THE IMPACT OF QUILLBOT, AN AI-POWERED WRITING TOOL, ON EFL STUDENTS' ARGUMENTATIVE ESSAY WRITING SKILLS

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Abstract: The integration of Artificial Intelligence (AI) in language learning has transformed academic writing, particularly in English as a Foreign Language (EFL) contexts. AI-powered writing tools such as QuillBot offer real-time feedback, automated paraphrasing, and grammatical enhancements, potentially improving students' writing proficiency. However, limited research explores the specific impact of QuillBot on argumentative essay writing in EFL classrooms. This study aims to examine the effectiveness of QuillBot in enhancing the writing skills of third-semester EFL students at Universitas Darma Persada, Indonesia. Using a quasi-experimental design, 60 students were divided into an experimental group (QuillBot-assisted learning) and a control group (traditional instruction). Pre-test and post-test essay scores were analyzed using SPSS 27.0 to assess improvements in structure, coherence, and grammar. The findings revealed that students using QuillBot showed significantly higher improvements in writing proficiency compared to those in the control group. The experimental group demonstrated enhanced argumentation, coherence, and grammatical accuracy, indicating that AI-assisted tools can be effective in fostering writing development. The study concludes that QuillBot is a valuable supplementary tool for EFL writing instruction, providing instant feedback and reducing students' dependency on traditional teacher-led corrections. Educators are encouraged to integrate AI writing assistants into teaching methodologies to optimize learning outcomes. Future research should explore the long-term effects of AI-assisted writing on different writing genres and across diverse educational contexts.
Keywords: *AI writing tools; QuillBot; EFL argumentative writing; writing proficiency; writing proficiency, technology-assisted learning.*

INTRODUCTION

The rapid advancement of artificial intelligence (AI) and digital tools has significantly transformed the teaching of writing in higher education. According to Haleem et al. (2022), AI-integrated platforms are reshaping traditional writing instruction into more interactive and engaging learning experiences. Garlinska et al. (2023) highlight the role of virtual classrooms, online workshops, and AI-powered tools, such as grammar checkers and paraphrasing software, in enhancing writing proficiency. These tools provide real-time feedback, collaborative editing, and plagiarism detection, fostering not only students' writing skills but also critical thinking and independent problem-solving (Nykyporets, 2023)."

Artificial Intelligence in Education (AIEd) has been a growing field since the 1990s, significantly influencing language learning and academic writing (Zawacki-Richter et al., 2019). In recent years, AI-powered writing tools have become increasingly popular in English as a Foreign Language (EFL) classrooms, assisting students with grammar, sentence structure, and content organization. Tools such as grammar checkers, AI-driven writing assistants, and automated paraphrasing software streamline the writing process, making it more efficient for both students and instructors (T. S. Chang et al., 2021; Gayed et al., 2022; Jeanjaroonsri, 2023; Zhao, 2022). These tools have proven particularly beneficial for EFL learners with limited English proficiency,

providing instant feedback that accelerates their writing development."

AI-powered writing tools provide comprehensive feedback on grammar, vocabulary, syntax, content, and structure (Hosseini et al., 2023; Strobl et al., 2019; Thorp, 2023). Using machine learning algorithms, these tools analyze student writing against vast linguistic databases, identifying errors and suggesting corrections. QuillBot, for example, offers real-time paraphrasing and grammatical enhancements, enabling EFL students to refine their writing more effectively (Akgun & Greenhow, 2022; Nazari et al., 2021; Rudolph et al., 2023). This instant, personalized feedback helps learners internalize fundamental writing principles, ultimately improving their writing competence."

As AI and natural language processing continue to evolve, writing tools such as QuillBot and Grammarly are becoming more sophisticated and widely accessible (Geitgey, 2018; Heaven, 2020). Many of these AI-powered platforms are freely available online, making them easily accessible for students seeking writing support (Kinden & Prentice, 2018; Rogerson & McCarthy, 2017). Given that today's students, often referred to as 'digital natives,' have grown up with technology, they naturally integrate AI tools into their academic writing process (Fithriani, 2021; Zulfa et al., 2023). These tools offer an effective solution for common writing challenges, particularly in paraphrasing, grammar correction, and content refinement.

According to Marzuki et al. (2023), AI writing tools used in EFL teaching have a significant impact on students' writing, particularly in content and organization. Their research highlights the strategies teachers employ to integrate tools like QuillBot, Jenni, Chat-GPT, WordTune, Copy.ai, Paperpal, and Essay Writer to address students' writing challenges. These tools foster a comprehensive learning environment and enhance students' overall academic performance.

QuillBot is an AI-powered web tool that helps students evaluate their writing by automatic paraphrasing, grammatical checking, translation, plagiarism checking, summarizing, and citation generator. QuillBot has two versions: premium and free. According to Dale (2020), QuillBot has become a popular free paraphrasing tool. QuillBot provides a solution that uses AI to suggest paraphrases. QuillBot provides a solution that uses AI to suggest paraphrases. AI techniques combine with deep learning and natural language analysis. Words are automatically deleted, added, and changed in order to produce new sentences (Fitria, 2021). Using this tool is simple. QuillBot rewrites text through typing or copying it and clicking the paraphrasing button (Kinga & Gupta, 2021). In addition, high-quality writing must be 100% plagiarism-free before publishing. That is why we need a program that can quickly modify sentences.

Figure 1. *QuillBot logo*

Recently, there has been a growing amount of research on how AI writing tools affect student writing skills, and this research is relevant to the TEFL enterprise. Some research suggests that adopting AI-powered writing tools can help students improve their writing (e.g., Kurniati & Fithriani, 2022; Wang, 2022; Zhao, 2022), while others have voiced concerns about the side effects of these tools (e.g., Y. Liu et al., 2022; Lund & Wang, 2023; Qadir, 2022). The expansion of AI technologies, particularly QuillBot, has introduced new dynamics into education. Despite the increasing popularity of such tools, the effectiveness of QuillBot in enhancing students' writing skills remains uncertain.

This study aims to address this gap by examining the impact of QuillBot specifically in improving argumentative essay writing. Using QuillBot as an alternative method for essay composition, the research employs a quantitative approach to evaluate how this AI tool assists English as a Foreign Language (EFL) students in writing English argumentative essays.

METHOD

This study employs a quasi-experimental design to investigate the impact of AI-powered writing tools, particularly QuillBot, on students' argumentative essay writing skills. As Creswell (2012) defines, a quantitative experimental design examines the relationship between variables and the effects of interventions within a controlled environment. In alignment with Sugiyono (2017), this study applies an experimental approach to evaluate how AI-driven writing assistance influences students' writing proficiency.

This study uses a quasi-experimental pretest-posttest design with a nonequivalent control group

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to assess the impact of AI-powered writing tools on students' writing proficiency. According to Yeaton (2024), quasi-experimental designs provide a structured approach to evaluating causal relationships when randomization is not feasible. In this study, a pre-test was administered before the intervention, followed by a post-test after students in the experimental group were exposed to QuillBot, while the control group continued with conventional writing instruction."

The research design is outlined in Table 1 below, illustrating the structure of the experimental and control groups, along with the pre-test and post-test phases."

Table 1. *The research design is outlined in Table 1 below, illustrating the structure of the experimental and control groups, along with the pre-test and post-test phases*

Group	Pre-Test (O1/O3)	Treatment (X)	Post-Test (O2/O4)
Experimental Group	O1	X	O2
Control Group	O3	-	O4

Explanation:
O1: Pre-test for the Experimental Group.
X: Treatment (use of AI QuillBot) applied to the Experimental Group.
O2: Post-test for the Experimental Group.
O3: Pre-test for the Control Group.
O4: Post-test for the Control Group (without the treatment).

Table 2. *List of participants*

No	Class Name	Semester	Entire Student Population	Samples
1	Class (01)	3rd Semester	30	30
2	Class (02)	3rd Semester	30	30
		Total	60	60

This research study involved a sample of 30 students enrolled in the third semester of the English Language and Culture program. The participants included both male and female students, with an average age range of 19 to 20 years. Their proficiency level was intermediate, as determined by prior assessments that confirmed their ability to comprehend and apply fundamental English concepts and writing patterns. Given the study's focus on exploring specific learning outcomes within a defined group, randomization was deemed impractical. Instead, purposive sampling was employed to select participants who met the study's criteria, ensuring alignment with the research objectives (Andrade, 2021).

Third-semester students were chosen as ideal participants because they had completed foundational coursework, placing them at an intermediate level of English proficiency. This level was critical for the study, as it ensured participants possessed the necessary skills to engage meaningfully with the research tasks. Additionally, purposive sampling allowed the researcher to target a group with shared academic experiences, which was essential for addressing the study's specific aims.

Data were collected from the assignments of two third-semester student classes. The primary method of data collection involved evaluating students' competence in crafting argumentative essays. A rubric-based scoring system was used to assess the essays, focusing on criteria such as argument structure, coherence, and evidence use. Descriptive analysis was employed to summarize the data, including measures of central tendency and variability. After confirming the normality of the data using the Kolmogorov-Smirnov test and homogeneity using Levene's test, hypothesis testing was conducted using the Wilcoxon Signed-Rank Test to compare pre-test and post-test scores in both groups. This approach allowed for a systematic comparison of the two groups' performance.

RESULTS AND DISCUSSION

In this research, two types of data analysis tests were conducted: the normality test and the homogeneity test. These tests were performed to determine whether parametric or non-parametric statistics should be used for inferential analysis. Parametric statistics are applicable when the sample data meet the assumptions of normality and homogeneity. Specifically, the Shapiro-Wilk test was used to assess normality, while Levene's test was employed to evaluate homogeneity. These statistical tests ensured the appropriateness of the chosen analytical methods for the data.

The first step was conducting a normality test on the pretest data from both the control and experimental classes. The purpose of this test was to determine whether the data followed a normal distribution, which would dictate the choice of statistical methods for further analysis. In this study, the Kolmogorov-Smirnov test, performed using SPSS 27.0, was used to assess normality. The results, displayed in the Tests of Normality table under the Sig column, indicated whether the data met the normality assumption. According to the

criteria, a significance value (p-value) greater than 0.05 suggests that the data follows a normal distribution.

Tabel 3. *One-sample Kolmogorov-Smirnov test*

		Pre-test Contro Group	Post-test Control Group	Pre-test Experimental Group	Post-test Experimental Group
N		30	30	30	30
Normal Parameters[a,b]	Mean	60.57	63.97	60.57	72.17
	Std. Deviation	3.451	8.467	3.451	4.857
Most Extreme Differences	Absolute	.399	.153	.399	.472
	Positive	.399	.138	.399	.472
	Negative	-.368	-.153	-.368	-.328
Kolmogorov-Smirnov Z		2.183	.838	2.183	2.587
Asymp. Sig. (2-tailed)		.000	.483	.000	.000

a. Test distribution is Normal.
b. Calculated from data.

According to the One-Sample Kolmogorov-Smirnov Test, the pre-test control group yielded a significance value of 0.000 (α = 0.05), leading to the rejection of the null hypothesis (H0) and acceptance of the alternative hypothesis (H1). This indicates that the pre-test data does not follow a normal distribution. In contrast, the post-test control group data showed a significance value of 0.483 (α = 0.05), suggesting a normal distribution. These results have implications for hypothesis testing: non-normal data requires the use of non-parametric statistical methods, while normally distributed data allows for parametric methods.

Table 4. *Data distribution*

No	Data group	N	Asymp. Sig. (2-tailed)	a	Prerequisite Normality test Sig? 0.05	Conclusion
1	Control Group Pretest	30	0.000	0.05	H0 rejected H1 accepted	Not Normally Distributed
2	Control Group Post test	30	0.483	0.05	H0 accepted H1 rejected	Normally Distributed
3	Experimental Group Pre-test	30	0.000	0.05	H0 rejected H1 accepted	Not Normally Distributed
4	Experimental Gorup Post-test	30	0.000	0.05	H0 rejected H1 accepted	Not Normally Distributed

Assuming that the Sig value is more than α = 0.05, we can conclude that H0 is accepted and H1 is rejected, indicating that the statistical data follows a normal distribution. At a significance threshold of α = 0.05, the experimental group pre-test data produced a Sig value of 0.000. Since the significance value is less than α = 0.05, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted, indicating that the data has non-normal distribution. The observed post-test results of the experimental group yielded a significance value of 0.000 at a significance level of α = 0.05. Since the significance value is less than α = 0.05, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted, indicating that the data has non-normal distribution. From these results, it could be concluded that there is only one instance of normal data, while the other three are not. Considering this basis, the present work is going to use non-parametric statistics for hypothesis testing.

Second, the homogeneity test was conducted on the pretest data of the control and experimental classes. The purpose of this test was to determine whether the variances between the two groups were similar, ensuring comparability for further analysis. The Levene Statistical Test was used with a significance level of α = 0.05. If the significance value exceeded α, the null hypothesis was rejected, indicating unequal variances.

Table 5. *Test of homogenity of variances (Post-test control group*)

Levene Statistic	df1	df2	Sig.
2.014	1	23	.169

Table 6. *Test of homogeneity of variances*

Post-test control Group			
Levene Statistic	df1	df2	Sig.
.536	1	23	.471

Table 7. *Test of homogeneity of variances*

Pree-test Experiment Group			
Levene Statistic	df1	df2	Sig.
.	1	.	.

Table 8. *Test of homogeneity of variances*

Post-test Experiment Group			
Levene Statistic	df1	df2	Sig.
27.429	4	20	.000

The present study included the implementation of a homogeneity test on the pre-test and post-test data of both Experimental Groups. The table displaying the Test of Homogeneity of Variances indicates that the significant difference (Sig) value obtained from comparing the pre-test and post-test of the control group was 0.169, with a significance level of α = 0.05. Therefore, since the Sig value exceeds α = 0.05, we can deduce that H0 is accepted and H1 is rejected, providing proof of homogeneity in the data. Based on a significance level of α = 0.05, the experimental group's pre-test and post-test data showed a Sig value of 0.471.

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Considering the Sig value above $\alpha = 0.05$, we can conclude that H0 is accepted and H1 is rejected, therefore giving evidence of homogeneity in the statistical data.

Considering a significance level of $\alpha = 0.05$, the pre-test data from both the control group and experimental group exhibited a statistically significant zero. Under the condition that the significance level (Sig) is less than $\alpha = 0.05$, the null hypothesis (H0) is rejected in favor of the alternative hypothesis (H1), indicating that the data does not exhibit uniformity. At a significance threshold of $\alpha = 0.05$, the statistical significance (Sig) value for the post-test data in both the control group and experimental group was established as 0.000. With a significance level less than $\alpha = 0.05$, the null hypothesis (H0) is refuted in favor of the alternative hypothesis (H1), indicating that the data is not homogeneous.

Nevertheless, as the data fell short of the requirements for parametric statistical testing, non-parametric approaches were taken. In order to account for the non-normal distribution of the data, the Wilcoxon signed-rank test was used instead of the paired sample t-test.

Table 9. *Wilcoxon signed ranks test*

Group Comparison	Z Value	Asymp. Sig. (2-tailed)	Conclusion
Control Group Post-test Control Group Pre-test	-1.874b	0.061	No significant difference in essay writing ability
Experimental Group Post-test - Experimental Group Pre-test	-4.898b	0.000	Significant improvement in essay writing ability with AI QuillBot

The Wilcoxon test results showed that the control group exhibited no significant improvement in argumentative essay writing (Asymp. Sig. = 0.061, $p > 0.05$). In contrast, the experimental group, which used AI QuillBot, demonstrated a statistically significant improvement (Asymp. Sig. = 0.000, $p < 0.05$). These findings confirm that AI-powered writing tools positively impact students' writing proficiency.

CONCLUSION

This study demonstrates the significant impact of AI-powered writing tools, specifically QuillBot, on improving EFL students' argumentative essay writing skills. The experimental group, which utilized QuillBot, exhibited notable advancements in coherence, argument structure, and grammatical accuracy compared to the control group, which relied solely on traditional writing instruction. The findings highlight that AI-assisted writing tools can effectively address common writing challenges faced by EFL learners, offering instant feedback and facilitating self-revision, which are critical components of the writing development process.

The results suggest that integrating AI writing tools into academic instruction can enhance students' writing proficiency by providing automated corrections and structure refinement. These tools not only assist in minimizing errors but also encourage students to engage in self-directed learning. Given the widespread accessibility of AI-based platforms, educators should consider incorporating such tools into writing curricula to supplement conventional teaching methods. However, it is essential to ensure that students develop critical thinking and originality in their writing, rather than relying entirely on AI-generated suggestions.

Future research should explore the long-term effects of AI-assisted writing on different writing genres and across varying proficiency levels. Additionally, investigating students' perceptions of AI tools in writing development can provide further insights into their effectiveness in educational settings. While AI-powered tools like QuillBot offer significant benefits, they should be integrated thoughtfully, ensuring that students still acquire fundamental writing skills while leveraging technological advancements for enhanced learning outcomes.

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