

Original Article

## **Effectiveness of a Web-Based Writing Intervention in Enhancing Elementary Students' Composition Skills: A Sequential Explanatory Mixed-Methods Study**

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### **Abstract**

This study examined the effectiveness of a one-week web-based learning intervention on Grade 6 pupils' composition writing in a face-to-face classroom. Using a sequential explanatory mixed-methods design, thirty pupils participated in scaffolded digital lessons targeting main idea, supporting detail, spelling, grammar, organization, and punctuation. Paired samples t-test results showed a significant improvement in overall writing performance ( $M_{pre} = 2.66$ ,  $SD = 0.75$ ;  $M_{post} = 3.30$ ,  $SD = 0.63$ ;  $t(29) = 15.44$ ,  $p < .001$ ), with the largest gains observed in spelling and supporting detail. Shapiro-Wilk results indicated normal distribution ( $p > .05$ ). Thematic analysis further revealed increased engagement, confidence, and motivation among students. However, these findings should be interpreted with caution, as they reflect short-term outcomes from a small, purposively selected sample within a single classroom context. As such, the results are context-specific and cannot be generalized to other educational settings without further validation through larger and more diverse studies. Overall, the findings suggest that structured web-based instruction may serve as a promising approach for supporting writing development in blended elementary classrooms.

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## **1. Introduction**

Writing proficiency constitutes a fundamental academic competency that supports cognitive development, analytical reasoning, and effective communication across disciplines. At the elementary level, composition writing requires learners to construct coherent texts by articulating a clear main idea, developing supporting details, applying grammatical conventions, organizing content logically, and using appropriate punctuation. Mastery of these interconnected skills establishes the foundation for advanced literacy and academic achievement. Consequently, strengthening writing proficiency remains a priority in contemporary educational research and instructional practice.

Recent scholarship highlights the growing role of digital technologies in enhancing writing instruction. Web-based learning environments have been shown to improve idea generation, structural organization, spelling accuracy, grammatical precision, and learner motivation. Graham et al. (2012) reported that digital instructional tools enhance students' ability to identify main ideas and supporting details. Li et al. (2017) found that web-based platforms promote critical thinking in writing tasks, while Wilson and Czik (2016) demonstrated improvements in spelling and punctuation through scaffolded digital feedback. Similarly, De Smedt et al. (2018) observed gains in organizational coherence among students exposed to structured online writing supports. These findings collectively suggest that web-based instructional approaches offer promising means to strengthen elementary writing competencies.

Despite this growing body of evidence, much of the existing research has examined fully online, asynchronous, or higher education contexts. Few empirical investigations have examined how structured web-based interventions function when deliberately integrated into traditional face-to-face classroom instruction at the elementary level. Additionally, many studies focus on general writing improvement without systematically analyzing specific writing components such as main idea, supporting detail, spelling, grammar, organization, and punctuation within a unified intervention framework. The absence of component-level analysis within blended instructional settings limits understanding of how targeted digital scaffolding influences distinct dimensions of writing proficiency.

Moreover, while technology integration is frequently advocated as a solution to improve literacy outcomes, limited research has examined short-term, structured interventions that combine pedagogical sequencing with interactive digital supports under teacher supervision. Clarifying whether measurable gains can occur within a brief intervention period contributes important insight into instructional efficiency and practical classroom application. Addressing this gap is necessary to determine whether web-based tools function as effective complements rather than substitutes for direct instruction in elementary writing education.

To address these limitations, this study investigates the effectiveness of a structured web-based writing intervention integrated within a face-to-face Grade 6

classroom. Specifically, the study examines (1) pupils' writing proficiency across six domains before and after the intervention, (2) whether statistically significant differences exist between pretest and posttest scores, and (3) pupils' lived experiences during the intervention. It is hypothesized that there is no significant difference between pretest and posttest writing scores; this hypothesis is tested using a paired-samples statistical analysis.

The study is grounded in the Community of Inquiry framework by Garrison et al. (2000), which emphasizes cognitive, social, and teaching presence in digitally supported learning environments. Constructivist principles support learner interaction and meaning-making, while Objectivist perspectives reinforce structured sequencing and skill reinforcement. Integrating these complementary frameworks provides both interactive engagement and systematic progression within the intervention design.

By examining the effectiveness of a web-based writing intervention embedded in face-to-face instruction, this study contributes empirical evidence to the discourse on blended literacy pedagogy. The findings aim to inform instructional design practices, support data-driven curriculum enhancement, and advance evidence-based integration of digital tools in elementary education. In doing so, the research aligns with broader efforts to promote inclusive and high-quality learning opportunities through pedagogically grounded technological innovation and elementary writing proficiency in digitally integrated classroom environments.

## **2. Methodology**

This study used a sequential explanatory mixed-methods design, where quantitative data were collected and analyzed first, followed by qualitative data to help explain the results. The quantitative part used a one-group pretest–posttest design to examine short-term changes in students' writing skills following a structured web-based writing intervention. However, since there was no control group, the study does not claim that the improvements were caused only by the intervention, and the results are presented as initial or preliminary findings. In addition, the intervention was conducted over a short period of one week with only three sessions, so it is treated as a pilot implementation rather than a long-term measure of writing development. The qualitative part involved focus group discussions to understand students' experiences and provide deeper meaning to the numerical results. This design was chosen because writing development is not only seen in scores but also in how students experience and engage with the learning process, especially within a limited timeframe.

The study was conducted at a private sectarian elementary school in Cebu City, Philippines. The intervention and data collection were completed within a one-week implementation period, consisting of a pretest session, three structured web-based instructional sessions delivered during classroom time, a posttest session, and qualitative data collection. The participants were 30 elementary students aged 11–12 years who were enrolled at the time of data collection. The class represented a heterogeneous group including male and female students. Participants were selected

through purposive sampling, in which one intact class was selected as the intervention group based on predefined criteria aligned with the study's objectives. Inclusion criteria required that students be officially enrolled and aged 11–12 years during the study period. Students who were not officially enrolled or aged 10 years or below were excluded.

A researcher-developed writing task was administered as both the pretest and posttest. Students were required to produce a written composition based on a prompt aligned with elementary writing expectations. Writing outputs were evaluated using a holistic scoring rubric that assessed six domains: main idea, supporting detail, spelling, grammar (grammaticality), organization, and punctuation. Prior to implementation, the researcher-developed evaluation instrument and rubric underwent expert validation by three department heads in English and language instruction, who examined the alignment of the writing prompt and scoring criteria with curricular standards and expected writing competencies. Content and face validity were established through professional review and recommendations, which were incorporated prior to final administration.

To enhance scoring consistency and reduce individual rater bias, five English teachers independently evaluated the anonymized writing outputs using a common rubric. Prior to scoring, the raters underwent an orientation on the rubric criteria and scoring procedures to promote a shared understanding and ensure more consistent interpretation. Scores for each writing domain were averaged to obtain the final score for each student. While the use of multiple raters helped promote objectivity, inter-rater reliability statistics (e.g., intraclass correlation coefficient or kappa) were not computed in this study. Nonetheless, efforts such as rater orientation and standardized scoring procedures were implemented to minimize rating variability.

Following the pretest, students participated in a one-week web-based writing intervention delivered during face-to-face classroom instruction using a web-based learning platform. The intervention incorporated multimedia lessons, scaffolded writing prompts, structured practice tasks, and immediate feedback mechanisms designed to strengthen the six identified writing domains. Teacher guidance was provided throughout implementation to clarify instructions, monitor participation, and ensure consistent instructional delivery. The intervention sequence included a pretest on the first day; focused instruction on the main idea and supporting details on the second day; instruction on spelling, grammar accuracy, and punctuation on the third day; instruction on organization and coherence on the fourth day; and posttest administration followed by focus group discussions on the fifth day. Classroom routines and instructional time allocations were maintained consistently throughout the intervention to minimize extraneous instructional variation.

After completion of the intervention, students completed the posttest writing assessment. The students' compositions were evaluated using an analytic writing rubric consisting of six domains: content, organization, vocabulary, grammar, coherence, and mechanics. Each domain was rated using a 4-point scale. The scores were interpreted as follows:

- 1.00–1.75 – Beginning
- 1.76–2.50 – Developing
- 2.51–3.25 – Proficient
- 3.26–4.00 – Advanced

The overall writing score was computed by averaging the ratings across all domains. These scale ranges were used to guide the qualitative interpretation of students' writing performance.

Writing outputs were anonymized using numeric codes before evaluation. Focus group discussions were conducted after the posttest to gather students' reflections on their engagement, perceived learning gains, challenges encountered, and perceptions of feedback during the web-based learning activities. A semi-structured interview guide with open-ended prompts facilitated these discussions.

The institutional research ethics review committee granted ethical approval for the study. Because the participants were minors, informed consent from a parent or guardian and student assent were obtained prior to data collection. Participation was voluntary, and students were informed of their right to withdraw at any time without penalty. Confidentiality was maintained by replacing student names with numeric codes and restricting access to raw data to the researcher. Findings were reported in aggregated form to ensure anonymity.

Quantitative data were analyzed using IBM SPSS Statistics. Descriptive statistics, including means and standard deviations, were computed for pretest and posttest scores across the six writing domains. The assumption of normality was examined using the Shapiro–Wilk test. A paired samples t-test was conducted to determine whether there was a statistically significant difference between pretest and posttest scores. Statistical significance was evaluated at an alpha level of 0.05. Qualitative data from the focus group discussions were analyzed using thematic analysis, involving transcription, coding, identification of recurring patterns, and consolidation into themes and subthemes. The qualitative findings were used to explain and contextualize the quantitative results within the sequential explanatory mixed-methods design.

### **3. Results**

#### *3.1 Pre-Intervention Writing Proficiency*

Prior to the web-based intervention, students obtained an overall mean score of 2.66 (SD = 0.75), which falls within the Developing level based on the rubric scale. As shown in Table 1, most writing components were within the Developing range, including main idea (M = 2.67), supporting detail (M = 2.73), grammar (M = 2.67), and punctuation (M = 2.63). Spelling (M = 2.97) approached the Proficient level, while organization (M = 2.30) remained at the lower end of the Developing range. These findings indicate that, before the intervention, students demonstrated emerging

writing skills but still required support in structuring ideas, particularly in organization.

**Table 1.** Composition writing scores before the intervention (N=30).

Components	Mean	SD	Interpretation
Main Idea	2.67	0.8442	Proficient
Supporting Detail	2.73	0.7849	Proficient
Correct Spelling	2.97	0.7184	Proficient
Accuracy of Grammar	2.67	0.6065	Proficient
Organization	2.30	1.0554	Developing
Punctuation Marks	2.63	0.4901	Proficient
Average	2.66	0.7499	Proficient

### 3.2 Post-Intervention Writing Proficiency

After the web-based intervention, the overall mean score increased to 3.30 (SD = 0.63), corresponding to the Advanced level on the rubric scale. As presented in Table 2, improvements were observed across all writing components. Main idea (M = 3.40), supporting detail (M = 3.43), spelling (M = 3.83), and punctuation (M = 3.17) reached the Advanced level, while grammar (M = 3.03) and organization (M = 2.93) remained within the Proficient range. These results suggest a shift from developing to higher levels of writing performance following the intervention.

**Table 2.** Composition writing scores after the intervention (N=30).

Components	Mean	SD	Interpretation
Main Idea	3.40	0.66332	Advanced
Supporting Detail	3.43	0.61554	Advanced
Correct Spelling	3.83	0.45338	Advanced
Accuracy of Grammar	3.03	0.54671	Proficient
Organization	2.93	0.81377	Proficient
Punctuation Marks	3.17	0.68718	Advanced
Average	3.30	0.62998	Advanced

### 3.3 Difference Between Pretest and Posttest Scores

Table 3 shows the differences between pretest and posttest scores across writing components. The overall mean increase was +0.73, indicating consistent improvement in all domains. Spelling showed the highest gain (+0.86), followed by main idea (+0.73), supporting detail (+0.70), organization (+0.63), punctuation (+0.54), and grammar (+0.36). These results indicate that while all areas improved, gains were more pronounced in the surface-level and idea development components than in grammar.

**Table 3.** Test difference between pretest and posttest (N=30).

Components	Pretest Average	Posttest Average	Difference
Main Idea	2.67	3.40	.73
Supporting Detail	2.73	3.43	.70
Correct Spelling	2.97	3.83	.86
Accuracy of Grammar	2.67	3.03	.36
Organization	2.30	2.93	.63
Punctuation Marks	2.63	3.17	.54
Average	2.66	3.30	.73

### 3.4 Hypothesis Testing

A paired-samples t-test was conducted to examine whether there was a significant difference between pretest and posttest writing scores. Results showed a statistically significant improvement in students’ performance after the intervention,  $t(29) = 15.44, p < .001$ . The mean difference between posttest and pretest scores was 1.91 (SD = 0.33, SE = 0.12), with a 95% confidence interval ranging from 1.61 to 2.21. These results indicate that posttest scores were significantly higher than pretest scores. However, given the one-group pretest–posttest design and short duration of the intervention, these findings should be interpreted as evidence of short-term improvement rather than definitive causal impact.

**Table 4.** Hypothesis testing using paired samples t-test.

Pair	Mean Difference	SD	SE	95% CI for Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>	Decision
Posttest–Pretest	1.91	0.33	0.12	[1.61, 2.21]	15.44	6	< .001	Reject null hypothesis

### 3.5 Qualitative Findings

Four major themes emerged from focus group discussions:

- Fun and Engaging Learning Experience
- Improvement of Composition Writing Skill
- Balance of Online and In-Person Activities
- Motivation to Participate and Learn

Students described the web-based intervention as enjoyable and engaging, particularly due to its interactive features and multimedia elements. One student shared, “*Fun kaayo kay naay animations ug activities—murag nagdula pero nakat-on ko.*” Another participant noted, “*Nalingaw ko kay makakita dayon ko sa akong sayop ug ma-correct nako.*” These experiences suggest that engagement played a key role in sustaining students’ participation during the intervention.

Students also reported improvements in their writing skills, particularly in organization, punctuation, and clarity of ideas. One participant explained, “*Sa una,*

*bati akong writing, walay klaro, pero karon mas kabalo nako mag-organize sa akong ideas.*” Another student added, *“Nakat-on ko unsaon paggamit sa punctuation ug capitalization.”* These responses support the quantitative findings, particularly the observed gains in organization and mechanics.

In terms of instructional approach, students highlighted the importance of balancing online and face-to-face learning. A participant shared, *“Mas maayo kung naay online ug teacher kay mas masabtan nako ug tarong.”* This indicates that the combination of digital tools and teacher guidance contributed to better understanding and learning.

Students also expressed increased confidence and motivation in writing. One student stated, *“Mas confident na ko magsulat kay kabalo nako unsa akong sayop ug unsaon pag-improve.”* Another added, *“Happy ko kay na-improve akong writing ug makatabang ni sa future.”* These responses suggest that the intervention not only improved skills but also positively influenced students’ attitudes toward writing.

Despite these positive experiences, some challenges were also reported. Students mentioned difficulties in grammar and structuring ideas, as well as occasional screen fatigue. These insights indicate that, while the intervention was beneficial, certain aspects of writing development may require longer, more sustained instructional support.

#### **4. Discussion**

The findings demonstrate that the web-based intervention significantly enhanced elementary students' composition writing skills across all measured components. These results reinforce the growing recognition that structured, data-informed instructional approaches can meaningfully improve learner outcomes.

The moderate baseline performance observed in the pretest aligns with Graham et al. (2012), who reported similar foundational writing competencies among elementary learners. Organization emerged as the weakest pre-intervention component, consistent with Zheng et al.'s (2015) findings that students often require explicit instruction in structuring ideas coherently. The interdependence of literacy skills suggests that structural weaknesses in writing may be rooted in deeper comprehension processes.

Post-intervention improvements support the growing body of evidence indicating that web-based writing instruction enhances writing proficiency. The significant gains in main idea and supporting details are consistent with Bouwer et al. (2018), who found that digital writing platforms improve students' ability to articulate central ideas clearly. The improvement in supporting details aligns with Philippakos and MacArthur (2016), suggesting that structured digital scaffolding strengthens elaboration skills.

Spelling demonstrated the largest improvement (+0.86), supporting Cordewener et al. (2016) findings that web-based spelling programs significantly enhance orthographic accuracy. The consistency of posttest scores (low SD) further indicates stable skill acquisition across participants.

Grammar showed the smallest gain (+0.36), which aligns with Myhill et al. (2012), who noted that grammar development requires sustained reinforcement beyond short-term interventions. This suggests that while web-based instruction contributes to grammatical accuracy, it may require extended implementation for maximal impact.

The improvement in organization (+0.63) supports Zumbrunn et al. (2016), who emphasized the effectiveness of digital writing platforms in enhancing structural coherence.

The significant paired-samples t-test result corroborates Zheng et al. (2015), a meta-analysis of 27 studies, which concluded that computer-based writing instruction consistently produces statistically significant improvements across age groups. Likewise, Wijekumar et al. (2022) found that interactive digital environments enhance written proficiency through collaborative and feedback-rich features.

Qualitative findings further reinforce these quantitative results. Students' enjoyment and motivation reflect Pekrun et al.'s (2011) work on positive academic emotions. Increased confidence aligns with Zumbrunn et al. (2016) and Graham et al. (2012), who reported gains in writing self-efficacy following technology-supported instruction. The reported balance between online and face-to-face activities supports Mayer's (2021) multimedia learning theory and Hrastinski's (2019) blended learning framework.

Challenges related to grammar, creativity, and screen fatigue align with Muhammad et al. (2022), indicating that while digital tools are effective, thoughtful implementation and instructional balance remain essential.

Overall, the convergence of quantitative significance and qualitative validation provides strong evidence that structured web-based interventions can enhance elementary students' writing proficiency in face-to-face settings.

## **5. Conclusion**

This study examined the use of a web-based learning intervention to support Grade 6 pupils' composition writing within a face-to-face classroom setting. The findings indicate that students demonstrated short-term improvements across key writing components, including main idea, supporting details, spelling, grammar, organization, and punctuation. These improvements, supported by both quantitative results and students' reported experiences, suggest that structured web-based instruction can enhance writing performance within the given classroom context.

Beyond the observed gains, the results highlight the potential of technology-supported learning environments to strengthen both foundational and higher-order writing skills. Students reported increased engagement, confidence, and motivation, suggesting that interactive digital tools may support more active participation in the writing process. The integration of web-based activities with face-to-face instruction also reinforces the value of blended learning approaches in promoting meaningful learning experiences.

However, these findings should be interpreted with caution. The study was conducted with a small, purposively selected sample from a single classroom and lasted a short time. As such, the results are context-specific and cannot be generalized to other educational settings without further empirical validation. The absence of a control group further limits the ability to attribute improvements solely to the intervention. Additionally, although multiple raters and scoring orientations were employed to promote consistency, inter-rater reliability statistics were not computed, which may affect the scoring process's precision.

For practitioners, the findings suggest that integrating structured web-based exercises, immediate feedback mechanisms, and multimedia resources into writing instruction may support student learning when combined with explicit teaching and guided practice. However, particular attention should be given to areas such as grammar development, which may require longer and more sustained instructional support.

Future research is recommended to employ more rigorous designs, such as experimental or quasi-experimental approaches, to establish causal relationships better. Longitudinal studies may also help determine whether improvements in writing performance can be sustained over time. Expanding the study across diverse learner groups and educational contexts will further strengthen the validity and applicability of findings.

In conclusion, this study provides preliminary evidence that web-based writing interventions may support the development of composition skills among elementary learners in blended classroom environments. While promising, these findings should be viewed as exploratory and context-bound, highlighting the need for continued investigation into the role of technology in writing instruction.

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## **Conflict of Interest Statement**

The author declares that there are no financial or non-financial conflicts of interest related to this study. The author has no employment, consultancy, stock ownership, honoraria, paid expert testimony, patent applications, or other financial relationships with organizations that could potentially influence the interpretation of the findings. Furthermore, there are no personal relationships, professional affiliations, or organizational memberships that may be perceived as creating bias or dual loyalty in relation to this research.

All conclusions presented in this manuscript were derived independently based on the data collected and analyzed. The author affirms that the study was conducted with full academic integrity and transparency.

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