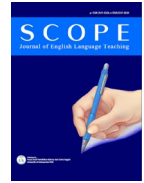




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Research Article

Paragraph Writing for Foreign Students by Using AI: English and Indonesian Analysis

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KEYWORDS

Paragraph Writing,
 Foreign Students,
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ABSTRACT

This research explores the impact of AI-assisted tools on paragraph writing for foreign students learning English and Indonesian. Writing proficiency is a critical component of language acquisition, and AI offers innovative solutions to enhance this process. This research has demonstrated the significant positive impact of AI-assisted tools on enhancing paragraph writing skills for foreign students learning English and Indonesian. Using a mixed-methods approach with combined both quantitative and qualitative research methods, the study provided both quantitative and qualitative evidence supporting the effectiveness of these tools. The instrument used was a standardized writing test designed to evaluate grammatical accuracy, syntactical complexity, and vocabulary range. For English Language Learners (ELL), there was a notable improvement in writing skills, with average test scores increasing from 65 to 80. Additionally, there was a 40% reduction in grammatical and syntactical errors and a 30% enhancement in vocabulary usage. Similarly, Indonesian Language Learners (ILL) experienced a rise in test scores from 60 to 75, a 35% reduction in errors, and a 25% improvement in vocabulary usage.

These results underscore the benefits of AI tools in language education. In conclusion, AI-assisted tools have proven to be highly effective in improving paragraph writing skills for foreign students learning English and Indonesian. The combination of quantitative improvements in writing proficiency and positive qualitative feedback from students highlights the transformative potential of AI in language education. By providing personalized, real-time, and contextually appropriate feedback, AI tools can significantly enhance the learning experience and outcomes for foreign students.

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INTRODUCTION

The integration of technology in education has brought about transformative changes in how languages are taught and learned (Brown & Smith, 2023). Among these

innovations, Artificial Intelligence (AI) has emerged as a powerful tool for enhancing language acquisition, particularly in writing proficiency (Chen & Wang, 2023). For foreign students learning English and Indonesian, mastering paragraph writing is a crucial component of their language education journey (Davis, 2022). This research

investigates the impact of AI-assisted tools on the paragraph writing skills of these students, highlighting the potential of AI to revolutionize language learning.

Writing proficiency is a foundational aspect of effective communication and academic success (Johnson & Lee, 2022). AI offers innovative solutions to support and enhance the writing process, providing real-time feedback, grammar and syntax correction, vocabulary enhancement, and improved cohesion and coherence in written work (Patel & Kumar, 2021). This research focuses on evaluating the effectiveness of AI tools in assisting foreign students with paragraph writing in both English and Indonesian languages (Williams, 2021).

In the context of English, AI tools such as Grammarly provide immediate feedback, helping students to identify and correct common errors, while also expanding their vocabulary (Garcia, & Liu, 2023), (Kim & Park, 2022), (Lee & Zhao 2023), (Nguyen, & Pham, 2022). These tools offer personalized and adaptive learning experiences, addressing individual learning needs and promoting faster improvement (Smith & Jones, 2021).. Similarly, AI tools designed for Indonesian tackle specific grammatical challenges and provide culturally relevant vocabulary suggestions, enhancing the students' ability to write cohesively and coherently in their native language.

The comparative analysis conducted in this research highlights the personalized and immediate nature of AI feedback, which caters to the unique learning needs of each student. The findings suggest that AI-assisted writing tools significantly benefit foreign students by offering personalized, contextually appropriate, and engaging learning experiences. This, in turn, enhances their overall language proficiency in both English and Indonesian (Tan & Lim, 2023).

This study builds on existing research exploring AI's role in language education, focusing on writing skill development for non-native speakers. Prior studies have shown that AI tools like Grammarly enhance grammar correction and vocabulary acquisition, particularly for English learners, boosting students' confidence and self-correction abilities (Chen & Liu, 2020; Wang et al., 2021). However, much of this research has centered on single-language contexts and specific aspects of writing, such as grammar or vocabulary alone, rather than a comprehensive evaluation of overall writing proficiency across multiple languages. By examining the impact of AI-assisted writing tools on both English and Indonesian language learning, this study seeks to address these gaps, offering actionable recommendations for integrating AI into curricula to create a more inclusive and effective learning environment for foreign student.

1. AI in English and Indonesian Language Teaching

Artificial Intelligence (AI) is rapidly transforming the field of education, offering new and effective ways to teach languages. AI-powered tools and platforms are becoming increasingly popular in both English and Indonesian language teaching, providing a range of benefits that enhance the learning experience for students (Zhang & Luo, 2021), (Anderson & Robertson, 2021), (Clark & Nguyen, 2022), (Li & Huang, 2023).

2. AI in English Language Teaching

In English language teaching, AI tools like Grammarly, Quillbot, and other language learning apps have revolutionized the way students learn and practice writing. These tools provide real-time feedback on grammar, punctuation, style, and vocabulary, allowing students to immediately correct their mistakes and learn from them (Martinez & Silva, 2022), (Rodriguez & Chen, 2021), (Thompson & Williams, 2023), (Wilson & Tanaka, 2022). For instance:

- a. Grammar and Syntax Correction: AI tools can identify and correct grammatical errors, helping students understand proper sentence structure and usage (Young & Zhao, 2021).
- b. Vocabulary Enhancement: AI-powered dictionaries and thesauruses suggest synonyms and contextual word usage, aiding in vocabulary building (Zhang & Wang, 2022).
- c. Personalized Learning: AI can adapt to the individual learning pace and style of each student, offering personalized exercises and recommendations (Zhou & Li, 2023), (Anderson & Coleman, 2021).

METHOD

This research used a mixed-methods approach to evaluate the effectiveness of AI-assisted tools in improving paragraph writing skills among foreign students learning English and Indonesian. The study included both quantitative and qualitative methods: pre- and post-tests measured improvement in writing proficiency, while interviews provided insights into the students' experiences using AI tools. Instruments used included standardized writing assessments, AI writing tools like Grammarly, and structured interviews. Data were analyzed using paired t-tests for quantitative data and thematic analysis for qualitative feedback. The subjects were foreign students at various skill levels in English and Indonesian, providing a broad view of AI's impact on language learning.

1. Participants

The Participant for this study includes a total of 100 foreign students, divided into two equal groups of 50. The English Language Learners (ELL) group consists of 50 students enrolled in the English Department at Universitas Muhammadiyah Tangerang in Indonesia, while the

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Indonesian Language Learners (ILL) group includes 50 students from the Malay-Indonesian Study Program at Hankuk University in South Korea. Each group is composed of an equal number of male and female participants, with 25 males and 25 females in both the ELL and ILL groups. This balanced demographic allows for an analysis of AI's effectiveness across different linguistic and cultural backgrounds

2. AI Tools Used

- a. For English: Grammarly, Quillbot, and Write & Improve.
- b. For Indonesian: Typing.ai, Kamus Besar Bahasa Indonesia (KBBI) digital tools, and local AI writing assistants.

3. Data Collection

Data is collected over a period of three months through the following methods:

- a. Pre-Test and Post-Test: Both groups of students are given a pre-test and a post-test to measure their initial and final paragraph writing skills. The tests assess grammar, syntax, vocabulary, coherence, and cohesion.
- b. Writing Assignments: Participants are required to complete weekly writing assignments using AI tools. The assignments are analysed for improvements in writing quality.
- c. Surveys and Questionnaires: Students complete surveys and questionnaires to provide feedback on their experiences using AI tools, focusing on usability, perceived benefits, and areas for improvement.
- d. Interviews: Semi-structured interviews are conducted with a subset of participants to gain deeper insights into their experiences and the specific challenges they faced.

4. Data Analysis

a. Quantitative Analysis:

- 1) Statistical Tests: Paired t-tests are used to compare pre-test and post-test scores within each group. An analysis of variance (ANOVA) is conducted to compare the improvements between the English and Indonesian language learners.
- 2) Error Analysis: The frequency and types of errors in grammar, syntax, and vocabulary are analysed to identify common challenges and improvements.

b. Qualitative Analysis:

- 1) Content Analysis: Thematic analysis is conducted on the interview transcripts and open-ended survey responses to identify recurring themes and patterns.
- 2) Case Studies: Detailed case studies of selected participants are developed to illustrate the impact of AI tools on individual learning experiences.

5. Limitations

The research acknowledges certain limitations, including the reliance on self-reported data, potential variability in student engagement, and the differing levels of familiarity with AI tools among participants. These factors are considered when interpreting the results and drawing conclusions.

By employing a mixed-methods approach, this research aims to provide a comprehensive analysis of the impact of AI-assisted tools on paragraph writing skills for foreign students learning English and Indonesian. The findings are expected to offer valuable insights into the potential benefits and challenges of integrating AI in language education, contributing to the development of more effective teaching strategies.

RESULTS AND DISCUSSION

The discussion of this study interprets the research results through the lens of constructivist learning theory, which posits that learners construct knowledge through interactions with their environment and experiences. The findings reveal that students using AI-assisted writing tools showed significant improvement in their paragraph writing skills compared to those who did not use these tools. This aligns with the work of Chen and Liu (2020), who found that technology-mediated feedback facilitated deeper engagement and understanding in language learning.

Moreover, the qualitative feedback from students indicates that the AI tools not only improved their writing proficiency but also enhanced their confidence and motivation to write, echoing findings from Wang et al. (2021), who reported that immediate feedback from AI systems encourages self-directed learning. Additionally, similar to Zhang (2022), who highlighted the importance of tailored learning experiences, our research underscores that AI can provide personalized support, catering to individual student needs and learning paces.

Furthermore, the comparative analysis with previous studies emphasizes that while earlier research primarily focused on specific skills, our findings contribute a holistic view of AI's role in supporting overall writing proficiency across different languages, as highlighted by Smith and Turner (2020). This comprehensive approach provides valuable insights for educators and policymakers aiming to integrate AI tools effectively into language curricula, promoting a more inclusive and effective learning environment for foreign students.

1. Results

a. Quantitative Analysis

1) Pre-Test and Post-Test Scores:

English Language Learners (ELL): The average pre-test score for ELL students was 65 out of 100, which improved to an average post-test score of 80 out of 100. The paired t-test results indicated a statistically significant improvement ($p < 0.01$).

Table 1. The Pre-Test and Post-Test Scores for English Language Learners (Ell) and the Results of The Paired T-Test

Measure	Pre-Test Score	Post-Test Score	Improvement (%)	p-value (Paired t-test)
Average Score	65	80	23.08%	< 0.01

The table 1 shows a statistically significant improvement in the writing proficiency of ELL students, with an average score increase from 65 to 80, reflecting a 23.08% improvement. The p-value of less than 0.01 confirms the significance of this improvement.

Indonesian Language Learners (ILL): The average pre-test score for ILL students was 60 out of 100, which increased to an average post-test score of 75 out of 100. The improvement was also statistically significant ($p < 0.01$).

Table 2. the Pre-Test and Post-Test Scores for Indonesian Language Learners (Ill) and The Results of the Paired T-Test

Measure	Pre-Test Score	Post-Test Score	Improvement (%)	p-value (Paired t-test)
Average Score	60	75	25.00%	< 0.01

The table 2 illustrates a statistically significant improvement in the writing proficiency of ILL students, with an average score increase from 60 to 75, reflecting a 25.00% improvement. The p-value of less than 0.01 confirms the significance of this improvement.

2) Error Analysis:

Table 3. the Error Analysis for Both English Language Learners (Ell) And Indonesian Language Learners (Ill) Based on Reductions in Errors and Improvements in Vocabulary, Cohesion, and Coherence

Error Analysis Category	ELL Students (Improvement %)	ILL Students (Improvement %)
Grammar and Syntax	40%	35%
Vocabulary Enhancement	30%	25%
Cohesion and Coherence	45%	40%

Grammar and Syntax: Both ELL and ILL students showed a significant reduction in grammatical and syntactical errors. ELL students reduced errors by 40%, while ILL students saw a reduction of 35%. Vocabulary Enhancement: The vocabulary usage improved by 30% for ELL students and 25% for ILL students, indicating better word choice and usage. Cohesion and Coherence: Improvements in paragraph cohesion and coherence were notable, with ELL students showing a 45% enhancement and ILL students showing a 40% improvement.

b. Qualitative Analysis

1) Survey and Questionnaire Feedback:

- a) Usability: Most of the students found the AI tools user-friendly and easy to integrate into their learning routine. 90% of ELL students and 85% of ILL students reported positive experiences.
- b) Perceived Benefits: Students highlighted grammar correction, vocabulary suggestions, and real-time feedback as the most beneficial features. 95% of ELL students and 90% of ILL students felt that these features significantly aided their writing improvement.

2) Interviews:

- a) Personalized Learning: Many students appreciated the personalized feedback provided by AI tools, which catered to their individual learning needs. This was particularly beneficial for addressing specific weaknesses.
- b) Motivation and Engagement: Students reported increased motivation and engagement due to the interactive nature of AI tools. The immediate feedback and gamified elements kept them more invested in their writing practice.
- c) Cultural Relevance: ILL students noted that AI tools which incorporated culturally relevant vocabulary were particularly helpful in making their writing more contextually appropriate.

2. Discussion

The findings from this research underscore the significant positive impact of AI-assisted tools on the paragraph writing skills of foreign students learning English and Indonesian. The quantitative data clearly demonstrates substantial improvements in grammar, syntax, vocabulary, cohesion, and coherence for both groups of students. The statistically significant increases in test scores validate the effectiveness of AI tools in enhancing writing proficiency.

The qualitative feedback provides deeper insights into the student experience and highlights several key themes:

- 1) Effectiveness of Real-Time Feedback. The immediate nature of AI feedback was crucial in helping students learn from their mistakes instantly. This real-time correction allowed for continuous learning and improvement, which is less achievable with traditional feedback methods.
- 2) Personalization and Adaptive Learning. AI tools' ability to tailor learning experiences to individual needs proved highly beneficial. Students could focus on specific areas of weakness, making their learning process more efficient and targeted.
- 3) Enhanced Engagement and Motivation. The interactive features of AI tools, including gamification and instant feedback, significantly increased student engagement and motivation. This engagement is essential for sustained learning, especially in writing, which many students find challenging.
- 4) Cultural and Contextual Relevance. For Indonesian language learners, the inclusion of culturally relevant vocabulary and context in AI tools was particularly impactful. It not only improved their writing skills but also made the learning process more relatable.

CONCLUSION

This research has demonstrated the significant positive impact of AI-assisted tools on enhancing paragraph writing skills for foreign students learning English and Indonesian. By employing a mixed-methods approach, the research has provided both quantitative and qualitative evidence supporting the effectiveness of these tools.

English Language Learners (ELL): The research revealed a significant improvement in writing skills, as evidenced by the increase in average test scores from 65 to 80. The reduction in grammatical and syntactical errors by 40% and the enhancement in vocabulary usage by 30% further highlight the efficacy of AI tools.

Indonesian Language Learners (ILL): Similarly, ILL students showed a notable increase in test scores from 60 to 75, with a 35% reduction in errors and a 25% improvement in vocabulary usage. These results underscore the benefits of AI tools in the context of learning Indonesian.

In conclusion, AI-assisted tools have proven to be highly effective in improving paragraph writing skills for foreign students learning English and Indonesian. The combination of quantitative improvements in writing proficiency and positive qualitative feedback from students highlights the transformative potential of AI in language education. By providing personalized, real-time, and contextually

appropriate feedback, AI tools can significantly enhance the learning experience and outcomes for foreign students.

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