within the Fair level. This pattern indicated that writing challenges were not isolated but occured across multiple aspects of writing, reflecting its integrated nature. It also suggested a gap between perceived instructional quality and actual writing performance, as learners may still be developing the ability to apply skills independently (Teng & Zhang, 2020).

The overall writing proficiency of students at a Fair level indicates that learners are still in the developmental stage of mastering both foundational and higher-order writing skills. This finding suggests a critical gap between instructional delivery and independent skill application, highlighting the need for more sustained, practice-oriented writing instruction. From a pedagogical perspective, this underscores the importance of integrating process-based writing approaches within the curriculum, where drafting, feedback, and revision are systematically embedded in classroom instruction. For teachers, the results emphasize the need to intensify guided writing exercises and differentiated feedback strategies, while for curriculum developers, the findings suggest revisiting writing competencies to ensure alignment between instructional expectations and learner capabilities (Teng & Zhang, 2020; Teng & Teng, 2024; Roothooft et al., 2025). At the institutional level, school leaders may consider strengthening writing support programs and teacher training initiatives that focus on effective writing pedagogy and assessment practices.

Table 7 presents the results of the multiple regression analysis examining the influence of writing anxiety, AI utilization, and quality of writing instruction on writing proficiency. The model was statistically significant, $F(3, 307) = 6.16$, $p < .001$, with $R^2 = 0.057$, indicating that 5.7% of the variance in writing proficiency was explained by the predictors. This relatively low explained variance suggested that writing proficiency was influenced by multiple factors beyond those included in the model, highlighting its complex and multifaceted nature (Dong, 2024).

Among the predictors, AI utilization emerged as a significant factor ($B = 0.25$, $p = 0.003$), indicating that increased use of AI tools was associated with improved writing proficiency. Similarly, the perceived quality of writing instruction ($B = 0.14$, $p = 0.032$) showed a significant positive influence, suggesting that structured teaching practices support writing development. These findings confirm the rejection of the null hypothesis and align with studies emphasizing the role of AI and instructional support in enhancing writing skills (Escalante et al., 2023; Sins, 2024).

In contrast, writing anxiety ($B = -0.06$, $p = 0.306$) did not significantly predict writing proficiency, indicating no direct relationship with performance outcomes. This may be due to the moderate level of anxiety observed, which suggested that it functioned as a manageable condition rather than a major barrier. Overall, the findings indicated that while AI utilization and instructional quality positively influence writing development, writing proficiency is shaped by a broader set of cognitive, instructional, and contextual factors (Cao & Yu, 2023).

Table 7

Regression Analysis of the Participants' Writing Anxiety, AI Utilization, and Quality of Writing Instruction on Writing Proficiency

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		

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Constant	0.65	0.35		-0.04	1.34	1.85	0.066
Writing Anxiety	-0.06	0.06	-0.058	-0.17	0.05	-1.02	0.306
AI Utilization	0.25	0.08	0.176	0.08	0.41	3.00**	0.003
Quality of Writing Instruction	0.14	0.06	0.124	0.01	0.27	2.15	0.032

Model Summary

$R = 0.238$ $R^2 = 0.057$ Adjusted $R^2 = 0.048$ $F(3,307) = 6.16^*$ $p<.001$

Note. B = unstandardized beta coefficient, SE = standard error, β = standardized beta coefficient, 95% CI = 95% confidence interval, t = t statistic, p = probability value. *Significant at 0.05 two-tailed alpha level. **Significant at 0.01 level

Model Equation: P = 0.25U + 0.14Q
Legend: P = Writing Proficiency, U = AI Utilization, Q = Quality of Writing Instruction

Conclusions

Based on the findings of the study, several conclusions are drawn.

First, students experience moderate levels of writing anxiety alongside high levels of AI utilization and instructional quality, indicating that academic writing development is shaped by a combination of emotional, technological, and instructional factors within the learning environment.

Second, students' writing proficiency remains at a developing level, suggesting that while instructional support is present, learners require more sustained opportunities to apply writing skills independently.

Third, AI utilization and the quality of teachers' writing instruction significantly influence academic writing skills, highlighting the critical role of technology integration and effective pedagogy in enhancing writing performance. This underscores the importance of designing instruction that leverages AI as a support tool while maintaining focus on critical thinking and originality. Fourth, writing anxiety does not significantly predict writing performance, indicating that affective factors alone may not directly determine writing outcomes when instructional and technological supports are present.

Overall, the study contributes to educational research by demonstrating that academic writing development is best understood through an integrated framework that combines cognitive, instructional, and technological dimensions. The findings provide valuable insights for improving teaching practices, informing curriculum design, and strengthening teacher professional development programs focused on writing instruction and responsible AI integration.

Recommendations

Based on the conclusions of the study, the following recommendations are offered.

1. Students may enhance their academic writing skills by engaging in sustained writing practices such as structured outlining, drafting, and revision activities, while using AI tools responsibly for support in idea generation and language refinement without compromising independent thinking.
2. English teachers may strengthen writing instruction by implementing process-oriented pedagogies that integrate scaffolded learning, iterative feedback, and guided revision. They may also incorporate ethical AI-assisted strategies that support learning while maintaining academic integrity and critical thinking.
3. School administrators may support writing development by implementing professional development programs that focus on effective writing pedagogy, assessment practices, and responsible AI integration. They may also promote school-wide writing initiatives and allocate time for extended writing activities across subject areas.
4. Curriculum developers may revisit writing competencies and learning standards to ensure alignment between instructional practices, assessment methods, and students' developmental writing needs. They may also integrate technology-enhanced writing approaches that balance skill development and ethical AI use.
5. Teacher education institutions may incorporate training on AI-assisted instruction, writing pedagogy, and formative assessment strategies to prepare future educators for technology-integrated learning environments.
6. Future researchers may explore additional variables such as learner motivation, reading engagement, and language exposure, and may employ longitudinal or experimental designs to further examine the long-term effects of AI integration and instructional interventions on writing development.

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