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ChatGPT Overreliance, Writing Skill Development, and Academic Integrity: Evidence from Senior High School Learners

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Abstract

This study examined the effects of ChatGPT overreliance on the writing skills and ethical perceptions of senior high school learners at Sta. Lucia National High School Dolores Quezon amid the growing integration of AI tools specifically ChatGPT in academic writing. Using a mixed-methods design, the research employed a descriptive survey (n = 102), three writing performance tasks analyzed through one-way MANOVA, and five paired t-tests assessing changes following an AI Awareness Intervention, supplemented by thematic analysis of student and teacher interviews. Quantitative results showed significant differences across high-, moderate-, and low-reliance groups in key writing competencies, including reading-to-writing transfer, thesis development, and argumentation, while the intervention produced significant improvements in ethical awareness and responsible use. Qualitative findings revealed that students use ChatGPT for convenience, stress reduction, and language support, but excessive reliance reduced cognitive engagement, limited idea generation, and raised concerns about plagiarism and authorship. Overall, the study found that although ChatGPT can scaffold writing processes, overreliance undermines deeper learning and academic integrity, whereas structured AI literacy interventions effectively strengthen ethical judgment and self-regulation. These results highlight the need for institutional policies and pedagogical frameworks that promote responsible and educationally meaningful integration of AI in writing instruction.

Keywords: *ChatGPT overreliance, writing skills development, ethical academic practices, ethical AI use, MANOVA, Senior High School, digital literacy*

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I. INTRODUCTION

Artificial intelligence (AI) has rapidly reshaped global educational practices, especially with the emergence of large language models (LLMs) such as ChatGPT. These systems offer instant access to information, automated text generation, and personalized academic support, fundamentally altering how learners interact with knowledge (Bozkurt et al., 2023; Sun, 2023). While AI-assisted tools improve efficiency and expand opportunities for self-directed learning, scholars increasingly warn that uncritical dependence on generative AI may undermine essential cognitive processes, including comprehension, analytical reasoning, and authentic writing development (Li et al., 2023; Shidiq, 2023). As educational institutions worldwide confront the dual promise and peril of AI, the need to investigate how students internalize, utilize, and rely on these technologies has become a pressing academic and policy concern.

In the Philippines, the Department of Education (DepEd) continues to integrate digital technologies into basic education as part of broader goals to modernize instruction and enhance 21st-century skills. However, varying levels of digital infrastructure, teacher preparedness, and learner access create uneven adoption conditions, especially in rural public schools. Despite DepEd's push for ICT-enabled learning, the sudden proliferation of generative AI tools has outpaced national policy, leaving schools to navigate issues of academic integrity, responsible use, and AI literacy without comprehensive guidelines (Wang et al., 2023; Kooli, 2023). Senior high school students, particularly those enrolled in writing-intensive subjects such as Reading and Writing, English for Academic and Professional Purposes, Creative Nonfiction, and Practical Research, appear most affected by these shifts. As learners increasingly use ChatGPT to generate explanations, summaries, and written outputs, concerns arise regarding its long-term influence on foundational writing competencies required by the K–12 curriculum, including idea organization, coherence, source-based writing, and argumentative reasoning (Poláková, 2024; Khampusaen, 2024). These issues are especially pronounced in rural public schools such as Sta. Lucia National High School (SLNHS), where academic support systems remain limited.

Recent literature presents mixed findings on ChatGPT's academic value. Several studies show that conversational AI can enhance creativity, facilitate academic drafting, and improve writing efficiency when used as a scaffold rather than a substitute for cognitive effort (Naveed et al., 2023; Liberber et al., 2023). AI-supported learning environments also demonstrate improved learner engagement, reduced barriers to information access, and increased opportunities for individualized feedback (Gonzales & Vera, 2024; Hwang et al., 2020). However, other research emphasizes the risks posed by AI's hallucinations, surface-level coherence, and potential to bypass essential steps in reading-to-writing transfer, argument construction, and deep comprehension (Mahapatra, 2024; Malik, 2024). Scholars further highlight that reliance on AI may impede the development of metacognitive strategies required for planning, evaluating, and revising written work, core skills embedded in secondary writing curricula (Deng, 2024; Sherma, 2024). Furthermore, ethical concerns related to plagiarism, improper attribution, and diminished student accountability underscore the need for empirical evidence on how AI use intersects with academic integrity in secondary education (Yan, 2023; Shidiq, 2023).

Despite the growing body of work on ChatGPT in education, significant research gaps remain. First, existing studies rarely disaggregate writing skills into specific subcomponents such as idea organization, reading-to-writing transfer, and thesis development with argumentation, skills essential to academic literacy in senior high school programs (Poláková, 2024; Khampusaen, 2024). Second, limited empirical research exists on rural Philippine contexts, where technological disparities, pedagogical practices, and learner behavior may shape AI adoption in distinct ways (Fabro et al., 2024). Third, most studies examine AI use as either beneficial or harmful, without sufficiently analyzing the threshold at

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which use becomes overreliance and how this transition affects writing competence and ethical judgment. Finally, academic integrity research often focuses on higher education, leaving a gap in understanding how adolescents conceptualize ethical AI use and how overreliance may shape attitudes toward plagiarism and authorship (Naveed et al., 2023). Addressing these gaps, this study investigates how overreliance on ChatGPT influences senior high school learners' development of key writing skills and their perceptions of ethical and responsible AI use. By focusing on the specific experiences of students at SLNHS, the research provides context-sensitive evidence that can inform policies, teaching strategies, and AI literacy programs, ensuring that technological innovation complements rather than compromises foundational writing development.

Statement of the Problem

The widespread adoption of ChatGPT among senior high school learners has reshaped how students access information and complete writing tasks, raising concerns about its impact on fundamental writing skills and ethical academic behavior. While ChatGPT provides immediate feedback and increased efficiency, excessive dependence may weaken essential competencies such as idea organization, reading-to-writing transfer, and thesis development with argumentation (Poláková, 2024; Khampusaen, 2024). It may also encourage shortcut-driven practices that compromise academic integrity and diminish learners' accountability (Naveed et al., 2023; Bozkurt et al., 2023). Given these risks, this study investigates how overreliance on ChatGPT affects writing development and ethical decision-making among SLNHS students. Specifically, it seeks to answer:

1. To what extent do senior high school learners rely on ChatGPT in their academic writing tasks?
2. How does ChatGPT use influence writing skills in terms of:
   2.1 idea organization and coherence,
   2.2 reading-to-writing transfer, and
   2.3 thesis development and argumentation?
3. What are the students' perceptions and practices regarding the ethical use of ChatGPT in writing-related activities?
4. How does the reliance on ChatGPT affect students' academic integrity in producing written outputs?
5. How does the extent of reliance of learners on using ChatGPT affect the overall measure of academic integrity?

Hypothesis

1. There is no significant difference in mean overall writing-skill scores between students with highly reliant, moderately reliant and low reliant usage of ChatGPT.
2. There is no significant difference in mean ethical-perception scores between high-, moderate- and low-reliance groups

Significance of the Study

This study is significant as it examines how ChatGPT reshapes foundational writing competencies and ethical academic behavior within a rural Philippine public high school context. For learners, the findings will clarify whether ChatGPT supports or undermines essential writing skills specifically idea organization, reading-to-writing transfer, and thesis development with argumentation while strengthening awareness of ethical AI use (Poláková, 2024; Khampusaen, 2024; Shidiq, 2023). For teachers, the study provides evidence to refine pedagogy, balance AI integration, and design targeted interventions that preserve authentic writing processes (Naveed et al., 2023; Bozkurt et al., 2023). For policymakers and school leaders, the research offers guidance for AI-responsive policies that uphold

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academic integrity and support ongoing DepEd reforms (Wang et al., 2023; Sun, 2023). For researchers and future researchers, it contributes empirical data from an underrepresented rural context and establishes a methodological foundation for comparative and longitudinal AI-in-education scholarship (Poláková, 2024; Fabro et al., 2024; Zhai, 2024; Levine, 2025).

Theoretical Underpinnings

This study draws on Cognitive Load Theory, Self-Regulation Theory, and Social Learning Theory to explain how overreliance on ChatGPT may affect students' writing skills and ethical behavior. Cognitive Load Theory (Sweller, 1988) suggests that while ChatGPT can reduce extraneous load by providing organized examples, excessive dependence may limit learners' engagement in essential processes such as idea organization, synthesis, and argumentation. Self-Regulation Theory (Zimmerman, 1989) emphasizes the need for learners to monitor and manage their own writing processes; however, readily generated AI outputs may weaken students' motivation and effort in drafting and revising. Social Learning Theory (Bandura, 1977) underscores the importance of collaborative interactions in writing development, yet frequent use of ChatGPT may reduce engagement in peer discussion and teacher feedback. Together, these theories clarify the cognitive, behavioral, and social implications of AI reliance in shaping writing competence and ethical academic practices.

Conceptual Framework

This study is anchored on the premise that students' degree of reliance on ChatGPT shapes both their writing skill development and their ethical academic behavior. Guided by Cognitive Load Theory, Self-Regulation Theory, and Social Learning Theory, the framework posits those levels of ChatGPT reliance (independent variable) influence three core writing skill components idea organization and coherence, reading-to-writing transfer, and thesis development with argumentation as well as ethical awareness and academic integrity (dependent variables). High reliance may reduce cognitive engagement, diminish self-regulatory writing behaviors, and limit social interaction in feedback-rich learning environments, potentially weakening authentic writing competencies. Conversely, moderate or guided use may support learning by scaffolding idea generation and comprehension. This framework also incorporates an intervention component (AI Awareness Symposium) expected to enhance ethical perceptions and responsible use. Together, these relationships inform the study's mixed-methods examination of skill development and ethical conduct.

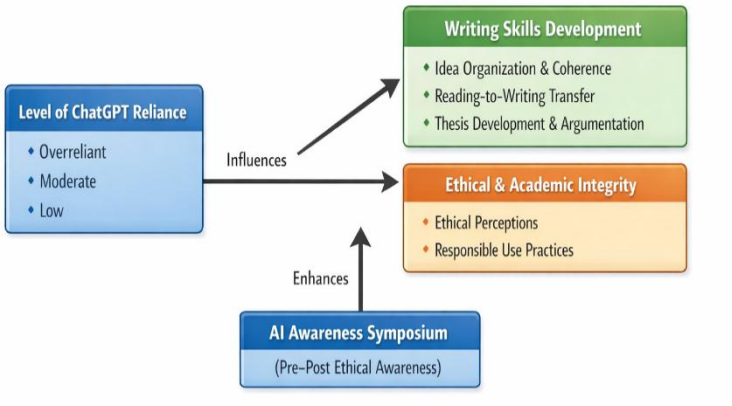

Figure 1. A paradigm showing the connection of the variable in this study

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Scope and Delimitation

This study examines the effects of ChatGPT overreliance on the writing skills and ethical academic behavior of Senior High School learners at Sta. Lucia National High School (SY 2024–2025). It focuses specifically on three writing skill components idea organization, reading-to-writing transfer, and thesis development with argumentation and learners' ethical attitudes toward AI-assisted writing. Quantitative data were limited to 104 purposively selected students who actively use ChatGPT, and qualitative insights were drawn from 16 students and five teachers. The study excludes learners with no prior ChatGPT exposure and does not evaluate long-term skill retention. Findings are confined to the school context and may not be generalizable to other settings.

II. METHODOLOGY

Research Design

This study employs a mixed-methods design to generate a comprehensive analysis of how over-reliance on ChatGPT affects senior high school learners' writing skills and ethical academic behavior. Quantitatively, a descriptive–comparative approach is used through a structured survey measuring ChatGPT usage, perceived impacts on idea organization, reading-to-writing transfer, thesis development, and ethical practice. Complementing this, qualitative data are collected through semi-structured interviews with students and teachers to capture experiential perspectives and contextual nuances. An AI Awareness Campaign Symposium is implemented as an intervention, with pre- and posttests assessing shifts in ethical perceptions. Additionally, rubric-based writing tasks evaluate learners' independent writing performance, allowing triangulation of skill development relative to ChatGPT reliance.

Research Locale

This study was conducted at Sta. Lucia National High School (SLNHS) in Dolores, Quezon, a rural public secondary institution offering senior high school programs. The locale was selected due to the increasing adoption of ChatGPT among its learners and the emerging concerns regarding its effects on writing development and ethical academic behavior. A total of 102 purposively selected Grade 11 and Grade 12 students categorized as heavily, moderately, or slightly reliant on ChatGPT participated in the survey and writing activities, alongside 5 senior high school teachers who contributed professional insights on students' AI-assisted writing practices. For qualitative inquiry, 16 students representing the three reliance categories and the same 5 teachers were interviewed to contextualize AI usage within the school's instructional environment.

Research Instruments and Validation

This study utilized four complementary research instruments to generate rigorous quantitative and qualitative evidence on the effects of ChatGPT over-reliance on learners' writing skills and ethical academic behavior. First, a 20-item Likert-scale survey captured students' perspectives on ChatGPT usage patterns and its perceived influence on ethical decision-making. Second, an analytic writing assessment rubric provided numerical measures of three core writing competencies namely idea organization, reading-to-writing transfer, and thesis development across varying levels of ChatGPT reliance. Third, semi-structured interview guides for teachers and students elicited in-depth insights into AI-mediated writing practices and emerging integrity concerns. Fourth, a five-item pretest and posttest survey documented changes in learners' ethical awareness following an AI Awareness Symposium. All instruments underwent rigorous language, face, and content validation by internal and external experts, ensuring clarity, construct fidelity, and measurement reliability, thereby reinforcing the methodological robustness of the study.

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Data Gathering Procedure

The study followed a multi-phase data collection process integrating surveys, interviews, writing assessments, and an intervention activity. First, a pre-survey was administered to identify qualified participants based on their levels of ChatGPT reliance. The validated 20-item questionnaire was then distributed to 102 purposively selected senior high school learners to gather quantitative data on usage patterns, writing skills, and ethical perceptions. Next, 16 students and 5 teachers participated in semi-structured interviews to obtain qualitative insights into AI-assisted writing practices. Learners subsequently completed three essay-based writing tasks evaluated using an analytic rubric to determine performance differences across reliance groups. An AI Awareness Symposium was implemented as an intervention, followed by the administration of a five-item pretest and posttest to assess changes in ethical awareness. All procedures were conducted systematically to ensure reliability, validity, and coherence across data sources.

Data Analysis

Quantitative data from the 20-item survey were analyzed using descriptive statistics to summarize learners' ChatGPT usage patterns, perceived effects on writing skills, and ethical attitudes. To examine performance differences across the three reliance groups (over-reliant, moderately reliant, and slightly reliant), a Multivariate Analysis of Variance (MANOVA) was employed using scores from the analytic rubric measuring idea organization, reading-to-writing transfer, and thesis development. Pretest and posttest scores on ethical awareness were compared using paired-samples t-tests to determine the effectiveness of the AI Awareness Symposium. Qualitative data from student and teacher interviews were transcribed, coded, and subjected to thematic analysis, enabling the identification of patterns related to AI-assisted writing, learning behaviors, and academic integrity. The integration of statistical and thematic findings ensured a rigorous and comprehensive interpretation of the effects of ChatGPT overreliance.

Ethical Considerations

This study adhered to established ethical standards to ensure the protection, dignity, and rights of all participants. Prior to data collection, permission was secured from the school head of Sta. Lucia National High School, and informed consent was obtained from all student and teacher participants. Learners under 18 were provided assent forms, accompanied by consent from their parents or guardians. Participation was strictly voluntary, with the right to withdraw at any stage without penalty. The researchers carefully reviewed the study's objectives, instruments, consent procedures, and data management plans, demonstrating the research commitment to ethical rigor (Carvajal et al., 2024).

To safeguard confidentiality, no identifying information was required in the survey, interview data were anonymized, and all records were stored securely with restricted researcher access. The study avoided any form of academic coercion by ensuring that teachers did not influence students' responses or participation. Additionally, because the research involved AI-related practices, ethical guidance emphasized responsible use, academic honesty, and the non-punitive handling of disclosures regarding ChatGPT reliance. The study complied with institutional research ethics protocols and aligned with the Data Privacy Act of 2012 (RA 10173).

III. RESULT and DISCUSSIONS

1. Descriptive Results of the 20-item Likert Scale Survey

To examine students' perceptions of ChatGPT's influence on writing skills and ethical academic behavior, descriptive statistics were computed across five subscales: (1) Usage Frequency and Dependency, (2) Idea Organization and Coherence, (3) Reading-to-Writing Transfer, (4) Thesis Development and Argumentation, and (5) Ethical Attitudes and Integrity. Table 1 summarizes the mean scores, standard

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deviations, overall percentage of agreement (combined "agree" and "strongly agree"), and subscale ranking based on weighted means.

Table 1: Descriptive Statistics for the Five Subscales of ChatGPT Use (N = 104)

Subscale	k	Mean	Standard Deviation	Percentage of Agreement	Rank	Interpretation
Usage Frequency and Dependency	4	2.45	0.97	58	4	Moderately high reliance
Idea Organization and Coherence	4	2.53	1.04	61	2	Moderately high improvement
Reading-to-Writing Transfer	4	2.48	1.05	59	3	Moderately high improvement
Thesis Development and Argumentation	4	2.42	1.07	57	5	Moderately high improvement
Ethical Attitudes and Integrity	4	2.29	1.04	64	1	Moderately high level of ethics

Note. Rank is based on weighted mean scores (1 = highest). Agreement percentage refers to the proportion selecting "agree" or "strongly agree."

Usage Frequency and Dependency

Findings reflect a moderate level of reliance on ChatGPT (M = 2.45, SD = 0.97), with students reporting frequent but not excessive use of the tool for academic tasks. While many learners acknowledge turning to ChatGPT for clarification, idea exploration, and writing assistance, the overall pattern suggests a balanced form of engagement rather than full dependency. This moderate reliance indicates that students are integrating AI into their study routines while retaining some autonomy in task completion. However, continued exposure may normalize off-loading cognitive work to AI, highlighting the importance of instructional oversight to prevent long-term skill erosion.

Idea Organization and Coherence

With the highest weighted mean among skill-related subscales (M = 2.53, SD = 1.04), students perceive ChatGPT as significantly helpful in enhancing idea organization, logical flow, and rhetorical coherence. Learners report improvements in structuring arguments and sequencing ideas, suggesting that ChatGPT functions effectively as a cognitive scaffold during writing. However, the elevated SD points to variability in benefit: while some learners use ChatGPT to refine their drafts, others risk substituting AI-generated structures for genuine planning and organization. These results reaffirm the dual nature of AI assistance, supportive when used strategically but detrimental when used as a crutch.

Reading-to-Writing Transfer

Perceptions of reading-to-writing transfer show moderate to high perceived improvement (M = 2.48, SD = 1.05). Many respondents report that ChatGPT helps them understand readings, synthesize key ideas, and connect evidence to written claims. However, item-level responses reveal caution: a majority disagree with depending on ChatGPT to interpret readings for them. This indicates that while students value AI as a supplementary comprehension tool, many remain committed to performing interpretive

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tasks independently. The pattern suggests that ChatGPT supports, but does not replace, critical textual engagement although a subset of learners may still risk superficial processing.

Thesis Development and Argumentation

The subscale on thesis and argumentation obtained a mean of 2.42 (SD = 1.07), indicating moderate improvement in constructing central claims and supporting arguments. Many learners affirm that ChatGPT aids in generating clearer thesis statements, improving logical flow, and strengthening persuasive structures. Nonetheless, a notable majority report they do not struggle to formulate arguments without AI, suggesting that ChatGPT mainly enhances rather than initiates their reasoning processes. Variability in SD implies differing degrees of reliance, raising questions about how students distribute cognitive effort between AI-supported and self-generated reasoning in higher-order writing tasks.

Ethical Attitudes and Integrity

Students demonstrate moderate to high ethical awareness regarding AI use, with a strong majority endorsing the view that unacknowledged reliance on ChatGPT constitutes academic dishonesty. Respondents also consistently report revising and modifying outputs before submission, indicating emerging evaluative literacy in AI-assisted writing. However, neutrality rates across items suggest that some students remain uncertain about academic boundaries. This underscores the necessity of institutional guidance on responsible AI integration to ensure alignment between ethical beliefs and academic practices. Overall, results show that learners recognize both the benefits and ethical responsibilities associated with AI use in academic writing.

2. Multivariate Analysis of Writing Skill Development in Three Writing Tasks Using One Way ANOVA

A one-way MANOVA was conducted to examine whether learners with varying levels of reliance on ChatGPT (Group A: Overreliant, Group B: Moderately Reliant, Group C: Minimally Reliant) differed significantly in their combined writing skill outcomes for Activity 1: Essay-Writing Task, Activity 2: Structured Paragraph Writing Task and Activity 3: Writing Reflection Essay. All analysis is calculated using online MANOVA Calculator (https://www.statskingdom.com/manova-calculator.html) using test parameters in Table 2.

Table 2: One Way MANOVA Test Parameters

Test Statistic: Wilk's Lambda	**Significance Level (α):** 0.05
Post Hoc: MANOVA	**Correlation Method:** Bonferroni
Effect: Medium	**Effect Type:**
Effect Size: 0.25	**Digits:** 4
Multivariate Outliers α: 0.001	**Box's M test at α:** 0.001

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One Way MANOVA Test on Writing Skill Components in Activity 1: Essay-Writing Task

Table 3: Details of the One Way MANOVA Test for Activity 1

Averages				**Data Count**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	1.9412	1.4212	2.0588	Category A	34	34	34
Category B	2.0588	2.0294	2.4412	Category B	34	34	34
Category C	3.2941	3.3235	3.2353	Category C	34	34	34
TOTAL	**2.4314**	**2.2647**	**2.5784**	**TOTAL**	**102**	**102**	**102**
Sample Standard Deviation				**Confidence Interval**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	0.8507	0.6602	1.0714	Category A	[1.6443, 2.2380]	[1.2108, 1.6715]	[1.685, 2.4327]
Category B	0.9516	0.9040	0.8941	Category B	[1.7268, 2.3908]	[1.7140, 2.3448]	[2.1292, 2.7532]
Category C	0.7190	0.9445	0.8896	Category C	[3.0433, 3.5450]	[2.9940, 3.6531]	[2.9249, 3.5457]
TOTAL	**1.0389**	**1.1512**	**1.0665**	**TOTAL**	**[2.2273, 2.6354]**	**[2.0386, 2.4908]**	**[2.3690, 2.7879]**
Normality SW *p*-value				**Multivariate Outliers (Mahalanobis Distance)**			
Group DV	IO[1]	RW[2]	TD[3]	*There are no Multivariate Outliers detected by this test.			
Category A	0.00014	< **0.00001**	0.00005				
Category B	0.00022	0.00025	0.00108	**Legend:** *[1](Idea Organization and Coherence), [2](Reading-to- Writing Transfer), [3](Thesis Development and Argumentation)*			
Category C	0.00008	< **0.00001**	0.00001				

Results revealed a statistically significant and substantial multivariate effect of reliance level on the collective writing skill components, Wilks' $\Lambda = .321$, $F(6, 194) = 24.78$, $p < .001$, partial $\eta^2 = .43$ and Box's $M = 19.43$, $p = .079$. This effect size indicates that 43% of the variance in the combined dependent variables specifically idea organization, reading-to-writing transfer, and thesis development was attributable to differences in ChatGPT-reliance categories, representing a large multivariate effect.

Given the significant omnibus result, post hoc MANOVA comparisons using Wilks' Lambda were conducted for each pairwise group contrast. Although Bonferroni correction yielded an adjusted $\alpha = .01667$, the test's shared measurement structure implies this correction may be overly conservative, potentially suppressing true effects. Nevertheless, comparisons consistently showed significant differences between groups, indicating that ChatGPT dependence levels distinctly influenced writing performance patterns. Overreliant learners (Group A) exhibited marked different writing profiles compared with moderate and minimal users, a finding consistent with cognitive load and self-regulation theories suggesting skill substitution and reduced generative processing among heavy AI users.

Overall, the MANOVA findings for Activity No. 1: Essay-writing Task demonstrate that reliance level on ChatGPT exerts a substantial and statistically robust influence on learners' multicomponent writing performance in an essay-writing context.

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One Way MANOVA Test on Writing Skill Components in Activity 2: Structured Paragraph Writing Task

Table 4: Details of the One Way MANOVA Test for Activity 2

Averages				**Data Count**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	2.2941	1.8529	2.1471	Category A	34	34	34
Category B	2.6765	2.5882	2.1765	Category B	34	34	34
Category C	3.1765	3.4412	3.0882	Category C	34	34	34
TOTAL	**2.7157**	**2.6275**	**2.4706**	**TOTAL**	**102**	**102**	**102**
Sample Standard Deviation				**Confidence Interval**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	0.8359	0.7440	0.6575	Category A	[2.0025, 2.5858]	[1.5934, 2.1125]	[1.9177, 2.3765]
Category B	0.7270	0.8570	0.6729	Category B	[2.4228, 2.9301]	[2.2892, 2.8872]	[1.9417, 2.4112]
Category C	0.6729	0.7046	0.8658	Category C	[2.9417, 3.4112]	[3.1953, 3.6870]	[2.7862, 3.3903]
TOTAL	**0.8251**	**1.0042**	**0.8526**	**TOTAL**	**[2.5536, 2.8777]**	**[2.4302, 2.8247]**	**[2.3031, 2.6338]**
Normality SW *p*-value				**Multivariate Outliers (Mahalanobis Distance)**			
Group DV	IO[1]	RW[2]	TD[3]	*There are no Multivariate Outliers detected by this test.			
Category A	0.00036	0.00003	0.00001				
Category B	0.00015	0.00081	0.00003	**Legend:** *[1](Idea Organization and Coherence), [2](Reading-to- Writing Transfer), [3](Thesis Development and Argumentation)*			
Category C	0.00001	< 0.00001	< 0.00001				

Results showed a statistically significant multivariate effect, Wilks' $\Lambda = .421$, $F(6, 194) = 17.50$, $p < .001$, partial $\eta^2 = .351$ and Box's $M = 11.17$, $p = .514$, indicating a medium-to-large difference in writing performance profiles across the three groups. Approximately 35% of the variance in the combined writing competencies specifically idea organization, reading-to-writing transfer, and thesis development was attributable to ChatGPT reliance level, underscoring a meaningful multivariate relationship.

Post hoc MANOVA pairwise comparisons using Wilks' Lambda, with a Bonferroni-adjusted $\alpha = .01667$, indicated consistent differences among groups, though the correction was acknowledged as conservative and likely to reduce test power. Despite this, patterns strongly suggested that groups differed substantially in how ChatGPT reliance shaped their writing outcomes in structured paragraph construction. Overreliant learners showed more dependence-driven patterns, whereas moderately and minimally reliant students demonstrated more independently constructed textual organization and argumentation.

Overall, Activity 2 results reveal that ChatGPT reliance continues to exert a significant multivariate effect on writing performance even in more constrained, structured writing tasks. These findings suggest that reliance levels influence not only open-ended essay production but also more scaffolded writing activities, highlighting the pervasive role of AI-assisted writing habits in shaping learners' cognitive processing and the quality of their written outputs.

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One Way MANOVA Test on Writing Skill Components in Activity 3: Writing Reflection Essay

Table 5: Details of the One Way MANOVA Test for Activity 3

Averages				**Data Count**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	1.9412	1.7941	1.7059	Category A	34	34	34
Category B	2.7941	2.5294	2.3529	Category B	34	34	34
Category C	3.5000	3.3235	3.3824	Category C	34	34	34
TOTAL	**2.7451**	**2.5490**	**2.4804**	**TOTAL**	**102**	**102**	**102**
Sample Standard Deviation				**Confidence Interval**			
Group DV	IO[1]	RW[2]	TD[3]	Group DV	IO[1]	RW[2]	TD[3]
Category A	0.8507	0.6410	0.5789	Category A	[1.6443, 2.2380]	[1.5705, 2.0178]	[1.5039, 1.9079]
Category B	0.6866	0.6147	0.5440	Category B	[2.5545, 3.0337]	[2.3149, 2.7439]	[1.1631, 2.5427]
Category C	0.6629	0.6382	0.5513	Category C	[3.2687, 3.7313]	[3.1008, 3.5462]	[3.1900, 3.5747]
TOTAL	**0.9717**	**0.8858**	**0.8870**	**TOTAL**	**[2.5542, 2.9360]**	**[2.3750, 2.7230]**	**[2.3062, 2.6546]**
Normality SW *p*-value				**Multivariate Outliers (Mahalanobis Distance)**			
Group DV	IO[1]	RW[2]	TD[3]	*There are no Multivariate Outliers detected by this test.			
Category A	0.00014	< 0.00001	< 0.00001				
Category B	0.00006	0.00001	< 0.00001	**Legend:** *[1](Idea Organization and Coherence), [2](Reading-to- Writing Transfer), [3](Thesis Development and Argumentation)*			
Category C	< 0.00001	< 0.00001	< 0.00001				

Results revealed a statistically significant and large multivariate effect, Wilks' $\Lambda = .315$, $F(6, 194) = 25.23$, $p < .001$, partial $\eta^2 = .438$ and Box's $M = 20.91$, $p = .052$, indicating that nearly 44% of the variance in the collective writing outcomes specifically idea organization, reading-to-writing transfer, and thesis development with argumentation was explained by the students' degree of reliance on ChatGPT. This represents the strongest multivariate effect observed across the three writing activities.

Bonferroni-adjusted post hoc multivariate comparisons ($\alpha = .01667$) showed meaningful distinctions between groups, though the correction is recognized as overly conservative and may underestimate true differences. Nonetheless, patterns strongly suggested that varying levels of ChatGPT reliance significantly shaped learners' reflective writing performance. Overreliant students exhibited greater dependence on AI-assisted reasoning structures, while moderately and minimally reliant learners demonstrated more authentic integration of personal reflection, source interpretation, and argument construction.

Overall, Activity 3 yielded the largest observed multivariate effect across all writing tasks, highlighting that reflective writing which demands deeper metacognition, synthesis, and autonomous meaning-making is especially sensitive to differences in ChatGPT reliance. These results underscore that heavy dependence on AI may constrain the development of introspective writing abilities, while balanced or limited use supports more sophisticated and self-generated reflection.

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Assumption checks supported the robustness of these findings. Mahalanobis distance analysis confirmed no multivariate outliers, and although Shapiro–Wilk tests indicated non-normality ($p < .00001$), MANOVA remained reliable given the sufficiently large group sample sizes of 102 ($n = 34$ person per group). All homogeneity of variance–covariance matrices was upheld for all 3 tests, validating the analytic model. The priori test power was maximal (1.00), reinforcing the reliability of the detected effect.

3. Analysis of Pre–Post Test Scores in Ethical and Responsible ChatGPT Usage

Table 6: Summary of Data of Paired t-Test of Pre and Post Test Scores from the Intervention

Statistical Analysis of Academic Integrity in Using ChatGPT

Subcomponents	Mean		Standard Deviation		Mean Dif.	t Stat	Cohen's d	Decision
	Pre test	Post test	Pre test	Post test				
1. Academic Dishonesty	4.04	4.19	0.61	0.67	0.15	4.33	0.42[a]	Reject Ho
2. Reflects Learners Understanding	3.99	4.18	0.88	0.69	0.19	4.67	0.46[a]	Reject Ho
3. Think Critically and Write Independently	3.40	4.20	1.02	0.73	0.80	14.43	1.41[e]	Reject Ho
4. Learning Tool vs Task Completion	3.64	4.19	0.91	0.58	0.56	10.26	1.01[d]	Reject Ho
5. Responsible Use of ChatGPT	3.68	4.16	0.98	0.58	0.48	8.54	0.84[d]	Reject Ho

**Note: The t test is conducted with the following parameters [1]Sample Size (N=102), [2]α=5%, [3]df=101, [4]t crit = 1.66 (one-tail) and 1.98 (two-tail), [5]p < .001 and [6]The negative sign is ignored since it only reflects the direction of the difference (posttest scores being higher than pretest scores). Effect size magnitude remains positive because Cohen's d represents the size and not the direction of the effect ([a]0.2-0.49 -small to medium, [b].5-medium, [c]0.51-0.79-medium to large, [d]0.8-1.2-large, [e]>1.21-very large)*

Discussion of the Paired t-Test Results

The paired t-test analyses collectively demonstrate that the AI Awareness Intervention produced substantial and statistically significant improvements in learners' ethical understanding, reflective writing behavior, and perceptions of responsible ChatGPT use. Across all five variables, the rejection of the null hypotheses indicates that students' ethical literacy and metacognitive awareness meaningfully increased following the intervention. Learners exhibited stronger recognition that unacknowledged AI use constitutes academic dishonesty, a finding consistent with concerns raised by Naveed et al. (2023) and Bozkurt et al. (2023) regarding the risk of plagiarism and integrity erosion when AI tools are used without critical oversight. Parallel gains in students' commitment to revising AI-generated content and ensuring authorship authenticity reflect the development of reflective and self-regulated writing habits, aligning with Zimmerman's (1989) emphasis on self-regulated learning. The large effect sizes observed in their

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heightened awareness of how excessive reliance weakens independent thinking further affirm the intervention's success in reinforcing cognitive responsibility, echoing the warnings of Poláková (2024) and Khampusaen (2024) that unchecked AI dependence can impede writing development. Moreover, learners demonstrated a significantly clearer distinction between using ChatGPT as a legitimate learning scaffold versus a tool for dishonest task completion; a boundary that Shidiq (2023) argues must be explicitly taught in AI-integrated classrooms. Finally, the significant improvement in learners' confidence in using ChatGPT responsibly indicates strengthened ethical agency and digital citizenship. Overall, the findings confirm that structured pedagogical interventions can meaningfully shape students' ethical orientations and responsible engagement with AI, supporting global calls for explicit instruction and policy development on ethical AI use in education.

4. Qualitative Findings: Themes from Teacher and Learner Interviews

Semi-structured interviews with selected learners and teachers were analyzed using Braun and Clarke's (2006) thematic analysis. Codes were generated inductively from the transcripts and grouped into higher-order themes that complement and contextualize the quantitative findings.

Table 7: Summary of Themes, Codes and Interpretation of Learners and Teachers Interview

Theme	Key Codes	Quotes	Interpretation
Learners' dependency on ChatGPT	"Always", "Most of the time", "Depends on the task"	"Sadly, learners tend to depend too much on ChatGPT sa kanilang writing tasks."	Results highlighted the learners' overreliance on the use of ChatGPT in writing tasks.
Motivation of Learners in using ChatGPT	"easy out", "avoid academic stress", "helps in vocabulary and meaning" "self-expression in English"	"When use responsibly, it will help you be more creative." "Easy to use in writing but risky."	ChatGPT motivates learners by reducing writing stress and supporting vocabulary, creativity, and clearer English self-expression.
Organize ideas and maintain coherence	"having hard time", "disorganized", "negative effect", risk in education"	"Output without ChatGPT is disorganize and lack coherence."	CharGPT weaken learners' ability to independently organize ideas and maintain coherence.
Transfer ideas from reading materials to writing output	"very little transfer", "helps in translating", "the more dependent they are the lessen the ability", "no help at all"	"proves to be degrading, leaners tend to barrow or copy idea directly from AI and not the idea from the reading materials"	Minimal improvement in transferring ideas, noting dependence on ChatGPT hindering authentic comprehension and synthesis of readings.
Develop thesis statements or construct arguments	"Very low ability", "degrading learners' ability", "bad effect", "Cannot produce argument without the help of AI"	"hindi man lang nirere phrase yung outputs from AI tool hindi man lang inedit", "Students, dependent on ChatGPT having hard time in creating	Students struggle to independently formulate thesis statements and construct coherent arguments, largely because of excessive reliance on ChatGPT.

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good arguments."

Ethical implications of Using ChatGPT	"plagiarism", "Copying the output", "Learners are not aware of unethical use", "submitting output that is not their work"	"Alam ko talaga na kopya kase pag teacher ka alam mo na talaga na kopya yung output.", "Kailangan ipa-explain sa bata at itanong kung talaga bang sariling gawa nila yun."	Learners commits plagiarism and unintentional misconduct due to limited awareness of ethical boundaries in AI-assisted writing.
Compromised or supported students' academic integrity	"somewhat helpful It depends on the required output in the subject.", "helpful in when defining terms and looking for information", "hard to identify really"	"I am not sure if it is helpful or harmful.", "Need to teach everyone how to use it responsibly.", "Helpful sya kung tama ang paggamit."	Teacherss view ChatGPT as both helpful and potentially harmful for learners, depending on how responsibly and purposefully it is used.
Addressing students over dependency on ChatGPT	"I am not against in" " will give other activity where AI can't be use", "Can apply and teach the proper way of using it.", ""No credit to give to AI output" "Can't be applied to all written tasks."	"If they can apply it properly and ituro sa kapwa estudyante, helpful yun.", "Kapag pure AI ang output, automatic zero na agad score.", "Okay lang ang paggamit as long as tama at contextualize yung output sa lesson naming."	Teachers address overdependence by enforcing responsible use, designing AI-resistant tasks, and promoting authentic, contextualized student work.
Teachers guide students to use ChatGPT responsibly	"Teachers need to be knowledgeable themselves", "policy is needed", "provide training for teachers", "put declaration forms in the written outputs"	"Mas mahusay pa ang learner kaysa sa teacher kaya dapat may training din ang teacher.", ""Walang policy ang Deped yet on how teachers should deal with AI tools kanya kanyang diskarte."	Teachers highlight the need for training, policies, and guided practices to ensure responsible student use of ChatGPT.

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Recommendations to ensure ChatGPT is integrated ethically	“School should adapt”, “we cannot avoid AI, so teacher should learn first”, “more trainings”, “Teachers and learners’ collaboration"	"Ako kase inoopen ko talaga sa mga bata na gumamit ng technology, but I always say na dapat ay fair use or use it correctly.", ""Let's go back to traditional way of assessment, let the students speak para kahit galing sa AI mai explain nila parin kung alam nila kahit pa galing sa AI yun."	Teachers recommend training, collaboration, and adaptive school policies to ensure ethical and meaningful integration of ChatGPT.

Discussion of Qualitative Results

The thematic analysis of interview data with learners and teachers reveals nuanced insights into how ChatGPT use intersects with usage frequency and dependency, reading-to-writing transfer, thesis development and argumentation, and ethical attitudes and academic integrity. These qualitative patterns not only contextualize the quantitative results but also deepen understanding of how generative AI shapes students’ writing behaviors and ethical reasoning.

Usage Frequency and Dependency

Participants frequently described motivations for using ChatGPT that align with survey evidence of moderate reliance. Learners often framed the tool as an “easy out” that reduces workload and academic stress while aiding vocabulary and self-expression in English: “Easy to use/useful but risky.” This suggests that ease of access and immediate feedback drive habitual use, consistent with Naveed et al.’s (2023) findings that convenience can encourage adoption. However, reliance also carries potential costs; several learners acknowledged that dependence may erode autonomous writing strategies. As one student noted, heavy users “tend to borrow or copy ideas directly from AI and not the idea from the reading materials,” highlighting that convenience may inadvertently diminish active engagement. Teachers responded by advocating for activities where AI cannot replace cognitive effort and by urging explicit instruction on responsible use, reinforcing Bozkurt et al.’s (2023) argument that technology should enhance, not supplant, learning processes.

Reading-to-Writing Transfer

The theme of idea transfer from reading to writing revealed a critical challenge: students felt that ChatGPT sometimes undermines their ability to move deeply from comprehension to composition. Codes such as “very little transfer” and “the more dependent they are the lessened the ability” indicate that dependence may supplant authentic reading engagement. One learner observed that ChatGPT “degrades learning because learners tend to borrow or copy ideas directly from AI and not the idea from the reading materials,” aligning with concerns raised by Poláková (2024) and Khampusaen (2024) that AI may circumvent fundamental cognitive processes in reading-to-writing transfer. However, some participants also acknowledged roles for AI in translating or clarifying complex passages when used judiciously,

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suggesting that benefits emerge when learners remain actively involved in interpretation rather than off-loading it to a model.

Thesis Development and Argumentation

Reflective of structured and essay writing challenges noted quantitatively, qualitative responses underscored diminished ability in thesis and argument construction among overreliant users. Codes such as "very low ability," "degrading learners' ability," and "cannot produce argument without the help of AI" illustrate a perceived weakening of critical reasoning. As one teacher remarked, "Students, dependent on ChatGPT, have a hard time creating good arguments." Another observed that learners "not even try to revise outputs from AI, not even editing the output to construct a good argument," suggesting that dependency may disrupt iterative writing practices. This pattern resonates with Shidiq's (2023) argument that overreliance on AI for higher-order writing tasks can reduce opportunities for internalizing argumentative strategies. The qualitative data thus supports the notion that while ChatGPT can provide templates or examples, without guided reflection it may inhibit the development of independent rhetorical skills.

Ethical Attitudes and Academic Integrity

Themes around ethics revealed both awareness and confusion. Many learners recognized plagiarism risks, with codes like "plagiarism" and "submitting output that is not their work," and one participant stated, "If you're a teacher, you'll know it just by looking if the output is AI generated." This indicates emergent ethical discernment. Yet other responses such as "I am not sure if it is helpful or harmful" and "helpful if used properly" illustrate ambivalence about AI's impact on integrity. Teachers emphasized the importance of policies, training, and explicit norms: "No specific policy yet on how teachers and students should integrate AI." These qualitative insights align with quantitative findings showing significant shifts in ethical perceptions post-intervention, suggesting that guided awareness activities can strengthen academic integrity (Naveed et al., 2023; Bozkurt et al., 2023). Participants also recommended collaborative learning and ongoing discourse to ensure AI integration remains ethical and learning-centered.

Synthesis of Qualitative Results

The qualitative results reveal that ChatGPT's impact on writing is multifaceted: while it offers motivational and supportive functions, it can undermine deep comprehension, independent argumentation, and ethical clarity when used without reflective practice and pedagogical scaffolding. These insights, grounded in learners' and teachers' lived experiences, illustrate how responsible integration requires both structural guidance and explicit ethical frameworks, echoing concerns in existing literature (Poláková, 2024; Shidiq, 2023; Naveed et al., 2023).

Integrated Discussion of Quantitative and Qualitative Findings

Across quantitative and qualitative strands, a coherent pattern emerges: ChatGPT serves as a supportive scaffold for students' writing development yet poses documented risks when used as a substitute for cognitive effort. Consistent with Research Questions 1 and 2, descriptive results and MANOVA findings reveal that students perceive improvements in organization, paraphrasing, and thesis clarity, while interviews confirm they view ChatGPT as an "easy out" that reduces academic stress and assists with vocabulary and idea generation. However, heavy reliance especially among highly dependent

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users consistently predicted weaker outcomes in reading-to-writing transfer and argumentation. This aligns with Cognitive Load Theory (Sweller, 1988), which posits that reducing germane cognitive load undermines skill acquisition; indeed, students admitted to "copying ideas directly from AI" and producing arguments they "cannot defend," indicating diminished independent processing. Thus, the first hypothesis (no difference in writing performance across reliance groups) was rejected, as significant multivariate differences were detected across all writing tasks.

Ethical perceptions and academic integrity (RQ3 to RQ5) displayed an equally strong quantitative–qualitative convergence. Paired t-tests showed significant improvements across all five ethical variables following the AI Awareness Intervention, indicating enhanced recognition of plagiarism, stronger commitment to revising AI outputs, and clearer distinctions between legitimate learning support and dishonest task outsourcing. Teacher insights reinforced these shifts, noting greater student awareness of "submitting work that is not their own" and the need to "revise and contextualize AI output." These outcomes exemplify Self-Regulation Theory (Zimmerman, 1989), where metacognitive monitoring and reflective judgment are strengthened through guided intervention. The second hypothesis (no difference in ethical perceptions across reliance groups) was likewise rejected, as ethical understanding significantly improved after the intervention, demonstrating that learners can develop responsible AI (ChatGPT) use when provided with structured support

The motivational factors underlying ChatGPT reliance illuminate additional theoretical connections. Students reported using ChatGPT for convenience, stress avoidance, and support in English expression behaviors consistent with Social Learning Theory, wherein digital practices are modeled on perceived efficiency rather than mastery (Bandura, 1977). This helps explain contradictions across data: while learners acknowledge the ethical risks of misuse and the cognitive drawbacks of dependence, many still default to AI-generated outputs due to habit, peer norms, or perceived proficiency gaps. The qualitative evidence that "students are better users of AI than teachers" and that institutional guidelines remain absent also reflects emergent gaps in modeling responsible, collaborative technology integration.

Taken together, the integrated findings put emphasis on ChatGPT's educational value depends on pedagogical conditions. When used as a scaffold, it enhances organization, clarity, and engagement; when used as a substitute, it diminishes cognitive effort, reduces reading-to-writing integration, and risks academic dishonesty. The convergence of quantitative and qualitative results indicates a need for explicit AI literacy instruction, structured writing activities that require independent reasoning, and institutional policies that model ethical use. Ultimately, the study demonstrates that effective integration of AI in secondary education must balance technological affordances with instructional strategies that sustain cognitive engagement, ethical awareness, and self-regulated learning ensuring that ChatGPT enhances rather than replaces students' authentic writing development.

IV.CONCLUSION

This study demonstrates that ChatGPT exerts a dual influence on the writing development and ethical awareness of senior high school learners. Quantitative analyses showed that while AI assistance can enhance surface-level writing features such as organization, paraphrasing, and thesis clarity, on the contrary excessive reliance significantly undermines higher-order skills, particularly reading-to-writing transfer and argumentation. MANOVA results confirmed meaningful performance gaps between high-, moderate-, and low-reliance groups, rejecting the hypothesis of equal writing-skill outcomes across levels of dependence. Qualitative findings reinforced this, revealing that students often use ChatGPT as a cognitive shortcut rather than a tool for deeper learning, leading to

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outputs they could "not defend." These patterns affirm Cognitive Load Theory, suggesting that overreliance reduces germane cognitive effort critical for writing mastery.

Equally important, the AI Awareness Intervention significantly strengthened learners' ethical judgment, academic responsibility, and self-regulated writing practices. Paired t-test results rejecting all null hypotheses showed improved recognition of academic dishonesty, greater commitment to revising AI-generated content, and clearer distinctions between responsible use and misconduct. Students' increased confidence in ethical use was supported by teacher observations emphasizing the need for explicit guidance and policy clarity. These outcomes align with Self-Regulation Theory and Social Learning Theory, which posit that reflective practice and guided modeling are essential for developing responsible digital behavior. Overall, the study establishes that ChatGPT can be pedagogically valuable when integrated as a scaffold for learning, but it requires intentional instructional design and ethical oversight to prevent dependency and safeguard academic integrity.

V. RECOMMENDATION

1. Integrate Structured AI Literacy Programs. Schools should institutionalize instructional modules that explicitly teach ethical AI use, source acknowledgment, and critical evaluation of AI outputs. These modules should be embedded in writing-intensive subjects and aligned with emerging DepEd guidelines to ensure uniform understanding of responsible practice.
2. Design Writing Tasks that Require Cognitive Engagement. Teachers should incorporate writing activities that limit the feasibility of AI-generated shortcuts such as personalized reflections, localized case analyses, oral defenses, and iterative drafting ensuring students apply independent reasoning rather than substituting AI output for authentic work.
3. Implement Clear School-Level AI Policies. Administrators should establish policies on when and how ChatGPT may be used, including disclosure requirements, acceptable-use boundaries, and academic honesty protocols. Such policies must be communicated to teachers, learners, and parents to support consistent enforcement.
4. Provide Continuous Professional Development for Teachers. Because "students are better users of AI than teachers," targeted training is necessary to equip educators with the competencies to evaluate AI-generated work, design AI-resilient assessments, and model ethical behaviors aligned with Bandura's social learning principles.
5. Encourage Balanced Use Through Self-Regulation Strategies. Teachers should guide students in using ChatGPT as a supplementary tool rather than a primary author. Techniques such as revision logs, metacognitive checklists, and reflection journals can reinforce mindful engagement and strengthen self-regulated learning.
6. Expand Research Through Longitudinal and Comparative Studies. Future research should examine the long-term impact of AI reliance on writing skills, compare performance across different school contexts, and explore variables such as AI literacy, prompt engineering, and academic motivation to deepen theoretical insights.

Collectively, these recommendations advocate for a balanced, ethical, and pedagogically grounded integration of AI in secondary education ensuring that ChatGPT enhances learning without compromising critical thinking, independent writing, and academic integrity.

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