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THE INFLUENCE OF CHATGPT ON CRITICAL THINKING SKILLS IN WRITING AMONG RELIANT AND NON-RELIANT GRADE 10 STUDENTS

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ABSTRACT

The integration of generative artificial intelligence (AI) tools such as ChatGPT has transformed writing instruction by providing immediate assistance in idea generation, organization, and language refinement. While these capabilities may enhance writing performance, concerns remain regarding their potential influence on students' critical thinking skills, particularly among learners who rely heavily on AI-generated outputs. This study examined the influence of ChatGPT on the critical thinking skills in writing of Grade 10 students in the Schools Division of Calbayog City, Philippines. Specifically, it categorized students as reliant or non-reliant users of ChatGPT, described their demographic profiles in terms of number of available gadgets, internet connectivity, socio-economic status, and geographic location, determined the relationship between ChatGPT reliance and these demographic variables, and compared the critical thinking skills in writing of the two groups. A descriptive-comparative research design was employed involving 342 Grade 10 students selected through stratified random sampling from sixteen public secondary schools. Data were collected using a researcher-developed ChatGPT Reliance Scale and the Paul and Elder Critical Thinking in Writing Rubric. Descriptive statistics, Chi-square test of independence, and Mann–Whitney U test were used for data analysis. Results revealed that most participants were classified as ChatGPT-reliant learners. Among the demographic variables, only socio-economic status demonstrated a statistically significant relationship with ChatGPT reliance, whereas the number of available gadgets, internet connectivity, and geographic location showed no significant association. Furthermore, non-reliant learners demonstrated significantly higher levels of critical thinking in writing than reliant learners. The findings suggest that although ChatGPT can serve as a valuable instructional support tool, excessive reliance may hinder the development of independent reasoning and critical thinking in writing. The study underscores the need for structured and ethical AI integration in English instruction and supports the development of policies and instructional practices that promote responsible AI use while strengthening students' critical thinking skills.

Keywords: Artificial Intelligence, ChatGPT, Ai-assisted Writing, Critical Thinking, Writing Instruction, Grade 10 Students, Educational Technology.

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1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has transformed educational practices, particularly in writing instruction. Among the most widely used generative AI tools is ChatGPT, a large language model capable of assisting learners in generating ideas, organizing content, revising drafts, and improving language use. Its accessibility and ability to provide immediate feedback have encouraged students to integrate AI into various writing tasks. Consequently, educators and researchers have increasingly explored the educational potential of ChatGPT while also examining its implications for students' cognitive development and academic integrity.

Recent studies suggest that ChatGPT can support writing by enhancing idea generation, language proficiency, and revision processes when used as a supplementary learning tool. It can facilitate brainstorming, improve coherence, and provide immediate feedback that enables learners to refine their written outputs. Moreover, structured interaction with AI has been shown to promote reflective learning, analytical reasoning, and collaborative knowledge construction when integrated within well-designed instructional activities. These findings indicate that AI can function as an effective educational resource when learners actively evaluate and refine AI-generated responses rather than accept them uncritically.

Despite these potential benefits, concerns remain regarding excessive reliance on AI-generated content. Heavy dependence on ChatGPT may reduce learners' opportunities to engage in independent reasoning, evaluate evidence critically, and construct original arguments. Overreliance may also encourage superficial learning, cognitive offloading, and diminished development of higher-order thinking skills, particularly when AI-generated responses are accepted without verification or reflection. These concerns underscore the need to examine how students' patterns of AI use influence their critical thinking performance, especially in writing, where reasoning, analysis, and evidence-based argumentation are essential.

The growing integration of AI in education has likewise prompted educational institutions to establish policies that encourage responsible and ethical AI use. Rather than prohibiting AI technologies, current educational initiatives emphasize their purposeful integration while maintaining academic integrity, originality, and independent thinking. This shift highlights the importance of generating empirical evidence that can guide educators in balancing the instructional advantages of AI with the continued development of learners' critical thinking skills.

Although previous investigations have examined ChatGPT's role in writing instruction, much of the existing literature has focused on higher education, with relatively limited attention given to secondary school learners. Furthermore, few studies have directly compared students with varying levels of reliance on ChatGPT or examined how demographic factors—including the number of available gadgets, internet connectivity, socio-economic status, and geographic location—relate to AI reliance and critical thinking performance. Addressing these gaps is particularly important because differences in access to technology and patterns of AI use may influence how learners develop writing and reasoning skills.

This study investigated the influence of ChatGPT on the critical thinking skills in writing of Grade 10 students in the Schools Division of Calbayog City, Philippines. Specifically, it categorized students as ChatGPT-reliant and non-reliant learners, examined their demographic characteristics, analyzed the relationship between ChatGPT reliance and selected demographic variables, and compared the critical thinking skills in writing of the two groups. By providing empirical evidence on how varying levels of ChatGPT reliance relate to students' writing performance, the study contributes to the growing body of research on AI-

assisted learning and offers practical insights for the effective and ethical integration of artificial intelligence in secondary English instruction.

2. METHOD

2.1. Research Design

This study employed a quantitative descriptive-comparative research design to examine the influence of ChatGPT on the critical thinking skills in writing of Grade 10 students. The design enabled the comparison of critical thinking performance between students classified as ChatGPT-reliant and non-reliant without manipulating the variables under investigation. It also facilitated the examination of the relationship between students' extent of ChatGPT reliance and selected demographic variables, including the number of available gadgets, internet connectivity, socio-economic status, and geographic location.

Data were collected using two research instruments. The first was a researcher-developed ChatGPT Reliance Scale, which measured the extent to which students depended on ChatGPT in performing writing tasks. Based on the obtained scores, participants were categorized as either ChatGPT-reliant or non-reliant learners. The second instrument was the Paul and Elder Critical Thinking in Writing Rubric (Paul & Elder, 2008), which was used to evaluate students' critical thinking skills as demonstrated in a timed essay writing task. To ensure objectivity, two trained raters independently evaluated the essays using the adopted analytic rubric.

Descriptive statistics, including frequencies, percentages, and median scores, were used to summarize the respondents' demographic characteristics, level of ChatGPT reliance, and critical thinking performance. The Chi-square test of independence was employed to determine the relationship between ChatGPT reliance and the selected demographic variables, while the Mann–Whitney U test was used to examine differences in the critical thinking skills in writing between ChatGPT-reliant and non-reliant students. This research design provided an appropriate methodological framework for describing students' AI reliance and determining whether differences in reliance were associated with variations in critical thinking performance.

2.2. Participants

The participants were 342 Grade 10 students enrolled in 16 public secondary schools in the Schools Division of Calbayog City, Philippines, during the School Year 2025–2026. Schools were selected through total enumeration, while respondents were chosen using stratified random sampling to ensure adequate representation across participating schools. Based on their scores on the researcher-developed ChatGPT Reliance Scale, students were classified as ChatGPT-reliant or non-reliant learners for comparative analysis.

2.3. Research Instruments

Two instruments were used to collect the data. The first was a researcher-developed ChatGPT Reliance Scale, a 10-item, five-point Likert questionnaire designed to measure students' reliance on ChatGPT in writing tasks. Higher scores indicated greater reliance on the AI tool.

The second instrument was the Paul and Elder Critical Thinking in Writing Rubric (Paul & Elder, 2008), an adopted analytic rubric that assessed students' critical thinking in writing across seven intellectual standards: purpose and clarity, question or problem at issue, information and evidence, concepts and theories, assumptions and perspectives, implications

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and consequences, and logic and coherence. Students' essays were independently evaluated by two trained raters, and the average of their ratings was used for analysis.

2.4. Data Collection

Prior to data collection, approval was obtained from the Department of Education Regional Office VIII, the Schools Division Office of Calbayog City, and the participating school heads. Data were collected from the selected Grade 10 students during scheduled class or vacant periods. Participants first completed the researcher-developed ChatGPT Reliance Scale, after which they completed a timed essay writing task. The essays were independently evaluated by two trained raters using the Paul and Elder Critical Thinking in Writing Rubric. All data were treated confidentially, and participation was voluntary.

2.5. Data Analysis

Descriptive statistics, including frequencies, percentages, and median scores, were used to summarize the respondents' demographic characteristics, ChatGPT reliance, and critical thinking performance. The Chi-square test of independence determined the relationship between ChatGPT reliance and the selected demographic variables, while the Mann–Whitney U test compared the critical thinking skills in writing of ChatGPT-reliant and non-reliant students. All statistical analyses were conducted at a 0.05 level of significance.

2.6. Ethical Considerations

Ethical approval was obtained from the Samar State University Research Ethics Committee (Ethics Clearance No. 2025-0079-G) prior to the conduct of the study. Administrative permission was likewise secured from the Department of Education Regional Office VIII, the Schools Division Office of Calbayog City, and the participating school heads. Participation was voluntary, and students were provided with an age-appropriate explanation of the study's purpose and procedures before data collection. All responses and writing outputs were treated with strict confidentiality, anonymized during analysis, and used solely for research purposes. Participants were informed of their right to withdraw from the study at any stage without any academic or personal consequences.

3. RESULTS AND DISCUSSION

3.1. Classification of ChatGPT-Reliant and Non-Reliant Students

Proportion of Reliant and Non-Reliant Grade 10 Students in the Use of ChatGPT in the Critical Thinking Skills in Writing

Student's ChatGPT User Category	Score	No. of Students	Percent
Reliant	> 26	194	56.70
Non-Reliant	≤ 25	148	43.30
Total		**342**	**100.0**

Table 1 presents the classification of the respondents based on their ChatGPT Reliance Scale scores. Of the 342 Grade 10 students, 194 (56.70%) were classified as ChatGPT-reliant, while 148 (43.30%) were categorized as non-reliant. These findings indicate that the majority

of the respondents relied on ChatGPT when performing writing tasks that required critical thinking.

The relatively higher proportion of ChatGPT-reliant students suggests that generative AI has become an important academic support tool, particularly for idea generation, organization, and language refinement. The accessibility and convenience of ChatGPT may encourage students to use it to reduce the cognitive demands associated with writing tasks. However, frequent reliance on AI-generated outputs may also limit opportunities for independent planning, analysis, and revision, which are essential components of critical thinking in writing.

The finding is consistent with previous studies reporting the increasing adoption of ChatGPT in academic writing because of its ability to generate coherent drafts, provide immediate feedback, and assist with complex writing tasks (Kasneci et al., 2023). Likewise, Lo (2023) and Jacob et al. (2025) observed that students often use AI tools when completing cognitively demanding writing activities, while Zhao et al. (2025) cautioned that excessive reliance on AI may reduce learners' engagement in higher-order thinking processes. These findings underscore the need for instructional practices that promote the responsible use of AI while preserving students' independent critical thinking and writing skills.

3.2. Demographic Profile of the Respondents

Demographic Profile of the Respondents

Variable	**Category**	***n***	**%**
Number of Available Gadgets	5 gadgets	6	1.75
	4 gadgets	29	8.48
	3 gadgets	5	1.46
	2 gadgets	116	33.92
	1 gadget	186	54.39
Total		**342**	**100.00**
Internet Connectivity [Non-Reliant (n=148)]	>50 Mbps	23	15.54
	10-50 Mbps	73	49.32
	3-10 Mbps	41	27.70
	<3 Mbps	11	7.43
Total		**148**	**100.00**
Internet Connectivity [Reliant (n=194)]	>50 Mbps	24	12.37
	10-50 Mbps	95	48.97
	3-10 Mbps	59	30.41
	<3 Mbps	16	8.25
Total		**194**	**100.00**

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Monthly Household Income [Non-Reliant (n=148)]	More than ₱60,000	4	2.70
	₱40,001-₱60,000	5	3.38
	₱20,001-₱30,000	29	19.59
	₱10,001-₱20,000	51	34.46
	Less than ₱10,000	59	39.86
Total		**148**	**100.00**
Monthly Household Income [Reliant (n=194)]	More than ₱60,000	**7**	3.61
	₱40,001-₱60,000	4	2.06
	₱20,001-₱30,000	27	13.92
	₱10,001-₱20,000	46	23.71
	Less than ₱10,000	110	56.70
Total		**194**	**100.00**
Residential Area [Non-Reliant (n=148)]	Highly Urbanized	0	0.00
	Urban	66	44.59
	Suburban	13	8.78
	Rural	60	40.54
	Remote Rural	9	6.08
Total		**148**	**100.00**
Residential Area [Reliant (n=194)]	Highly Urbanized	3	1.55
	Urban	70	36.08
	Suburban	23	11.86
	Rural	80	41.24
	Remote Rural	18	9.28
Total		**194**	**100.00**

Note. n = frequency; % = percentage

Table 2 presents the demographic profile of the respondents in terms of the number of available gadgets, internet connectivity, monthly household income, and residential area. More than half of the respondents (54.39%) owned only one gadget, followed by those with two gadgets (33.92%), while only a few had three (1.46%), four (8.48%), or five (1.75%) gadgets.

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This indicates that most students had limited access to digital devices, yet such access was sufficient to utilize ChatGPT, likely through smartphones.

Regarding internet connectivity, respondents were categorized according to the strength of their internet connection and their ChatGPT usage classification. Among the ChatGPT-reliant students (n = 194), the largest proportion (48.97%) reported internet speeds of 10–50 Mbps, followed by 30.41% with 3–10 Mbps, 12.37% with speeds greater than 50 Mbps, and 8.25% with speeds below 3 Mbps. Similarly, among the non-reliant students (n = 148), 49.32% had internet speeds of 10–50 Mbps, 27.70% had 3–10 Mbps, 15.54% had speeds greater than 50 Mbps, and 7.43% had speeds below 3 Mbps. Overall, nearly half of the respondents (49.12%) reported internet speeds of 10–50 Mbps, followed by 29.24% with 3–10 Mbps, 13.74% with speeds greater than 50 Mbps, and 7.89% with speeds below 3 Mbps. These findings indicate that most respondents, regardless of ChatGPT reliance, reported internet connectivity within the 10–50 Mbps range.

In terms of monthly household income, 39.86% of the non-reliant students came from households earning less than ₱10,000 per month, followed by 34.46% with household incomes ranging from ₱10,000 to ₱20,000, 19.59% from ₱20,001 to ₱30,000, 3.38% from ₱40,001 to ₱60,000, and 2.70% with incomes exceeding ₱60,000. Among the ChatGPT-reliant students, more than half (56.70%) belonged to households earning less than ₱10,000 monthly, while 23.71% reported incomes of ₱10,000–₱20,000, 13.92% earned ₱20,001–₱30,000, 2.06% earned ₱40,001–₱60,000, and 3.61% had household incomes above ₱60,000. Overall, nearly half of the respondents (49.42%) came from households earning less than ₱10,000 per month, followed by 28.36% with incomes of ₱10,000–₱20,000, 16.37% with ₱20,001–₱30,000, 2.63% with ₱40,001–₱60,000, and 3.22% with incomes exceeding ₱60,000. These findings indicate that both ChatGPT-reliant and non-reliant students predominantly came from low-income households, although the proportion was notably higher among the ChatGPT-reliant group.

With respect to residential area, 44.59% of the non-reliant students resided in urban areas, followed by 40.54% in rural communities, 8.78% in suburban areas, and 6.08% in remote rural areas, while none were from highly urbanized areas. Among the ChatGPT-reliant students, the largest proportion (41.24%) resided in rural areas, followed by 36.08% in urban areas, 11.86% in suburban areas, 9.28% in remote rural areas, and 1.55% in highly urbanized areas. Overall, most respondents came from rural communities (40.94%), closely followed by urban areas (39.77%), while smaller proportions resided in suburban (10.53%), remote rural (7.89%), and highly urbanized areas (0.88%). These findings indicate that the respondents were primarily drawn from rural and urban communities, with relatively few students residing in suburban, remote rural, or highly urbanized areas.

Overall, the respondents were characterized by limited gadget ownership, moderate internet connectivity, predominantly low household income, and residence in rural and urban communities. These demographic characteristics provide important context for interpreting students' patterns of ChatGPT use and their critical thinking skills in writing.

3.3. Relationship Between ChatGPT Reliance and Demographic Variables

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Relationship Between the Proportion of the ChatGPT-Reliance and Non-Reliance of Grade 10 Students in Critical Thinking Skills in Writing and Their Demographic Profile

Profile	χ^2-*value*	p-value	Evaluation
No. of Gadgets	8.398	0.078	NS
Internet Connectivity	0.897	0.826	NS
Socio-Economic	10.655	0.030	S
Residential Areas	5.668	0.226	NS

Significant at p<0.05

Table 3 presents the relationship between ChatGPT reliance and the respondents' demographic variables. Chi-square analysis revealed that socio-economic status was the only variable significantly associated with ChatGPT reliance ($\chi^2 = 10.655$, $p = 0.030$). In contrast, the number of available gadgets ($\chi^2 = 8.398$, $p = 0.078$), internet connectivity ($\chi^2 = 0.897$, $p = 0.826$), and residential area ($\chi^2 = 5.668$, $p = 0.226$) were not significantly related to students' reliance on ChatGPT.

The findings indicate that students' reliance on ChatGPT is influenced more by their socio-economic circumstances than by their access to technology or place of residence. Students from lower-income households may rely on ChatGPT as an accessible academic support due to limited access to supplementary learning resources, such as tutoring, reference materials, and writing assistance. Conversely, students with greater economic resources may have alternative forms of academic support, reducing their dependence on AI tools.

These findings are consistent with Perera and Lankathilake (2023), who emphasized that students' interactions with AI are shaped by institutional support and socio-economic realities rather than technological access alone. Similarly, Ojong (2025) noted that students from low socio-economic backgrounds often receive less academic support at home, increasing their dependence on readily available digital learning tools. Bo (2025) likewise argued that socio-economic status influences students' opportunities to engage effectively with educational technologies through its impact on access to learning resources and support systems.

The absence of significant relationships between ChatGPT reliance and the number of gadgets, internet connectivity, and residential area suggests that basic access to technology is no longer a primary determinant of AI use. As smartphones and internet services have become increasingly available, students can utilize text-based AI applications such as ChatGPT regardless of the number of devices they own, the strength of their internet connection, or their geographic location. These findings imply that educational and socio-economic factors play a more substantial role than technological access in shaping students' reliance on generative AI for writing tasks.

3.4. Level of Critical Thinking Skills in Writing

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Level of Critical Thinking Skills in Writing of the Reliant and Non-Reliant Grade 10 Students on the Use of ChatGPT in Writing

Writing Skill Level	Student's ChatGPT User Category				Total	Percent
	Non-Reliant	Percent	Reliant	Percent		
Exemplary	15	10.14	12	6.19	27	7.89
Proficient	44	29.73	35	18.04	79	23.10
Developing	51	34.46	58	29.90	109	31.87
Beginning	38	25.68	89	45.88	127	37.13
Total	148	100.00	194	100.00	342	100.00

Legend: *25 – 28 Exemplary*
19 – 24 Proficient
13 – 18 Developing
7 – 12 Beginning

Table 4 presents the distribution of the respondents' critical thinking skills in writing according to ChatGPT reliance. Among the non-reliant students, 10.14% attained the Exemplary level and 29.73% reached the Proficient level, compared with only 6.19% and 18.04%, respectively, among ChatGPT-reliant students. Conversely, 45.88% of the ChatGPT-reliant group were classified at the Beginning level, substantially higher than the 25.68% recorded among non-reliant students. Overall, 37.13% of the respondents were at the Beginning level, followed by 31.87% at the Developing level, 23.10% at the Proficient level, and 7.89% at the Exemplary level. These findings indicate that non-reliant students generally demonstrated stronger critical thinking skills in writing than their ChatGPT-reliant counterparts.

The results suggest that excessive reliance on ChatGPT may be associated with weaker performance in writing tasks requiring independent reasoning, analysis, and evaluation. Students who relied less on ChatGPT were more likely to demonstrate coherent argumentation, logical organization, and effective use of supporting evidence, whereas a larger proportion of ChatGPT-reliant students exhibited limited critical engagement. These findings are consistent with previous studies indicating that excessive dependence on generative AI tools may reduce learners' engagement in higher-order cognitive processes by encouraging surface-level processing rather than independent analysis and synthesis (Kasneci et al., 2023; Khalil & Er, 2023; Zhai et al., 2023). Similarly, Dizon (2023) reported that Filipino students who heavily depend on digital writing tools tend to exhibit lower originality and critical engagement.

The concentration of ChatGPT-reliant students at the Beginning and Developing levels further suggests that frequent dependence on AI-generated outputs may limit opportunities to develop planning, monitoring, revision, and analytical reasoning skills. In contrast, the higher proportion of non-reliant students at the Proficient and Exemplary levels reflects stronger independent writing performance and critical thinking. These findings underscore the importance of integrating ChatGPT as a learning support rather than a substitute for students' own reasoning and writing processes, thereby promoting responsible AI use while strengthening critical thinking skills.

3.5 Comparison of Critical Thinking Skills Between ChatGPT-Reliant and Non-Reliant Students

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Comparison Between the Level of Critical Thinking Skills in Writing of the ChatGPT-Reliant and Non-Reliant Grade 10 Students

Student's ChatGPT Usage Category	Mean Rank	Sum of Ranks	*u*-value	*z*-value	*p*-value	Evaluation
Non-Reliant	197.49	29228.00	10510	-4.256	.000	Significant
Reliant	151.68	29425.00				

Significant p<0.05

Table 5 presents the comparison of the critical thinking skills in writing of ChatGPT-reliant and non-reliant students using the Mann–Whitney U test. The analysis revealed a statistically significant difference between the two groups (U = 10,510.000, z = -4.256, p < .001). Non-reliant students obtained a higher mean rank (197.49) than ChatGPT-reliant students (151.68), indicating better critical thinking performance in writing. These findings suggest that students who relied less on ChatGPT demonstrated stronger abilities in analyzing information, constructing logical arguments, evaluating evidence, and expressing independent ideas in their written outputs.

The results support the view that while ChatGPT can enhance writing efficiency and provide instructional assistance, excessive reliance on AI-generated responses may reduce opportunities for learners to engage in independent reasoning and higher-order thinking. Students who complete writing tasks with minimal dependence on AI are more likely to develop essential critical thinking skills through active planning, analysis, evaluation, and revision. This finding aligns with Cognitive Load Theory, which posits that meaningful learning occurs when learners actively process information rather than depend on external cognitive aids. It also supports the Technology Acceptance Model and Social Cognitive Theory, which emphasize that the educational value of technology depends on how it is used to facilitate, rather than replace, cognitive engagement.

The findings are consistent with previous studies reporting that overreliance on generative AI may hinder the development of critical thinking and independent writing skills (Kasneci et al., 2023; Lo, 2023; Zhao et al., 2025). Although ChatGPT offers substantial benefits for brainstorming, language refinement, and feedback, its educational effectiveness depends on responsible and purposeful use. Therefore, AI should be integrated as a complementary learning tool that supports students' thinking processes while preserving opportunities for independent analysis, reflection, and evidence-based writing.

4. CONCLUSION

This study examined the influence of ChatGPT reliance on the critical thinking skills in writing of Grade 10 students in the Schools Division of Calbayog City. The findings revealed that the majority of the respondents were classified as ChatGPT-reliant learners. Among the demographic variables examined, only socio-economic status was significantly associated with ChatGPT reliance, whereas the number of available gadgets, internet connectivity, and residential area showed no significant relationship.

The results further demonstrated that non-reliant students exhibited higher levels of critical thinking in writing than ChatGPT-reliant students. This finding was confirmed by the Mann–Whitney U test, which indicated a statistically significant difference between the two groups, with non-reliant learners outperforming their ChatGPT-reliant counterparts. The

results suggest that while ChatGPT can serve as a valuable instructional support tool, excessive reliance on AI-generated content may limit opportunities for students to develop independent reasoning, analysis, and evidence-based writing.

Overall, the study highlights the importance of promoting the responsible and ethical integration of ChatGPT in English instruction. Rather than replacing students' cognitive processes, AI should be used to facilitate learning while encouraging independent thinking, critical evaluation, and original written expression. These findings provide empirical support for instructional practices and educational policies that balance the benefits of AI-assisted learning with the continued development of students' critical thinking skills.

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6. CONFLIC OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this article. The authors have no financial, professional, or personal relationships that could have influenced the design, conduct, analysis, interpretation, or reporting of this study.

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