

ENHANCING HIGH SCHOOL STUDENTS' WRITING SKILLS USING QUILLBOT AS A GRAMMAR CORRECTION TOOL

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Abstract

This study examines the effectiveness of QuillBot, an AI-based grammar correction tool, in improving the writing proficiency of 11th-grade students in analytical exposition texts. Using a quasi-experimental design, the research involved two classes: an experimental group that used QuillBot during writing instruction and a control group that received traditional instruction. Students' writing performance was assessed using pre- and post-tests scored with a rubric adapted from Brown and Bailey (1984). The results showed that the experimental group demonstrated significant improvement in writing proficiency, particularly in grammar accuracy, with a statistically large effect size ($r = 0.69$). These findings indicate the potential of AI-supported tools to enhance writing instruction in secondary education.

Keywords: *writing skills; grammar correction; exposition text; AI tools; QuillBot*

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INTRODUCTION

Writing is a fundamental component of English education because it enables students to organize ideas, construct arguments, and communicate effectively in academic and professional settings. At the high school level, students are required to master exposition texts, particularly analytical exposition, which demand logical structure, grammatical accuracy, and coherent argumentation. However, many students struggle with grammar, sentence structure, and clarity of expression, which often hinders their ability to produce well-developed texts.

To address these challenges, recent studies have examined the integration of technology into writing instruction, including AI-powered applications designed to assist with revision and editing. One such tool is QuillBot, which provides real-time automated feedback on linguistic accuracy. While previous research, such as Fitria (2021) and Nurmayanti and Suryadi (2023), has explored QuillBot's use in paraphrasing and general writing enhancement, fewer studies have investigated its effectiveness in improving grammar accuracy and coherence specifically in analytical exposition texts at the high school level. This gap highlights the need for research that focuses on how AI-based feedback supports students' writing development in academic genres.

The present study is grounded in several theoretical frameworks. Writing theory (Graham & Perin, 2007) emphasizes the importance of explicit feedback and revision opportunities. The process writing approach (Emig, 1977) views writing as a recursive cycle that includes drafting, reviewing, and editing. From a constructivist perspective (Bikowski & Vithanage, 2016), learners build knowledge through active engagement, reflection, and problem-solving. AI feedback aligns with this perspective because it enables students to interact directly with their errors, evaluate suggested corrections, and make independent revision decisions—thereby fostering autonomy and deeper learning rather than passive correction.

In response to the identified gap, this study investigates the impact of using QuillBot to support students' revision processes when composing analytical exposition texts.

Based on this background, the study aims to investigate:

1. whether QuillBot improves the overall writing proficiency of 11th-grade students, and
2. the extent to which QuillBot enhances grammar accuracy in their analytical exposition texts.

These aims reflect the broader goal of comparing the writing performance of students who use QuillBot with those who receive traditional instruction.

METHOD

Research Design

This study employed a quantitative approach using a quasi-experimental design to evaluate the effectiveness of QuillBot in improving students' writing proficiency in analytical exposition texts. A pre-test-post-test structure was implemented to measure students' performance before and after the treatment.

Participants

The participants were 63 11th-grade students from a public senior high school in Surabaya, Indonesia. Two intact classes were selected through intact group sampling. This sampling method was chosen because the school did not permit the random reassignment of students to different classes, making randomization impractical. Consequently, one class ($n = 33$) served as the experimental group that used QuillBot during writing instruction, while the other class ($n = 30$) served as the control group and received traditional instruction without technological assistance.

Instruments

The primary instrument was a writing test designed to assess students' analytical exposition skills. The test measured five aspects of writing: organization, content, grammar, punctuation and spelling, and vocabulary. The scoring rubric was adapted from Brown and Bailey (1984), with modifications to emphasize grammar accuracy in line with the study's objectives. To ensure content validity, the instrument was reviewed by the thesis advisor.

Inter-rater reliability was established by having two independent raters score a subset of the writing samples. Their scores were compared to ensure consistency, and discrepancies were discussed to refine the scoring procedure. This step helped ensure that the assessment reflected stable and reliable measurement of students' writing ability.

Data Collection

The study was conducted over three instructional meetings, each lasting approximately 90 minutes. Both groups completed a pre-test at the beginning of the study and a post-test after the treatment period, using the same writing prompts and scoring rubric.

In the experimental group, students were guided to revise their drafts using QuillBot. During the writing sessions, students first wrote an initial draft, then used QuillBot for approximately 20-25 minutes to review grammar, check clarity, and make revisions based on AI-generated feedback. The teacher assisted students in interpreting the feedback and making appropriate edits.

In the control group, students completed the same writing tasks but followed traditional instruction, which included teacher explanation, peer discussion, and manual revision without technological tools.

Data Analysis

Students' pre-test and post-test scores were analyzed using SPSS. Normality (Shapiro-Wilk) and homogeneity (Levene's Test) checks indicated that the data did not meet parametric assumptions. Therefore, the Mann-Whitney U Test was used to compare post-test scores between the experimental and control groups. Effect size (r) was calculated to determine the practical significance of the findings.

Descriptive statistics were also reported to provide a clearer overview of student performance. The experimental group's post-test scores showed a higher mean and lower standard deviation compared to the control group, indicating both improved performance and greater consistency in writing outcomes.

RESULT AND DISCUSSION

The analysis began with testing statistical assumptions. The Shapiro-Wilk results showed that the experimental group's post-test scores did not follow a normal distribution ($p < .05$), while the remaining scores met normality assumptions (see Table 1). Homogeneity of variance was also violated, as indicated by Levene's Test ($p = .025$; Table 2). Since the data were non-normal and variances were unequal, the Mann-Whitney U Test was used to compare post-test performance between groups.

Table 1 Normality Test Result

Group	Test Type	Statistic	df	Sig.
Experimental	Pre-test	.945	33	.092
Experimental	Post-test	.783	33	.000
Control	Pre-test	.933	30	.059
Control	Post-test	.979	30	.797
Levene Statistic		df1	df2	Sig.
5.255		1	61	.025

*Table 2
Homogeneity Test Result*

The descriptive results showed a notable improvement in the experimental group, with the mean score rising from 74.33 to 91.79, whereas the control group's average slightly decreased from 67.40 to 66.27. The Mann-Whitney U Test confirmed a statistically significant difference between the two groups ($U = 96.500$, $Z = -5.512$, $p < .001$), indicating that students who used QuillBot performed significantly better on the post-test (Table 3).

Table 3 Mann-Whitney U Test of Post-test Scores

Group	N	Mean	Sum of Ranks	U	Z	Sig. (2-tailed)
Experimental	33	44.08	1454.50	96.500	-5.512	.000
Control	30	18.72	561.50			

The effect size, calculated using $r = Z / \sqrt{N}$, yielded $r = 0.694$, which is categorized as a large effect (Pallant, 2016). This suggests that QuillBot had substantial practical impact, not only statistical significance (Table 4).

Table 4 Effect Size of Mann-Whitney U Test

Comparison	Z value	N	Effect Size (r)	Effect Interpretation	Size
Experimental vs Control (Post-test)	-5.512	63	0.694	Large effect	

The significant improvement in the experimental group’s scores can be explained by the immediate feedback provided by QuillBot. The tool helped students notice their mistakes quickly and correct them during revision. This direct feedback made it easier for students to understand which parts of their writing needed improvement. Similar results were also reported in previous studies (Fitria, 2021; Nurmayanti & Suryadi, 2023; Laila & Daulay, 2024), which found that AI tools improved grammar accuracy and writing clarity.

The large effect size ($r = .694$) shows that QuillBot had a strong influence on students’ writing performance. Because the tool automatically identified grammatical issues, students could focus more on developing their ideas, organizing their arguments, and improving the overall quality of their writing. This supports the idea from process writing theory (Emig, 1977), which states that writing improves when students revise their drafts with meaningful feedback.

Despite these benefits, the study also observed several challenges. Some students struggled to use the tool at first or relied too heavily on QuillBot’s suggestions without thinking carefully about the corrections. This suggests that teachers still play an important role in guiding students on how to use AI tools responsibly and critically. Another limitation is that the study used intact classes, which means the groups were not randomly assigned.

Overall, the findings show that QuillBot can be an effective support tool for improving students’ writing accuracy, especially when combined with teacher guidance.

CONCLUSION

This study found that QuillBot significantly improved students’ writing proficiency in analytical exposition texts. The experimental group outperformed the control group, and the tool’s real-time feedback helped students correct grammatical errors more effectively, contributing to clearer and more coherent writing. A key strength of this study is its focus on high school analytical exposition writing, an area that previous QuillBot research has rarely examined. This provides new insight into how AI feedback can support grammar-focused revision in a specific academic genre.

Although the results are promising, students still require teacher guidance to avoid excessive dependence on automated suggestions. The study was limited by its short duration and the use of intact classes. Future research should explore long-term use, different writing genres, and more diverse school settings. Overall, the findings suggest that AI-supported tools like QuillBot can play a meaningful role in secondary writing instruction when integrated thoughtfully into classroom practice.

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