Collaborative Writing Engagement, AI-Assisted Tools, and Self-Regulation as Antecedents in Grade 11 Writing Skills

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ABSTRACT

Writing proficiency remains a challenge for Filipino secondary students particularly as they transition into an academically demanding year. This study addressed this gap by looking into how collaborative writing engagement, the use of AI-assisted tools, and self-regulation during writing influence the writing skills of Grade 11 students. Using a descriptive-correlational research design, data were gathered from 114 participants through a researcher-made questionnaire and a validated analytical writing rubric. Data analysis involved descriptive statistics and multiple regression analysis. The findings revealed that the participants demonstrated high levels of collaborative writing engagement, AI-assisted tool utilization, and self-regulation. However, their actual writing skills as measured across content, organization, grammar, vocabulary, and mechanics were only at a moderate level. Regression analysis revealed that the whole model is highly significant, which means, that the three variables collectively contribute to the writing skills. Furthermore, taken singly, the results indicated that collaborative writing engagement and the use of AI-assisted tools were significant predictors of writing skills, whereas self-regulation was not a significant predictor in this context. Based on these findings, self-regulation may be given equal importance in the instructional process specifically in the context of public schools. Furthermore, future researchers are encouraged to conduct large-scale studies to deepen the understanding of how these variables interact within the educational landscape of Northern Mindanao.

Keywords: Collaborative Writing Engagement, AI-Assisted Tools, Self-Regulation, Writing, Writing Skills, Grade 11 Students

INTRODUCTION

Writing is one of the most significant yet difficult skills in learning the English language as it is a key to academic and lifelong communication. Writing proficiency remains a major challenge for Filipino secondary students especially as they progress through more challenging academic schedules towards their Senior High School years. It is the quality of writing that students usually struggled with, especially in the development of content, organizational coherence, grammatical correctness, vocabulary choice, and mechanical accuracy (Atasoy, 2021). A promising line of research was the investigation of how learners interact in collaborative writing and what this interaction has to do with writing performance. The concept of collaborative writing engagement was used to indicate how actively learners are involved in collective writing activities, such as joint planning, peer feedback, collective revision, and collaborative text construction (Elabdali, 2021).

At the same time, the rapid adoption of artificial intelligence technologies in the educational setting has brought new variables that can affect the development of writing. Grammar checkers, paraphrasing applications, and generative text platforms are AI-assisted writing tools that have become widely available to students providing real-time feedback, error correction, and writing support (Fitria, 2021).

In addition, affective factors in writing must also be considered when examining the determinants that can potentially define writing success. The capacity to control emotions in writing, or to regulate feelings of anxiety, frustration, and inspiration during the writing process, has been seen as one of the most important aspects of self-regulated learning that can have a direct effect on the writing performance (MacArthur & Philippakos, 2022).

This paper fills this gap by exploring collaborative writing engagement, AI-assisted writing, and self-regulation during writing as the potential predictors of the writing skills of Grade 11 students across five dimensions: content, organization, grammar, vocabulary, and mechanics. This descriptive-correlational study explored the connections between these predictor variables and writing performance by conducting research involving 114 Grade 11 students at a national high school in the Division of Bukidnon during the second semester of the 2025-2026 academic year.

The results help provide a better understanding of writing development in Philippine secondary education and align with the need to improve the quality of education as stated in the United Nations Sustainable Development Goal (UN-SDG) No. 4.

Statement of the Problem

This study investigated the relationships between collaborative writing engagement, the use of AI-assisted tools, emotional regulation during writing, and the writing skills of Grade 11 students in a national high school in the Division of Bukidnon during the second semester of the 2025-2026 academic year. Specifically, this research sought to answer the following questions:

1. What is the level of the participants' collaborative writing engagement?

2. What is the participants' self-report on their emotional regulation during writing?

3. What is the extent of the participants' use of AI-assisted tools?

4. What is the level of the participants' writing skills in terms of:

    4.1 content;
    4.2 organization;
    4.3 grammar;
    4.4 vocabulary; and
    4.5 mechanics?

5. Are the participants' collaborative writing engagement, emotional regulation during writing, and use of AI-assisted tools significantly associated their writing skills?

Hypotheses

At 0.05 level of significance, the following null hypotheses were tested:

$H0_1$: Collaborative writing engagement, self-regulation, and use of AI-assisted tools are not significantly associated with the writing skills of Grade 11 students.

$H0_2$: There is no significant relationship between collaborative writing engagement and writing skills of Grade 11 students.

$H0_3$: There is no significant relationship between emotional regulation during writing and writing skills of Grade 11 students.

$H0_4$: There is no significant relationship between the use of AI-assisted tools and writing skills of Grade 11 students.

RESEARCH METHODS

This research used a descriptive-correlational research design to test the relationship between the collaborative writing engagement, AI-assisted tools, self-regulation during writing, and the writing skills of Grade 11 students in a national high school in the Division of Bukidnon. Additionally, multiple regression analysis was applied

to establish whether the three independent variables had a significant effect on writing skills when taken together. The analysis determined the specific variable with the highest predictive power for writing performance, while also establishing the overall predictive power of all the three independent variables combined in explaining the variances in writing skills across the five dimensions of content, organization, grammar, vocabulary, and mechanics.

In this study, 114 Grade 11 students were involved. The sample population was drawn from a national high school in the Division of Bukidnon during the academic year 2025-2026. The students were chosen according to the following criteria: they were in Grade 11 during the second semester and were willing to take part in the study through signed informed consent and assent procedures. The sampling utilized partial enumeration, with 114 participants identified based on the advisers' master list.

The research employed two research instruments to examine the connections between collaborative writing engagement, the use of AI-assisted writing tools, emotional regulation during writing, and the writing skills of Grade 11 students. The first tool consisted of a self-administered questionnaire that was used to gauge the independent variables of the research. The researcher-made survey questionnaires on collaborative writing engagement, use of AI-assisted tools, and emotional regulation were validated by the three members of the defense panel after the research proposal presentation to guarantee their clarity, relevance, and consistency with the purpose of the research. These three panel members comprised the Vice President for Administration, the Vice President for Academic Affairs, and the Quality Assurance Chairperson. They are also thesis writing professors and advisers who actively produce quality research studies that have been published internationally.

The second instrument was an analytical rubric adapted from the study by Agan and Deniz entitled "A Rubric Study for Assessing Paragraph Level Written Texts" published in the *Journal of Education and Training Studies* (Vol. 8, No. 1) in January 2020, and from the study of Phetsangkhad and Phisaiphun (2022) entitled "Scoring Rubric Development of Writing Assessment for EFL Students," published in the *Journal of Religious and Cultural Research*. This combined instrument was used to assess students' writing skills across five dimensions: content, organization, grammar, vocabulary, and mechanics. This standardized rubric was used to mark a descriptive essay consisting an introduction, a body, and a conclusion.

RESULTS AND DISCUSSION

Problem 1: What is the level of the participants' collaborative writing engagement?

Table 1 shows the overall results for the level collaborative writing engagement among the participants. The data show that the participants were engaging in collaborative writing at a high level, with a mean score of *3.85* where 58 out of 114 participants *(51%*) reported that they often engage in collaboration. Additionally, *29%* said "sometimes," *17%* answered "always", *3.5%* said "rarely," while none said "never." The subsequent tables present the specific indicators presented to the participants to determine their level of collaborative engagement.

Table 1 Collaborative Writing Engagement

Range	Description	Interpretation	Frequency	Percentage
4.51 – 5.00	Always	Very High	19.00	16.67
3.51 – 4.50	Often	High	58.00	50.88
2.51 – 3.50	Sometimes	Moderate	33.00	28.95
1.51 – 2.50	Rarely	Low	4.00	3.51
1.00 – 1.50	Never	Very Low	0.00	0.00
Total			**114**	**100.0**
Mean			**3.85**	
Interpretation			**High**	
SD			**0.66**	

Thus, the results demonstrate the different collaborative writing they engaged in. This implies that the majority of the students were involved in the process and practiced collaborative writing across various types of writing activities. Alwahoub et al. (2022) focused on interaction, shared drafting, and peer feedback as an approach to learning. Through collaborative writing and commenting on drafts, students can practice their organization skills, make their arguments clear, and correct language in a way that can be easily viewed and edited.

Problem 2. What are the participants' self-reports on their emotional regulation during writing?

Table 2 presents the participants' self-reports on their emotional self-regulation during writing.

Table 2 Emotional Regulation

Range	Description	Interpretation	Frequency	Percentage
4.51 – 5.00	Always	Very High	31.00	27.19
3.51 – 4.50	Often	High	57.00	50.00
2.51 – 3.50	Sometimes	Moderate	24.00	21.05
1.51 – 2.50	Rarely	Low	2.00	1.75
1.00 – 1.50	Never	Very Low	0.00	0.00
Total			**114**	**100.0**
Mean			**3.97**	
Interpretation			**High**	
SD			**0.71**	

The data uncovered the way participants cope with their emotions when writing. It was reported that they demonstrate a strong self-regulation strategy while writing, with the indicators falling within the high range with an overall mean of 3.97. The participants practiced different kinds of techniques to keep them engaged during the entire writing process even when facing difficulties along the way. Techniques like thinking about how to improve their writing skills and staying motivated by future benefits scored the highest, with a mean of

4.11. Sehlström et al. (2023) examined self-efficacy in writing and written text quality among learners at the upper secondary level, including comparisons that considered reading profiles and writing in other languages.

Problem 3. What is the extent of the participants' use of AI-assisted tools?

The result indicated that participants' overall level of AI tool usage in their writing processes is quite high with a mean of 3.51. In particular, 8.77% of the participants reported a "very high" level of usage, and almost half (51.75%) reported a "high" level of usage.

Table 3 AI-Assisted Tools Use

Range	Description	Interpretation	Frequency	Percentage
4.51 – 5.00	Always	Very High	10.00	8.77
3.51 – 4.50	Often	High	59.00	51.75
2.51 – 3.50	Sometimes	Moderate	33.00	28.95
1.51 – 2.50	Rarely	Low	11.00	9.65
1.00 – 1.50	Never	Very Low	1.00	0.88
Total			**114**	**100.0**
Mean			**3.51**	
Interpretation			**High**	
SD			**0.78**	

Furthermore, a total of 28.95% answered "sometimes," while 9.65% (11 out of 114) reported a low level.

Although 1% reported "never," the overall result indicate that most participants are integrating technology into their writing. For instance, the indicator considering AI tools to paraphrase sentences for better clarity garnered a mean of 3.86 (*M=3.86*). This suggests that AI technologies are gaining importance in the different phases of the writing process as they

assist students from brainstorming up to finalizing their drafts. In relation to this, Mai et al. (2024) stated that ChatGPT is mainly applied in writing-related assistance, including brainstorming, outlining, restating, and feedback. This conforms to artificial intelligence-aided tool usage construct because students often utilize these tools to reduce the challenges of drafting and revising.

Problem 4. What is the level of the participants' writing skills in terms of: content; organization; grammar; vocabulary; and mechanics?

Table 4 shows the level of the participants' writing skills specifically in the following areas: content, organization, grammar, vocabulary, and mechanics.

Table 4 Summary of Writing Skills

Writing Skills	Mean	SD	Interpretation
Content	3.29	0.48	Moderate
Organization	3.06	0.52	Moderate
Grammar	3.01	0.48	Moderate
Vocabulary	3.34	0.53	Moderate
Mechanics	2.75	0.61	Moderate
Overall Writing Skills	**3.09**	**0.43**	**Moderate**

The overall writing skills of the participants in the areas of content, paragraph structure, grammar, vocabulary and mechanics yielded a total mean of *3.09*. This places their overall performance at a moderate level, which was indicative of a satisfactory degree of general writing skills among the participants. The general findings indicate that while most participants can write succinctly and effectively, the quality of their writing is not fully refined. Bin Dahmash (2025) delves into the advantages of applying analytic rubrics in writing classes for students. This matters for the outcome variable because the writing skills rubric includes content, organization, grammar, vocabulary, and mechanics. By being aware of these categories, students will be able to revise their work with more specific aims, including deepening the topic development, enhancing paragraph coherence, and eliminating grammatical errors.

Problem 5. Do the participants' collaborative writing engagement, emotional regulation during writing, and use of AI-assisted tools significantly influence their writing skills?

$H0_1$: Collaborative writing engagement, self-regulation, and use of AI-assisted tools are not significantly associated with the writing skills of Grade 11 students.

$H0_2$: There is no significant relationship between collaborative writing engagement and writing skills of Grade 11 students.

$H0_3$: There is no significant relationship between emotional regulation during writing and writing skills of Grade 11 students.

$H0_4$: There is no significant relationship between the use of AI-assisted tools and writing skills of Grade 11 students.

Table 5 presents the regression analysis of the influence of collaborative writing engagement, self-regulation in writing, and AI-assisted tools on the participants' writing skills. The data revealed that the whole model is significant,$F(3,110) = 7.101$, $p = <.001$. Thus, the first null hypothesis is rejected, implying that collaborative

writing engagement, self- regulation, and use of AI-assisted tools collectively contribute to the writing skills of Grade 11 students. Moreover, 16.2% of the variability in the participants' writing skills can be accounted for by the combination of collaborative writing engagement, the use of AI-assisted tools and self-regulation in writing.

Table 5 Influence of Collaborative Writing Engagement, Self-Regulation in Writing, and AI-Assisted Tools on Writing Skills

Predictor	Unstandardized Coefficients		β	t	p
	B	SE			
Constant	1.840	.285		6.455	.000
Collaborative Writing Engagement	.166**	.062	.253	2.680	.008
AI-Assisted Tools	.123*	.051	.221	2.432	.017
Self-Regulation	.045	.058	.074	.774	.441
Model Summary					
$R = 0.403$ $R^2 = 0.162$ Adj. $R^2 = 0.139$ $F(3,110) = 7.101$ $p =<.001$					
Note. B = unstandardized beta coefficient, SE = standard error, β = standardized beta coefficient, t = t statistic, p = probability value. **significant at 0.05 level; *significant at 0.05 level					

The remaining 83.8% may be attributed to other factors and approaches not covered in this study, such as the process approach which is effective in improving writing skills and reducing anxiety. Helaluddin et al. (2023) showed that collaborative writing can strengthen writing performance when learners are guided to work together meaningfully, and their qualitative evidence supported the idea that collaboration can change how learners perceive writing tasks and their own capabilities.

Moreover, Chau et al. (2025) also found that emotional regulation may support students' confidence, persistence, and coping during writing tasks, but it should not be assumed to be an automatic predictor of writing skills, since its influence may depend on other factors such as writing proficiency, feedback quality, instructional support, and the specific writing dimension being measured. Likewise, Mai et al. (2024) stated that ChatGPT is mainly applied in writing-related assistance, including brainstorming, outlining, restating, and feedback. This conforms to the artificial intelligence-aided tool usage construct because students often utilize these tools to reduce the challenges of drafting and revising.

CONCLUSIONS

Based on the findings of the study, the participants demonstrated high levels of collaborative writing engagement, self-regulation and the use of AI-assisted tools in their writing. They actively participated in exchange of ideas, group projects refinements, creating a powerful teamwork and learning environment. Furthermore, the study highlights the importance of acknowledging emotional regulation as a critical component of writing engagement alongside effort and collaboration. In terms of technology integration, the participants found AI tools to be highly helpful, particularly for paraphrasing sentences and generating ideas.

Conversely, the participants demonstrated a moderate level of proficiency in their writing skills across content, organization, grammar,vocabulary and mechanics, indicating that many are still developing their writing abilities in in-depth discussion and textual refinement. Overall, the result of this study shows that collaborative writing engagement and the use of AI tools are significant predictors of students' writing skills, indicating that these that these two variables directly contribute to the development of text quality. Although self-regulation was found a negligible predictive effect on writing skills in this context, this may be attributed to the possibility that the participants have not yet fully developed or independently applied self-regulation strategies during independent drafting. These conclusions align with the Cognitive Process Theory by Flower and Hayes, which describes writing as a set of distinctive thinking processes that writers orchestrate during the composition, as well as the framework of McLean et al. (2022), who highlighted that writing development is a continuum across multiple interrelated domains, including idea development, organization, language use, and following conventions.

RECOMMENDATIONS

To shed light on the findings and conclusions of the study, the researcher presented the following recommendations: 1) For English teachers, that they may expose students to different writing activities that will allow them to organize their ideas first prior to drafting and revising and introduce effective writing strategies like RACE and Jigsaw Techniques so that they can write a good written output without relying to their peers. 2) For administrators, that they may include Writing Skills Development training in In-service Training (INSET) as part of the faculty development training for Language Teachers. 3) For future researchers, that they conduct a thorough study on Collaborative Writing engagement, Use of AI- Assisted tool and Self-Regulation as predictors of writing skills of students in Northern Mindanao.

Compliance with Ethical Standards

This study was approved and issued ethical clearance by the Lourdes College-Research Ethics Committee (LC-REC). This study followed ethical standards based on the Belmont Report, ensuring fair participant selection, informed consent, and voluntary participation. Grade 11 learners were carefully identified with the help of advisers, and data collection was scheduled without disrupting classes. Participants were clearly informed about the study and completed questionnaires independently, with guidance available when needed. They also written their essay on a specific given time without a rush. Strict confidentiality was maintained throughout, with secure storage of data and no disclosure of personal information. Overall, the research process ensured accuracy while protecting the rights, privacy, and safety of all participants.

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